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2011 IEEE/RSJ International Conference on Intelligent Robots and Systems

MoAT1	Continental Parlor 1
Microsensing (Regular Session)	
Chair: Hashimoto, Koichi	Tohoku Univ.
Co-Chair: Arai, Fumihito	Nagoya Univ.

14:00-14:15	MoAT1.1

Evaluation of Biological Clock Activity Capsulated by Lipid-Mono-Layer, pp. 1-6.

Kojima, Masaru (Nagoya Univ.), Nakajima, Masahiro (Nagoya Univ.), Takiguchi, Kingo (Nagoya Univ.), Homma, Michio (Nagoya Univ.), Kondo, Takao (Nagoya Univ.), Fukuda, Toshio (Nagoya Univ.)

14:15-14:30	MoAT1.2

Fast and Adaptive Auto-Focusing for Microscopic Cell Observation, pp. 7-12.

Obara, Takeshi (Tohoku Univ.), Igarashi, Yasunobu (Olympus Software Tech. Corp.), Hashimoto, Koichi (Tohoku Univ.)

14:30-14:45	MoAT1.3

Temperature Measurement by Color Analysis of Fluorescent Spectrum Using Cell Investigation Tool Impregnated with Quantum Dot for Cell Measurement on a Microfluidic Chip, pp. 13-18.

Maruyama, Hisataka (Nagoya Univ.), Tomita, Kyohei (Nagoya Univ.), Masuda, Taisuke (Nagoya Univ.), Arai, Fumihito (Nagoya Univ.)

14:45-14:50	MoAT1.4

Tracking of Objects in Motion-Distorted Scanning Electron Microscope Images, pp. 19-24.

Dahmen, Christian (Univ. of Oldenburg), Fatikow, Sergej (Univ. of Oldenburg)

14:50-14:55	MoAT1.5

Cell Hardness Measurement by Using Two-Fingered Microhand with Micro Force Sensor, pp. 25-30.

Kawakami, Daiki (Osaka Univ.), Ohara, Kenichi (Osaka Univ.), Takubo, Tomohito (Osaka Univ.), Mae, Yasushi (Osaka Univ.), Ichikawa, Akihiko (Nagoya Univ.), Tanikawa, Tamio (National Inst. of AIST), Arai, Tatsuo (Osaka Univ.)

14:55-15:00	MoAT1.6

An Ultra-High Precision, High Bandwidth Torque Sensor for Microrobotics Applications, pp. 31-38.

Finio, Benjamin (Harvard Univ.), Galloway, Kevin (Wyss Inst.), Wood, Robert (Harvard Univ.)

15:00-15:15	MoAT1.7

Nanoforce Estimation with Kalman Filtering Applied to a Force Sensor Based on Diamagnetic Levitation, pp. 39-44.

Piat, Emmanuel (UFC ENSMM), Abadie, Joel (UFC ENSMM), Oster, Stéphane (Femto-st)

15:15-15:30	MoAT1.8

Optimal Design of Non Intuitive Compliant Microgripper with High Resolution, pp. 45-50.

Grira, Aymen (CEA - List (Commisary of Atomic Energy, Paris, France) / and IEM), Legrand, Bernard (IEMN (Inst. of Electronics, Microelectronics and Nanotechnol), Rotinat, Christine (CEA - List (Commissary of Atomic Energy, Fontenay aux Roses, Fra), Mairiaux, Estelle (IEMN (Inst. of Electronics, Microelectronics and Nanotechnol), Buchaillot, Lionel (IEMN (Inst. of Electronics, Microelectronics and Nanotechnol)

MoAT2	Continental Parlor 2
Localization (Regular Session)	
Chair: Tardos, Juan D.	Univ. de Zaragoza
Co-Chair: Franchi, Antonio	Max Planck Inst. for Biological Cybernetics

14:00-14:15	MoAT2.1

Real-Time Loop Detection with Bags of Binary Words, pp. 51-58.

Galvez Lopez, Dorian (Univ. de Zaragoza), Tardos, Juan D. (Univ. de Zaragoza)

14:15-14:30	MoAT2.2

Best-First Branch and Bound Search Method for Map Based Localization, pp. 59-64.

Saarinen, Jari Pekka (Aalto Univ.), Forsman, Pekka (Helsinki Univ. of Tech.), Paanajärvi, Janne Olavi (TKK)

14:30-14:45	MoAT2.3

An Observability-Constrained Sliding Window Filter for SLAM, pp. 65-72.

Huang, Guoquan (Univ. of Minnesota), Mourikis, Anastasios (Univ. of California, Riverside), Roumeliotis, Stergios (Univ. of Minnesota)

14:45-14:50	MoAT2.4

Corrective Gradient Refinement for Mobile Robot Localization, pp. 73-78.

Biswas, Joydeep (Carnegie Mellon Univ.), Coltin, Brian (Carnegie Mellon Univ.), Veloso, Manuela (Carnegie Mellon Univ.)

14:50-14:55	MoAT2.5

A Monocular Vision-Based System for 6D Relative Robot Localization, pp. 79-85. <u>Attachment</u>

Breitenmoser, Andreas (ETH Zurich), Kneip, Laurent (ETHZ), Siegwart, Roland (ETH Zurich)

14:55-15:00	MoAT2.6

Accurate Human Motion Capture in Large Areas by Combining IMU and Laser-Based People Tracking, pp. 86-91.

Ziegler, Jakob (Univ. of Freiburg), Kretzschmar, Henrik (Univ. of Freiburg), Stachniss, Cyrill (Univ. of Freiburg), Grisetti, Giorgio (Sapienza Univ. of Rome), Burgard, Wolfram (Univ. of Freiburg)

15:00-15:15	MoAT2.7

Loop-Closure Candidates Selection by Exploiting Structure in Vehicle Trajectory, pp. 92-97.

Nieto, Juan (Univ. of Sydney, Australian Centre for Field Robotics), Agamennoni, Gabriel (The Univ. of Sydney), Vidal-Calleja, Teresa A. (Univ. of Sydney)

15:15-15:30	MoAT2.8

Optimized Motion Strategies for Localization in Leader-Follower Formations, pp. 98-105.

Zhou, Xun (Univ. of Minnesota), Zhou, Ke (Univ. of Minnesota), Roumeliotis, Stergios (Univ. of Minnesota)

MoAT3	Continental Parlor 3
Symposium: Robot Audition: Active Audition (Invited Session)	
Chair: Danès, Patrick	Univ. de Toulouse ; LAAS-CNRS ; UPS ; F-31077
Co-Chair: Lane, Ian	Carnegie Mellon Univ. Silicon Valley
Organizer: Nakadai, Kazuhiro	Honda Res. Inst. Japan Co., Ltd.
Organizer: Okuno, Hiroshi G.	Kyoto Univ.
Organizer: Danès, Patrick	Univ. de Toulouse ; LAAS-CNRS ; UPS ; F-31077

| Organizer: Lane, Ian | Carnegie Mellon Univ. Silicon Valley |
| Organizer: Ko, Hanseok | Korea Univ. |

| 14:00-14:15 | MoAT3.1 |

Semi-Plenary Invited Talk: An Overview of the BINAAHR Project.*

Danès, Patrick (Univ. de Toulouse ; LAAS-CNRS ; UPS ; F-31077), Okuno, Hiroshi G. (Kyoto Univ.)

| 14:15-14:30 | MoAT3.2 |

Assessment of Single-Channel Ego Noise Estimation Methods (I), pp. 106-111.

Ince, Gokhan (Honda Res. Inst. Japan Co., Ltd.), Nakadai, Kazuhiro (Honda Res. Inst. Japan Co., Ltd.), Rodemann, Tobias (Honda Res. Inst. Europe), Imura, Jun-ichi (Tokyo Inst. of Tech.), Nakamura, Keisuke (Honda Res. Inst. Japan Co., Ltd.), Nakajima, Hirofumi (Honda Res. Inst. Japan Co., Ltd.)

| 14:30-14:45 | MoAT3.3 |

Active Soft Pinnae for Robots (I), pp. 112-117.

Kumon, Makoto (Graduate School of Science and Tech. Kumamoto), Noda, Yoshitaka (Kumamoto Univ.)

| 14:45-14:50 | MoAT3.4 |

Particle-Filter Based Audio-Visual Beat-Tracking for Music Robot Ensemble with Human Guitarist (I), pp. 118-124.

Itohara, Tatsuhiko (Kyoto Univ.), Mizumoto, Takeshi (Kyoto Univ.), Otsuka, Takuma (Kyoto Univ.), Ogata, Tetsuya (Kyoto Univ.), Okuno, Hiroshi G. (Kyoto Univ.)

| 14:50-14:55 | MoAT3.5 |

Optimizing a Reconfigurable Robotic Microphone Array (I), pp. 125-130.

Martinson, Eric (US Naval Res. Lab.), Apker, Thomas (Naval Res. Lab.), Bugajska, Magdalena (Naval Res. Lab.)

| 14:55-15:00 | MoAT3.6 |

Incremental Learning for Ego Noise Estimation of a Robot (I), pp. 131-136.

Ince, Gokhan (Honda Res. Inst. Japan Co., Ltd.), Nakadai, Kazuhiro (Honda Res. Inst. Japan Co., Ltd.), Rodemann, Tobias (Honda Res. Inst. Europe), Imura, Jun-ichi (Tokyo Inst. of Tech.), Nakamura, Keisuke (Honda Res. Inst. Japan Co., Ltd.), Nakajima, Hirofumi (Honda Res. Inst. Japan Co., Ltd.)

| 15:00-15:15 | MoAT3.7 |

Acoustic Models and Kalman Filtering Strategies for Active Binaural Sound Localization (I), pp. 137-142.

Portello, Alban (LAAS-CNRS), Danès, Patrick (Univ. de Toulouse ; LAAS-CNRS ; UPS ; F-31077), Argentieri, Sylvain (Univ. Pierre et Marie Curie; Inst. desSystèmesIntelligen)

| 15:15-15:30 | MoAT3.8 |

Intelligent Sound Source Localization and Its Application to Multimodal Human Tracking (I), pp. 143-148.

Nakamura, Keisuke (Honda Res. Inst. Japan Co., Ltd.), Nakadai, Kazuhiro (Honda Res. Inst. Japan Co., Ltd.), Asano, Futoshi (AIST), Ince, Gokhan (Honda Res. Inst. Japan Co., Ltd.)

MoAT4	Continental Ballroom 4
Symposium: Telerobotics (Invited Session)	
Chair: Peer, Angelika	Tech. Univ. München
Co-Chair: Cavusoglu, M. Cenk	Case Western Res. Univ.
Organizer: Secchi, Cristian	Univ. of Modena & Reggio Emilia
Organizer: Peer, Angelika	Tech. Univ. München
Organizer: Sato, Katsunari	Keio Univ.
Organizer: Cavusoglu, M. Cenk	Case Western Res. Univ.

| 14:00-14:15 | MoAT4.1 |

Semi-Plenary Invited Talk: Development of VGO Robotic Telepresence System.*

Ryden, Thomas (VGO Communications)

| 14:30-14:45 | MoAT4.3 |

Hybrid Virtual-Proxy Based Control Framework for Passive Bilateral Teleoperation Over the Internet (I), pp. 149-156.

Huang, Ke (Univ. of Tennessee), Lee, Dongjun (Univ. of Tennessee-Knoxville)

| 14:45-14:50 | MoAT4.4 |

Mutual Telexistence Surrogate System: TELESAR4 -Telexistence in Real Environments Using Autostereoscopic Immersive Display (I), pp. 157-162. Attachment

Tachi, Susumu (Keio Univ.), Watanabe, Kouichi (Keio Univ.), Takeshita, Keisuke (The Univ. of Tokyo), Minamizawa, Kouta (Keio Univ.), Takumi, Yoshida (The Univ. of Tokyo), Sato, Katsunari (The Univ. of Tokyo)

| 14:50-14:55 | MoAT4.5 |

Experiments of Passivity-Based Bilateral Aerial Teleoperation of a Group of UAVs with Decentralized Velocity Synchronization (I), pp. 163-170. Attachment

Robuffo Giordano, Paolo (Max Planck Inst. for Biological Cybernetics), Franchi, Antonio (Max Planck Inst. for Biological Cybernetics), Secchi, Cristian (Univ. of Modena & Reggio Emilia), Buelthoff, Heinrich H. (Max Planck Inst. for Biol. Cybernetics)

| 14:55-15:00 | MoAT4.6 |

Design of Single-Operator-Multi-Robot Teleoperation Systems with Random Communication Delay, pp. 171-176.

Jia, Yunyi (Michigan State Univ.), Xi, Ning (Michigan State Univ.), Buether, John (Michigan State Univ.)

| 15:00-15:15 | MoAT4.7 |

Network Representation and Passivity of Delayed Teleoperation Systems (I), pp. 177-183.

Artigas, Jordi (DLR - German Aerospace Center), Ryu, Jee-Hwan (Korea Univ. of Tech. and Education), Preusche, Carsten (German Aerospace Center (DLR)), Hirzinger, Gerd (German Aerospace Center (DLR))

| 15:15-15:30 | MoAT4.8 |

Controlling Telerobotic Operations Adaptive to Quality of Teleoperator (QoT), pp. 184-189.

Jia, Yunyi (Michigan State Univ.), Xi, Ning (Michigan State Univ.), Wang, Fei (Northeastern Univ. Shenyang, Liaoning, China), Wang, Yunxia (Michigan State Univ.), Li, Xin (Michigan State Univ.)

MoAT5	Continental Ballroom 5
Symposium: Bio-Inspired Robotics I (Invited Session)	
Chair: Seipel, Justin	Purdue
Co-Chair: Deng, Xinyan	Purdue Univ.
Organizer: Low, K. H.	Nanyang Tech. Univ.
Organizer: Vaidyanathan, Ravi	Imperial Coll. London
Organizer: Deng, Xinyan	Purdue Univ.
Organizer: Seipel, Justin	Purdue

| 14:00-14:15 | MoAT5.1 |

Semi-Plenary Invited Talk: Robustness in Animals As Inspiration for the Next Generation Robot.*

Full, Robert (Univ. of California at Berkeley)

| 14:15-14:30 | MoAT5.2 |

Semi-Plenary Invited Talk: Snake-Inspired Robots.*

Hirose, Shigeo (Tokyo Inst. of Tech.)

14:30-14:45	MoAT5.3

A MATLAB Framework for Efficient Gait Creation (I), pp. 190-196. Attachment

    Remy, C. David (ETH Zurich), Buffinton, Keith (Bucknell Univ.), Siegwart, Roland (ETH Zurich)

14:45-14:50	MoAT5.4

A Controller for Continuous Wave Peristaltic Locomotion (I), pp. 197-202.

    Boxerbaum, Alexander (Case Western Res. Univ.), Horchler, Andrew (Case Western Res. Univ.), Shaw, Kendrick (Case Western Res. Univ.), Chiel, Hillel (Case Western Res. Univ.), Quinn, Roger, D. (Case Western Res. Univ.)

14:50-14:55	MoAT5.5

Energetics of Bio-Inspired Legged Robot Locomotion with Elastically-Suspended Loads (I), pp. 203-208.

    Ackerman, Jeffrey (Purdue Univ.), Seipel, Justin (Purdue)

14:55-15:00	MoAT5.6

A Rapidly Reconfigurable Robot for Assistance in Urban Search and Rescue (I), pp. 209-214.

    Hunt, Alexander J (Case Western Res. Univ.), Bachmann, Richard J. (BioRobots, LLC), Murphy, Robin (Texas A&M), Quinn, Roger, D. (Case Western Res. Univ.)

15:00-15:15	MoAT5.7

Descending Commands to an Insect Leg Controller Network Cause Smooth Behavioral Transitions (I), pp. 215-220. Attachment

    Rutter, Brandon (Case Western Res.), Taylor, Brian (Case Western Res. Univ.), Bender, John (Case Western Res. Univ.), Blumel, Marcus (Univ. of Cologne), Lewinger, William (Case Western Res. Univ.), Ritzmann, Roy Earl (Case Western Res. Univ.), Quinn, Roger, D. (Case Western Res. Univ.)

15:15-15:30	MoAT5.8

Virtual Chassis for Snake Robots (I), pp. 221-226. Attachment

    Rollinson, David (Carnegie Mellon Univ.), Choset, Howie (Carnegie Mellon Univ.)

MoAT6	Continental Ballroom 6
Symposium: Field Robotics I (Invited Session)	
Chair: Tadokoro, Satoshi	Tohoku Univ.
Co-Chair: Anisi, David A.	ABB
Organizer: Tadokoro, Satoshi	Tohoku Univ.
Organizer: Kelly, Alonzo	Carnegie Mellon Univ.

14:00-14:15	MoAT6.1

Semi-Plenary Invited Talk: Rescue Mobile Robot Quince --Toward Emergency Response to the Nuclear Accident at Fukushima Daiichi Nuclear Power Plant on March 2011*.

    Nagatani, Keiji (Tohoku Univ.), Yoshida, Tomoaki (Chiba Inst. of Tech.)

14:30-14:45	MoAT6.3

Perception for a River Mapping Robot (I), pp. 227-234.

    Chambers, Andrew (Carnegie Mellon Univ.), Achar, Supreeth (Carnegie Mellon Univ.), Nuske, Stephen (CMU Robotics Inst.), Rehder, Joern (Hamburg Univ. of Tech.), Kitt, Bernd (Karlsruhe Inst. of Tech.), Chamberlain, Lyle (Carnegie Mellon Univ.), Haines, Justin (Carnegie Mellon Univ.), Scherer, Sebastian (Carnegie Mellon Univ.), Singh, Sanjiv (Carnegie Mellon Univ.)

14:45-14:50	MoAT6.4

Real-World Demonstrations of Sensor-Based Robotic Automation in Oil & Gas Facilities (I), pp. 235-240. Attachment

    Anisi, David A. (ABB), Heyer, Clint (ABB AS), Persson, Erik (ABB)

14:50-14:55	MoAT6.5

Offshore Robotics – Survey, Implementation, Outlook (I), pp. 241-246.

    Pfeiffer, Kai (Fraunhofer IPA), Bengel, Matthias (Fraunhofer IPA), Bubeck, Alexander (Fraunhofer IPA)

14:55-15:00	MoAT6.6

Active Camera Control with Obstacle Avoidance for Remote Operations with Industrial Manipulators: Implementation and Experimental Results (I), pp. 247-254.

    Bjerkeng, Magnus (Norwegian Univ. of Science and Tech.), Transeth, Aksel Andreas (SINTEF ICT), Pettersen, Kristin Y. (Norwegian Univ. of Science and Tech.), Kyrkjebø, Erik (SINTEF ICT), Fjerdingen, Sigurd Aksnes (SINTEF ICT)

15:00-15:15	MoAT6.7

Combining Radar and Vision for Self-Supervised Ground Segmentation in Outdoor Environments, pp. 255-260.

    Milella, Annalisa (Italian National Res. Council (CNR)), Reina, Giulio (Univ. of Salento), Underwood, James Patrick (The Univ. of Sydney), Douillard, Bertrand (Univ. of Syndey)

15:15-15:30	MoAT6.8

Assessing the Deepwater Horizon Oil Spill with the Sentry Autonomous Underwater Vehicle, pp. 261-267.

    Kinsey, James (Woods Hole Oceanographic Inst.), Yoerger, Dana (Woods Hole Oceanographic Inst.), Jakuba, Michael (Univ. of Sydney), Camilli, Richard (Woods Hole Oceanographic Inst.), Fisher, Charles (Pennsylvania State Univ.), German, Christopher R. (Woods Hole Oceanographic Inst.)

MoAT7	Continental Parlor 7
Wheeled Robots (Regular Session)	
Chair: Hirata, Yasuhisa	Tohoku Univ.
Co-Chair: Spenko, Matthew	Illinois Inst. of Tech.

14:00-14:15	MoAT7.1

SO(2) and SO(3), Omni-Directional Personal Mobility with Link-Driven Spherical Wheels, pp. 268-273.

    Ok, Sungsuk (The Univ. of Tokyo), Kodama, Atsushi (The Univ. of Tokyo), Yuma, Matsumura (The Univ. of Tokyo), Nakamura, Yoshihiko (Univ. of Tokyo)

14:15-14:30	MoAT7.2

Design and Control of an Active Anti-Roll System for a Fast Rover, pp. 274-279.

    Krid, Mohamed (Inst. des Systèmes Intelligents et Robotiques), Ben Amar, Faiz (Univ. Pierre et Marie Curie, Paris 6)

14:30-14:45	MoAT7.3

Wheel-Soil Interaction Model for Rover Simulation Based on Plasticity Theory, pp. 280-285.

    Azimi, Ali (McGill Univ.), Kovecses, Jozsef (McGill Univ.), Angeles, Jorge (McGill Univ.)

14:45-14:50	MoAT7.4

Using Unmanned Ground Vehicle Performance Measurements As a Unique Method of Terrain Classification, pp. 286-291.

    Odedra, Siddharth (Middlesex Univ.)

14:50-14:55	MoAT7.5

A Multi-Tiered Robust Steering Controller Based on Yaw Rate and Side Slip Estimation, pp. 292-297.

    Xin, Ming (Univ. of Utah), Minor, Mark (Univ. of Utah)

14:55-15:00	MoAT7.6

Differential Flatness of a Front-Steered Vehicle with Tire Force Control, pp. 298-304.

    Peters, Steven (Massachusetts Inst. of Tech.), Frazzoli, Emilio

(Massachusetts Inst. of Tech.), Iagnemma, Karl (MIT)

15:00-15:15	MoAT7.7

Application of a Diameter-Dependent Terramechanics Model to Small-Wheeled Unmanned Ground Vehicles Operating on Deformable Terrain, pp. 305-310.

Meirion-Griffith, Gareth (Illinois Inst. of Tech.), Spenko, Matthew (Illinois Inst. of Tech.)

15:15-15:30	MoAT7.8

Development of Passive Type Double Wheel Caster Unit Based on Analysis of Feasible Braking Force and Moment Set, pp. 311-317.

Saida, Masao (Tohoku Univ.), Hirata, Yasuhisa (Tohoku Univ.), Kosuge, Kazuhiro (Tohoku Univ.)

MoAT8	Continental Parlor 8

Learning Parameterized Policies (Regular Session)

Chair: Peters, Jan	Darmstadt Univ. of Tech.
Co-Chair: Kormushev, Petar	Istituto Italiano di Tecnologia

14:00-14:15	MoAT8.1

Bipedal Walking Energy Minimization by Reinforcement Learning with Evolving Policy Parameterization, pp. 318-324. Attachment

Kormushev, Petar (Istituto Italiano di Tecnologia), Ugurlu, Barkan (Toyota Tech. Inst.), Calinon, Sylvain (Istituto Italiano di Tecnologia), Tsagarakis, Nikolaos (Istituto Italiano di Tecnologia), Caldwell, Darwin G. (Italian Inst. of Tech.)

14:15-14:30	MoAT8.2

Learning Motion Primitive Goals for Robust Manipulation, pp. 325-331. Attachment

Stulp, Freek (Univ. of Southern California), Theodorou, Evangelos (Univ. of Southern California), Kalakrishnan, Mrinal (Univ. of Southern California), Pastor, Peter (Univ. of Southern California), Righetti, Ludovic (Univ. of Southern California), Schaal, Stefan (Univ. of Southern California)

14:30-14:45	MoAT8.3

Learning Anticipation Policies for Robot Table Tennis, pp. 332-337.

Wang, Zhikun (Max Planck Inst. for Intelligent Systems), Lampert, Christoph H. (Inst. of Science and Tech. Austria), Muelling, Katharina (Max Planck Inst. for Intelligent Systems), Schoelkopf, Bernhard (Max Planck Inst. for Biological Cybernetics), Peters, Jan (Darmstadt Univ. of Tech.)

14:45-14:50	MoAT8.4

Learning Elementary Movements Jointly with a Higher Level Task, pp. 338-343. Attachment

Kober, Jens (Max-Planck Inst. for Intelligent Systems), Peters, Jan (Darmstadt Univ. of Tech.)

14:50-14:55	MoAT8.5

Learning Interaction Control Policies by Demonstration, pp. 344-349.

Koropouli, Vasiliki (Tech. Univ. München), Lee, Dongheui (Tech. Univ. of Munich), Hirche, Sandra (Tech. Univ. München)

14:55-15:00	MoAT8.6

Motion Generation by Reference-Point-Dependent Trajectory HMMs, pp. 350-356. Attachment

Sugiura, Komei (National Inst. of Information and Communications Tech.), Iwahashi, Naoto (National Inst. ofInformationandCommunicationsTechnology), Kashioka, Hideki (NICT, Japan)

15:00-15:15	MoAT8.7

Adapting Control Policies for Expensive Systems to Changing Environments, pp. 357-364.

Tesch, Matthew (Carnegie Mellon Univ.), Schneider, Jeff (Carnegie Mellon Univ.), Choset, Howie (Carnegie Mellon Univ.)

15:15-15:30	MoAT8.8

Online Movement Adaptation Based on Previous Sensor Experiences (I), pp. 365-371. Attachment

Pastor, Peter (Univ. of Southern California), Righetti, Ludovic (Univ. of Southern California), Kalakrishnan, Mrinal (Univ. of Southern California), Schaal, Stefan (Univ. of Southern California)

MoAT9	Continental Parlor 9

Novel Actuators I (Regular Session)

Chair: Huang, Han-Pang	National Taiwan Univ.
Co-Chair: Mascaro, Stephen	Univ. of Utah

14:00-14:15	MoAT9.1

Design of a New Variable Stiffness Actuator and Application for Assistive Exercise Control, pp. 372-377.

Huang, Tzu-Hao (National Taiwan Univ.), Kuan, Jiun-Yih (Massachusetts Inst. of Tech.), Huang, Han-Pang (National Taiwan Univ.)

14:15-14:30	MoAT9.2

A New Variable Stiffness Actuator (CompAct-VSA): Design and Modelling, pp. 378-383. Attachment

Tsagarakis, Nikolaos (Istituto Italiano di Tecnologia), Sardellitti, Irene (Istituto Italiano di Tecnologia), Caldwell, Darwin G. (Italian Inst. of Tech.)

14:30-14:45	MoAT9.3

Optimal Energy Density Piezoelectric Twisting Actuators, pp. 384-389.

Finio, Benjamin (Harvard Univ.), Wood, Robert (Harvard Univ.)

14:45-14:50	MoAT9.4

A Nonlinear Series Elastic Actuator for Highly Dynamic Motions, pp. 390-394. Attachment

Thorson, Ivar (Italian Inst. of Tech.), Caldwell, Darwin G. (Italian Inst. of Tech.)

14:50-14:55	MoAT9.5

Development of a 3-DOF Inchworm Mechanism Organized by a Pair of Y-Shaped Electromagnets and 6 Piezoelectric Actuators -Design, Principle, and Experiments of Translational Motions, pp. 395-401. Attachment

Fuchiwaki, Ohmi (Yokohama National Univ. (YNU)), Yatsurugi, Manabu (Depart of mechanical Engineerign, Yokohama NationalUniversity), Omura, Suguru (Yokohama National Univ.), Arafuka, Kazushi (Yokohama National Univ. (YNU))

14:55-15:00	MoAT9.6

Wet Shape Memory Alloy Actuated Robotic Heart with Thermofluidic Feedback, pp. 402-407.

Pierce, Matthew (Univ. of Utah), Mascaro, Stephen (Univ. of Utah)

15:00-15:15	MoAT9.7

Dielectric Elastomer Bender Actuator Applied to Modular Robotics, pp. 408-413. Attachment

White, Paul (Univ. of Pennsylvania), Latscha, Stella (Univ. of Pennsylvania), Schlaefer, Steven (Univ. of Pennsylvania), Yim, Mark (Univ. of Pennsylvania)

15:15-15:30	MoAT9.8

Stretchable Circuits and Sensors for Robotic Origami, pp. 414-420.

Paik, Jamie (Harvard Univ.), Kramer, Rebecca (Harvard Univ.), Wood, Robert (Harvard Univ.)

MoBT1	Continental Parlor 1

Micromanipulation (Regular Session)

Chair: Arai, Tatsuo	Osaka Univ.

Co-Chair: Abbott, Jake	Univ. of Utah

16:00-16:15	MoBT1.1

Image-Based Magnetic Control of Paramagnetic Microparticles in Water, pp. 421-426.

Keuning, Jasper David (Univ. of Twente), de Vries, Jeroen (MESA+ Inst. for Nanotechnology), Abelmann, Leon (Univ. of Twente), Misra, Sarthak (Univ. of Twente)

16:15-16:30	MoBT1.2

Automated Micromanipulation for a Microhand with All-In-Focus Imaging System, pp. 427-432.

Nguyen, Chanh-Nghiem (Osaka Univ.), Ohara, Kenichi (Osaka Univ.), Avci, Ebubekir (Osaka Univ.), Takubo, Tomohito (Osaka Univ.), Mae, Yasushi (Osaka Univ.), Arai, Tatsuo (Osaka Univ.)

16:30-16:45	MoBT1.3

High Speed Laser Manipulation of On-Chip Fabricated Microstructures by Replacing Solution Inside Microfluidic Channel, pp. 433-438.

Yue, Tao (Nagoya Univ.), Nakajima, Masahiro (Nagoya Univ.), Ito, Masaki (Nagoya Univ.), Kojima, Masaru (Nagoya Univ.), Fukuda, Toshio (Nagoya Univ.)

16:45-16:50	MoBT1.4

Modeling and Design of Magnetic Sugar Particles Manipulation System for Fabrication of Vascular Scaffold, pp. 439-444.

Hu, Chengzhi (Nagoya Univ.), Tercero Villagran, Carlos Rafael (Nagoya Univ.), Ikeda, Seiichi (Nagoya Univ.), Fukuda, Toshio (Nagoya Univ.), Arai, Fumihito (Nagoya Univ.), Negoro, Makoto (Fujita Health Univ.)

16:50-16:55	MoBT1.5

Toward Intuitive Teleoperation of Micro/Nano-Manipulators with Piezoelectric Stick-Slip Actuators, pp. 445-450.

Nambi, Manikantan (Univ. of Utah), Damani, Aayush (Univ. of Utah), Abbott, Jake (Univ. of Utah)

16:55-17:00	MoBT1.6

Pairing and Moving Swarm of Micro Particles into Array with a Robot-Tweezer Manipulation System, pp. 451-456.

Chen, Haoyao (Harbin Inst. of Tech. Shenzhen Graduate School), Sun, Dong (City Univ. of Hong Kong)

17:00-17:15	MoBT1.7

Evaluation and Application of Thermoresponsive Gel Handling towards Manipulation of Single Cells, pp. 457-462.

Takeuchi, Masaru (Nagoya Univ.), Nakajima, Masahiro (Nagoya Univ.), Kojima, Masaru (Nagoya Univ.), Fukuda, Toshio (Nagoya Univ.)

17:15-17:30	MoBT1.8

Comparison on Experimental and Numerical Results for Helical Swimmers Inside Channels, pp. 463-468.

Tabak, Ahmet Fatih (Sabanci Univ.), Temel, Fatma Zeynep (Sabanci Univ.), Yesilyurt, Serhat (Sabanci Univ.)

MoBT2	Continental Parlor 2
Localization with Constraints (Regular Session)	
Chair: Oriolo, Giuseppe	Univ. di Roma
Co-Chair: Stump, Ethan	US Army Res. Lab.

16:00-16:15	MoBT2.1

Mutual Localization Using Anonymous Bearing Measurements, pp. 469-474. Attachment

Stegagno, Paolo (Univ. di Roma "La Sapienza"), Cognetti, Marco (Univ. di Roma "La Sapienza"), Franchi, Antonio (Max Planck Inst. for Biological Cybernetics), Oriolo, Giuseppe (Univ. di Roma "La Sapienza")

16:15-16:30	MoBT2.2

Robust Local Localization for Indoor Environments with Uneven Floors and Inaccurate Maps, pp. 475-481.

Abeles, Peter (Intelligent Automation, Inc.)

16:30-16:45	MoBT2.3

Monte Carlo Localization Using 3D Texture Maps, pp. 482-487.

Fu, Yu (National Taiwan Univ. of Science and Tech.), Tully, Stephen (Carnegie Mellon Univ.), Kantor, George (Carnegie Mellon Univ.), Choset, Howie (Carnegie Mellon Univ.)

16:45-16:50	MoBT2.4

Active Target Localization for Bearing Based Robotic Telemetry, pp. 488-493.

Tokekar, Pratap (Univ. of Minnesota), Vander Hook, Joshua (Univ. of Minnesota), Isler, Volkan (Univ. of Minnesota)

16:50-16:55	MoBT2.5

Orientation Descriptors for Localization in Urban Environments, pp. 494-501.

David, Philip (U.S. Army Res. Lab.), Ho, Sean (Army Res. Lab.)

16:55-17:00	MoBT2.6

A Hybrid Estimation Framework for Cooperative Localization under Communication Constraints, pp. 502-509.

Nerurkar, Esha (Univ. of Minnesota), Zhou, Ke (Univ. of Minnesota), Roumeliotis, Stergios (Univ. of Minnesota)

17:00-17:15	MoBT2.7

Monte Carlo Localization and Registration to Prior Data for Outdoor Navigation, pp. 510-517.

Silver, David (Carnegie Mellon Univ.), Stentz, Anthony (Carnegie Mellon Univ.)

MoBT3	Continental Parlor 3
Symposium: Robot Audition: From Sound Source Localization to Automatic Speech Recognition (Invited Session)	
Chair: Nakadai, Kazuhiro	Honda Res. Inst. Japan Co., Ltd.
Co-Chair: Okuno, Hiroshi G.	Kyoto Univ.
Organizer: Nakadai, Kazuhiro	Honda Res. Inst. Japan Co., Ltd.
Organizer: Okuno, Hiroshi G.	Kyoto Univ.
Organizer: Danès, Patrick	Univ. de Toulouse ; LAAS-CNRS ; UPS ; F-31077
Organizer: Lane, Ian	Carnegie Mellon Univ. Silicon Valley
Organizer: Ko, Hanseok	Korea Univ.

16:00-16:15	MoBT3.1

Semi-Plenary Invited Talk: Real-Time Large Vocabulary Conversational Speech Recognition for Robust Human-Robot Interaction.

Lane, Ian (Carnegie Mellon Univ. Silicon Valley)

16:15-16:30	MoBT3.2

Semi-Plenary Invited Talk: Recent Advances on Noise Reduction and Source Separation Technology for Robot Audition.

Saruwatari, Hiroshi (Nara Inst. of Science and Tech.)

16:30-16:45	MoBT3.3

Variable Frame Rate Hierarchical Analysis for Robust Speech Recognition (I), pp. 518-523.

Rouat, Jean (Univ. de Sherbrooke), Loiselle, Stéphane (Univ. de Sherbrooke), Molotchnikoff, Stéphane (Univ. de Montréal)

16:45-16:50	MoBT3.4

SLAM-Based Online Calibration of Asynchronous Microphone Array for Robot Audition (I), pp. 524-529.

Miura, Hiroki (Tokyo Inst. of Tech.), Yoshida, Takami (Tokyo Inst. of Tech.), Nakamura, Keisuke (Honda Res. Inst. Japan Co., Ltd.), Nakadai, Kazuhiro (Honda Res. Inst. Japan Co., Ltd.)

16:50-16:55	MoBT3.5

HARK Based Real-Time Single Pane 3D Auditory Scene Visualizer Empowered by Speech Arrow (I), pp. 530-535.

Gong, Zheng (Tokyo Inst. of Tech.), Nakadai, Kazuhiro (Honda Res. Inst. Japan Co., Ltd.), Nakajima, Hirofumi (Honda Res. Inst. Japan Co., Ltd.), Hagiwara, Ichiro (Tokyo Inst. of Tech.)

16:55-17:00	MoBT3.6

Multi-Modal Front-End for Speaker Activity Detection in Small Meetings (I), pp. 536-541.

Even, Jani (ATR), Heracleous, Panikos (ATR Intelligent Robotics and Communication Lab.), Ishi, Carlos Toshinori (ATR), Hagita, Norihiro (ATR)

17:00-17:15	MoBT3.7

A Scene-Associated Training Method for Mobile Robot Speech Recognition in Multisource Reverberated Environments (I), pp. 542-549.

Liu, Jindong (Imperial Coll. London), Johns, Edward (Imperial Coll. London), Yang, Guang-Zhong (Imperial Coll. London)

17:15-17:30	MoBT3.8

The Effects of Microphone Array Processing on Pitch Extraction in Real Noisy Environments (I), pp. 550-555.

Ishi, Carlos Toshinori (ATR), Liang, Dong (Osaka Univ.), Ishiguro, Hiroshi (Osaka Univ.), Hagita, Norihiro (ATR)

MoBT5	Continental Ballroom 5

Symposium: Bio-Inspired Robotics II (Invited Session)

Chair: Low, K. H.	Nanyang Tech. Univ.
Co-Chair: Vaidyanathan, Ravi	Imperial Coll. London
Organizer: Low, K. H.	Nanyang Tech. Univ.
Organizer: Vaidyanathan, Ravi	Imperial Coll. London
Organizer: Deng, Xinyan	Purdue Univ.
Organizer: Seipel, Justin	Purdue

16:00-16:15	MoBT5.1

Semi-Plenary Invited Talk: Robotics at Boston Dynamics*.

Nelson, Gabriel (Boston Dynamics)

16:15-16:30	MoBT5.2

Semi-Plenary Invited Talk: Progress on 100 Milligram Robotic Insects*.

Wood, Robert (Harvard Univ.)

16:30-16:45	MoBT5.3

Design of a Miniature Integrated Multi-Modal Jumping and Gliding Robot (I), pp. 556-561.

Woodward, Matthew (Carnegie Mellon Univ.), Sitti, Metin (Carnegie Mellon Univ.)

16:45-16:50	MoBT5.4

ScarlETH: Design and Control of a Planar Running Robot (I), pp. 562-567. Attachment

Hutter, Marco (ETH Zurich), Remy, C. David (ETH Zurich), Hoepflinger, Mark (ETH Zurich), Siegwart, Roland (ETH Zurich)

16:50-16:55	MoBT5.5

Modeling and Control on Hysteresis Nonlinearity in Biorobotic Undulating Fins (I), pp. 568-573.

Hu, Tianjiang (National Univ. of Defense Tech.), Zhu, Huayong (NUDT), Han, Zhou (NUDT), Low, K. H. (Nanyang Tech. Univ.), Shen, Lincheng (National Univ. of Defense Tech.)

16:55-17:00	MoBT5.6

Translational Damping on Flapping Cicada Wings (I), pp. 574-579.

Parks, Perry (Purdue Univ.), Cheng, Bo (Purdue Univ.), Hu, Zheng (Univ. of Delaware), Deng, Xinyan (Purdue Univ.)

17:00-17:15	MoBT5.7

Biologically Derived Models of the Sunfish for Experimental Investigations of Multi-Fin Swimming (I), pp. 580-587.

Tangorra, James (Drexel Univ.), Mignano, Anthony (Drexel Univ.), Carryon, Gabe (Drexel), Kahn, Jeff (Drexel Univ.)

17:15-17:30	MoBT5.8

Dynamic Modeling of Robotic Fish and Its Experimental Validation (I), pp. 588-594.

Wang, Jianxun (Michigan State Univ.), Alequin-Ramos, Freddie (Michigan State Univ.), Tan, Xiaobo (Michigan State Univ.)

MoBT6	Continental Ballroom 6

Symposium: Field Robotics II (Invited Session)

Chair: Anisi, David A.	ABB
Co-Chair: Tadokoro, Satoshi	Tohoku Univ.
Organizer: Tadokoro, Satoshi	Tohoku Univ.
Organizer: Kelly, Alonzo	Carnegie Mellon Univ.

16:00-16:15	MoBT6.1

Semi-Plenary Invited Talk: Recent Developments in Robotics Technology and Flight Implementation at JPL*.

Volpe, Richard (Jet Propulsion Lab. Caltech)

16:15-16:30	MoBT6.2

On On-Orbit Passive Object Handling by Cooperating Space Robotic Servicers, pp. 595-600.

Rekleitis, Georgios (National Tech. Univ. of Athens), Papadopoulos, Evangelos (National Tech. Univ. of Athens)

16:30-16:45	MoBT6.3

Path Planning and Evaluation for Planetary Rovers Based on Dynamic Mobility Index, pp. 601-606. Attachment

Ishigami, Genya (Japan Aerospace Exploration Agency (JAXA)), Nagatani, Keiji (Tohoku Univ.), Yoshida, Kazuya (Tohoku Univ.)

16:45-16:50	MoBT6.4

Control of a Passively Steered Rover Using 3-D Kinematics, pp. 607-612.

Seegmiller, Neal Andrew (Carnegie Mellon Univ.), Wettergreen, David (Carnegie Mellon Univ.)

16:50-16:55	MoBT6.5

Optical Flow Odometry with Robustness to Self-Shadowing, pp. 613-618.

Seegmiller, Neal Andrew (Carnegie Mellon Univ.), Wettergreen, David (Carnegie Mellon Univ.)

16:55-17:00	MoBT6.6

Vision-Based Space Autonomous Rendezvous : A Case Study, pp. 619-624. Attachment

Petit, Antoine (IRISA/INRIA Rennes-Bretagne Atlantique), Marchand, Eric (Univ. de Rennes 1, IRISA, INRIA Rennes), Kanani, Keyvan (EADS Astrium)

17:00-17:15	MoBT6.7

Time-Optimal Detumbling Maneuver Along an Arbitrary Arm Motion During the Capture of a Target Satellite, pp. 625-630.

Oki, Tomohisa (MDA Space Missions), Abiko, Satoko (Tohoku Univ.), Nakanishi, Hiroki (Japan Aerospace Exploration Agency), Yoshida, Kazuya (Tohoku Univ.)

3D SLAM for Planetary Worksite Mapping, pp. 631-638.

Tong, Chi Hay (Univ. of Toronto), Barfoot, Timothy (Univ. of Toronto), Dupuis, Erick (Canadian Space Agency)

MoBT7   Continental Parlor 7

Teleoperation (Regular Session)

Chair: Chopra, Nikhil	Univ. of Maryland, Coll. Park
Co-Chair: van der Smagt, Patrick	DLR

16:00-16:15   MoBT7.1

A Constrained Optimization Approach to Virtual Fixtures for Multi-Robot Collaborative Teleoperation, pp. 639-644.

Xia, Tian (Johns Hopkins Univ. Lab. for Computational Sensing a), Kapoor, Ankur (National Inst. of Health), Kazanzides, Peter (Johns Hopkins Univ.), Taylor, Russell H. (The Johns Hopkins Univ.)

16:15-16:30   MoBT7.2

A Task-Space Weighting Matrix Approach to Semi-Autonomous Teleoperation Control, pp. 645-652.

Malysz, Pawel (McMaster Univ.), Sirouspour, Shahin (McMaster Univ.)

16:30-16:45   MoBT7.3

Small Gain Design of Cooperative Teleoperator System with Projection-Based Force Reflection, pp. 653-658.

Polushin, Ilia G. (The Univ. of Western Ontario), Takhmar, Amir (Univ. of Western Ontario), Patel, Rajnikant V. (The Univ. of Western Ontario)

16:45-16:50   MoBT7.4

An Enhanced Sliding-Mode Control for a Pneumatic-Actuated Teleoperation System, pp. 659-664.

Le, Minh-Quyen (INSA de Lyon), Pham, Minh Tu (INSA de Lyon (Inst. National des Sciences Appliquees)), Tavakoli, Mahdi (Univ. of Alberta), Moreau, Richard (INSA-Lyon)

16:50-16:55   MoBT7.5

Subspace-Oriented Energy Distribution for the Time Domain Passivity Approach, pp. 665-671. Attachment

Ott, Christian (German Aerospace Center (DLR)), Artigas, Jordi (DLR - German Aerospace Center), Preusche, Carsten (German Aerospace Center (DLR))

16:55-17:00   MoBT7.6

EMG-Based Teleoperation and Manipulation with the DLR LWR-III, pp. 672-678. Attachment

Vogel, Joern (German Aerospace Center), Castellini, Claudio (DLR - German Aerospace Res. Center), van der Smagt, Patrick (DLR)

17:00-17:15   MoBT7.7

Semi-Autonomous Teleoperation in Task Space with Redundant Slave Robot under Communication Delays, pp. 679-684.

Liu, Yen-Chen (Univ. of Maryland, Coll. Park), Chopra, Nikhil (Univ. of Maryland, Coll. Park)

17:15-17:30   MoBT7.8

Noninvasive Brain-Computer Interface-Based Control of Humanoid Navigation, pp. 685-691.

Chae, Yongwook (Korea Advanced Inst. of Science & Tech. (KAIST)), Jeong, Jaeseung (Korea Advanced Inst. of Science and Tech. (KAIST)), Jo, Sungho (Korea Advanced Inst. of Science and Tech. (KAIST))

MoBT8   Continental Parlor 8

Learning for Control (Regular Session)

Chair: Nakanishi, Jun	Univ. of Edinburgh
Co-Chair: Conradt, Jorg	Tech. Univ. München

16:00-16:15   MoBT8.1

Adding a Receding Horizon to Locally Weighted Regression for Learning Robot Control, pp. 692-697.

Lehnert, Christopher (The Univ. of Queensland), Wyeth, Gordon (Queensland Univ. of Tech.)

16:15-16:30   MoBT8.2

Learning Inverse Kinematics with Structured Prediction, pp. 698-703.

Bocsi, Botond (Babes Bolyai Univ.), Nguyen-Tuong, Duy (Max Planck Inst. for Biological Cybernetics), Csató, Lehel (Babes Bolyai Univ.), Schoelkopf, Bernhard (Max Planck Inst. for Biological Cybernetics), Peters, Jan (Darmstadt Univ. of Tech.)

16:30-16:45   MoBT8.3

Learning Task-Space Tracking Control with Kernels, pp. 704-709.

Nguyen-Tuong, Duy (Max Planck Inst. for Biological Cybernetics), Peters, Jan (Darmstadt Univ. of Tech.)

16:45-16:50   MoBT8.4

Learning to Control Planar Hitting Motions in a Minigolf-Like Task, pp. 710-717. Attachment

Kronander, Klas (Learning Algorithms and Systems Lab. EPFL), Khansari-Zadeh, Seyed Mohammad (EPFL), Billard, Aude (EPFL)

16:50-16:55   MoBT8.5

Stiffness and Temporal Optimization in Periodic Movements: An Optimal Control Approach, pp. 718-724. Attachment

Nakanishi, Jun (Univ. of Edinburgh), Rawlik, Konrad (Univ. of Edinburgh), Vijayakumar, Sethu (Univ. of Edinburgh)

16:55-17:00   MoBT8.6

Improving Operational Space Control of Heavy Manipulators Via Open-Loop Compensation, pp. 725-731.

Maeda, Guilherme Jorge (The Univ. of Sydney), Singh, Surya (Univ. of Sydney), Rye, David (The Univ. of Sydney)

17:00-17:15   MoBT8.7

Behavioural Cloning for Driving Robots Over Rough Terrain, pp. 732-737.

Sheh, Raymond Ka-Man (The Univ. of New South Wales), Hengst, Bernhard (Univ. of New South Wales), Sammut, Claude (The Univ. of New South Wales)

MoBT9   Continental Parlor 9

Novel Actuators II (Regular Session)

Chair: Onal, Cagdas Denizel	Massachusetts Inst. of Tech.
Co-Chair: Fuchiwaki, Ohmi	Yokohama National Univ. (YNU)

16:00-16:15   MoBT9.1

Sliding-Mode Control of Nonlinear Discrete-Input Pneumatic Actuators, pp. 738-743.

Hodgson, Sean (Univ. of Alberta), Le, Minh-Quyen (INSA de Lyon), Tavakoli, Mahdi (Univ. of Alberta), Pham, Minh Tu (INSA de Lyon (Inst. National des Sciences Appliquees))

16:15-16:30   MoBT9.2

Trajectory Planning and Current Control Optimization of Three Degree-Of-Freedom Spherical Actuator, pp. 744-749.

Zhang, Liang (Beihang Univ.), Chen, Weihai (Beijing Univ. of Aeronaurics and Astronautics), Yan, Liang (Nanyang Tech. Univ.), Liu, Jingmeng (Beihang Univ.)

16:30-16:45   MoBT9.3

Development of a Miniature Foil Type Ultrasonic Motor, pp. 750-755.

Okamoto, Jun (Tokyo Women's Medical Univ.), Toyama, Shigeki (TUAT)

16:45-16:50   MoBT9.4

Soft Robot Actuators Using Energy-Efficient Valves Controlled by Electropermanent Magnets, pp. 756-761. Attachment

Marchese, Andrew (Massachusetts Inst. of Tech.), Onal, Cagdas Denizel (Massachusetts Inst. of Tech.), Rus, Daniela (MIT)

16:50-16:55   MoBT9.5

Synthesis of a Non-Circular Cable Spool to Realize a Nonlinear Rotational Spring, pp. 762-767. Attachment

Schmit, Nicolas (Tokyo Inst. of Tech.), Okada, Masafumi (Tokyo Inst. of Tech.)

16:55-17:00   MoBT9.6

Avoiding Joint Limits with a Low-Level Fusion Scheme, pp. 768-773. Attachment

Kermorgant, Olivier (INRIA Rennes-Bretagne Atlantique), Chaumette, Francois (INRIA Rennes-Bretagne Atlantique)

17:00-17:15   MoBT9.7

Variable Impedance Due to Electromechanical Coupling in Electroactive Polymer Actuators, pp. 774-779.

Dastoor, Sanjay (Stanford Univ.), Cutkosky, Mark (Stanford Univ.)

17:15-17:30   MoBT9.8

Optimal Control of Multi-Input SMA Actuator Arrays Using Graph Theory - Expanding Wavefront and Simultaneous Operations, pp. 780-785.

Flemming, Leslie (The Univ. of Utah), Mascaro, Stephen (Univ. of Utah), Johnson, David (Univ. of Utah)

MoBPT10   Golden Gate Room

Interactive I (Interactive Session)

16:00-17:30   MoBPT10.1

Tracking of Objects in Motion-Distorted Scanning Electron Microscope Images*.

Dahmen, Christian (Univ. of Oldenburg), Fatikow, Sergej (Univ. of Oldenburg)

16:00-17:30   MoBPT10.2

Cell Hardness Measurement by Using Two-Fingered Microhand with Micro Force Sensor*.

Kawakami, Daiki (Osaka Univ.), Ohara, Kenichi (Osaka Univ.), Takubo, Tomohito (Osaka Univ.), Mae, Yasushi (Osaka Univ.), Ichikawa, Akihiko (Nagoya Univ.), Tanikawa, Tamio (National Inst. of AIST), Arai, Tatsuo (Osaka Univ.)

16:00-17:30   MoBPT10.3

An Ultra-High Precision, High Bandwidth Torque Sensor for Microrobotics Applications*.

Finio, Benjamin (Harvard Univ.), Galloway, Kevin (Wyss Inst.), Wood, Robert (Harvard Univ.)

16:00-17:30   MoBPT10.4

Corrective Gradient Refinement for Mobile Robot Localization*.

Biswas, Joydeep (Carnegie Mellon Univ.), Coltin, Brian (Carnegie Mellon Univ.), Veloso, Manuela (Carnegie Mellon Univ.)

16:00-17:30   MoBPT10.5

A Monocular Vision-Based System for 6D Relative Robot Localization*.

Breitenmoser, Andreas (ETH Zurich), Kneip, Laurent (ETHZ), Siegwart, Roland (ETH Zurich)

16:00-17:30   MoBPT10.6

Accurate Human Motion Capture in Large Areas by Combining IMU and Laser-Based People Tracking*.

Ziegler, Jakob (Univ. of Freiburg), Kretzschmar, Henrik (Univ. of Freiburg), Stachniss, Cyrill (Univ. of Freiburg), Grisetti, Giorgio (Sapienza Univ. of Rome), Burgard, Wolfram (Univ. of Freiburg)

16:00-17:30   MoBPT10.7

Particle-Filter Based Audio-Visual Beat-Tracking for Music Robot Ensemble with Human Guitarist (I)*.

Itohara, Tatsuhiko (Kyoto Univ.), Mizumoto, Takeshi (Kyoto Univ.), Otsuka, Takuma (Kyoto Univ.), Ogata, Tetsuya (Kyoto Univ.), Okuno, Hiroshi G. (Kyoto Univ.)

16:00-17:30   MoBPT10.8

Optimizing a Reconfigurable Robotic Microphone Array (I)*.

Martinson, Eric (US Naval Res. Lab.), Apker, Thomas (Naval Res. Lab.), Bugajska, Magdalena (Naval Res. Lab.)

16:00-17:30   MoBPT10.9

Incremental Learning for Ego Noise Estimation of a Robot (I)*.

Ince, Gokhan (Honda Res. Inst. Japan Co., Ltd.), Nakadai, Kazuhiro (Honda Res. Inst. Japan Co., Ltd.), Rodemann, Tobias (Honda Res. Inst. Europe), Imura, Jun-ichi (Tokyo Inst. of Tech.), Nakamura, Keisuke (Honda Res. Inst. Japan Co., Ltd.), Nakajima, Hirofumi (Honda Res. Inst. Japan Co., Ltd.)

16:00-17:30   MoBPT10.10

Mutual Telexistence Surrogate System: TELESAR4 -Telexistence in Real Environments Using Autostereoscopic Immersive Display (I)*.

Tachi, Susumu (Keio Univ.), Watanabe, Kouichi (Keio Univ.), Takeshita, Keisuke (The Univ. of Tokyo), Minamizawa, Kouta (Keio Univ.), Takumi, Yoshida (The Univ. of Tokyo), Sato, Katsunari (Keio Univ.)

16:00-17:30   MoBPT10.11

Experiments of Passivity-Based Bilateral Aerial Teleoperation of a Group of UAVs with Decentralized Velocity Synchronization (I)*.

Robuffo Giordano, Paolo (Max Planck Inst. for Biological Cybernetics), Franchi, Antonio (Max Planck Inst. for Biological Cybernetics), Secchi, Cristian (Univ. of Modena & Reggio Emilia), Buelthoff, Heinrich H. (Max Planck Inst. for Biol. Cybernetics)

16:00-17:30   MoBPT10.12

Design of Single-Operator-Multi-Robot Teleoperation Systems with Random Communication Delay*.

Jia, Yunyi (Michigan State Univ.), Xi, Ning (Michigan State Univ.), Buether, John (Michigan State Univ.)

16:00-17:30   MoBPT10.13

A Controller for Continuous Wave Peristaltic Locomotion (I)*.

Boxerbaum, Alexander (Case Western Res. Univ.), Horchler, Andrew (Case Western Res. Univ.), Shaw, Kendrick (Case Western Res. Univ.), Chiel, Hillel (Case Western Res. Univ.), Quinn, Roger, D. (Case Western Res. Univ.)

16:00-17:30   MoBPT10.14

Energetics of Bio-Inspired Legged Robot Locomotion with Elastically-Suspended Loads (I)*.

Ackerman, Jeffrey (Purdue Univ.), Seipel, Justin (Purdue)

16:00-17:30   MoBPT10.15

A Rapidly Reconfigurable Robot for Assistance in Urban Search and Rescue (I)*.

Hunt, Alexander J (Case Western Res. Univ.), Bachmann, Richard J. (BioRobots, LLC), Quinn, Roger, D. (Case Western Res. Univ.)

16:00-17:30   MoBPT10.16

Real-World Demonstrations of Sensor-Based Robotic Automation in Oil & Gas Facilities (I)*.

Anisi, David A. (ABB), Heyer, Clint (ABB AS), Persson, Erik (ABB), Skourup, Charlotte (ABB)

16:00-17:30	MoBPT10.17

*Offshore Robotics – Survey, Implementation, Outlook (I)**.

Pfeiffer, Kai (Fraunhofer IPA), Bengel, Matthias (Fraunhofer IPA), Bubeck, Alexander (Fraunhofer IPA)

16:00-17:30	MoBPT10.18

*Active Camera Control with Obstacle Avoidance for Remote Operations with Industrial Manipulators: Implementation and Experimental Results (I)**.

Bjerkeng, Magnus (Norwegian Univ. of Science and Tech.), Transeth, Aksel Andreas (SINTEF ICT), Pettersen, Kristin Y. (Norwegian Univ. of Science and Tech.), Kyrkjebø, Erik (SINTEF ICT), Fjerdingen, Sigurd Aksnes (SINTEF ICT)

16:00-17:30	MoBPT10.19

*Using Unmanned Ground Vehicle Performance Measurements As a Unique Method of Terrain Classification**.

Odedra, Siddharth (Middlesex Univ.)

16:00-17:30	MoBPT10.20

*A Multi-Tiered Robust Steering Controller Based on Yaw Rate and Side Slip Estimation**.

Xin, Ming (Univ. of Utah), Minor, Mark (Univ. of Utah)

16:00-17:30	MoBPT10.21

*Differential Flatness of a Front-Steered Vehicle with Tire Force Control**.

Peters, Steven (Massachusetts Inst. of Tech.), Frazzoli, Emilio (Massachusetts Inst. of Tech.), Iagnemma, Karl (MIT)

16:00-17:30	MoBPT10.22

*Learning Elementary Movements Jointly with a Higher Level Task**.

Kober, Jens (Max-Planck Inst. for Intelligent Systems), Peters, Jan (Darmstadt Univ. of Tech.)

16:00-17:30	MoBPT10.23

*Learning Interaction Control Policies by Demonstration**.

Koropouli, Vasiliki (Tech. Univ. München), Lee, Dongheui (Tech. Univ. of Munich), Hirche, Sandra (Tech. Univ. München)

16:00-17:30	MoBPT10.24

*Motion Generation by Reference-Point-Dependent Trajectory HMMs**.

Sugiura, Komei (National Inst. of Information and Communications Tech.), Iwahashi, Naoto (National Inst. ofInformationandCommunicationsTechnology), Kashioka, Hideki (NICT, Japan)

16:00-17:30	MoBPT10.25

*A Nonlinear Series Elastic Actuator for Highly Dynamic Motions**.

Thorson, Ivar (Istituto Italiano di Tecnologia), Caldwell, Darwin G. (Italian Inst. of Tech.)

16:00-17:30	MoBPT10.26

*Development of a 3-DOF Inchworm Mechanism Organized by a Pair of Y-Shaped Electromagnets and 6 Piezoelectric Actuators -Design, Principle, and Experiments of Translational Motions**.

Fuchiwaki, Ohmi (Yokohama National Univ. (YNU)), Yatsurugi, Manabu (Depart of mechanical Engineerign, Yokohama NationalUniversity), Omura, Suguru (Yokohama National Univ.), Arafuka, Kazushi (Yokohama National Univ. (YNU))

16:00-17:30	MoBPT10.27

*Wet Shape Memory Alloy Actuated Robotic Heart with Thermofluidic Feedback**.

Pierce, Matthew (Univ. of Utah), Mascaro, Stephen (Univ. of Utah)

TuAT1	Continental Parlor 1
Object Recognition, Segmentation, and Detection (Regular Session)	

Chair: Darrell, Trevor	UC Berkeley
Co-Chair: Tews, Ashley Desmond	CSIRO

08:00-08:15	TuAT1.1

Robust Stereo-Vision Based 3D Modelling of Real-World Objects for Assistive Robotic Applications, pp. 786-792.

Natarajan, Saravana K. (Univ. of Bremen, Inst. of Automation), Ristic-Durrant, Danijela (Univ. of Bremen), Leu, Adrian (Univ. of Bremen), Gräser, Axel (Univ. of Bremen)

08:15-08:30	TuAT1.2

Practical 3-D Object Detection Using Category and Instance-Level Appearance Models, pp. 793-800.

Saenko, Kate (ICSI & UC Berkeley EECS), Jia, Yangqing (UC Berkeley), Fritz, Mario (Max-Planck-Inst. for Informatics), Long, Jonathan (Univ. of California - Berkeley), Janoch, Allison (UC Berkeley), Shyr, Alex (UC Berkeley), Karayev, Sergey (UC Berkeley), Darrell, Trevor (UC Berkeley)

08:30-08:45	TuAT1.3

Integrate Multi-Modal Cues for Category-Independent Object Detection and Localization, pp. 801-806.

Zhang, Jianhua (Univ. of Hamburg), Xiao, Junhao (Univ. of Hamburg), Zhang, Jianwei (Univ. of Hamburg), Zhang, Houxiang (Computer Science), Chen, S.Y. (Imperial Coll. London)

08:45-08:50	TuAT1.4

Visual and Physical Segmentation of Novel Objects, pp. 807-812.

Almaddah, Amr (Osaka Univ.), Mae, Yasushi (Osaka Univ.), Ohara, Kenichi (Osaka Univ.), Takubo, Tomohito (Osaka Univ.), Arai, Tatsuo (Osaka Univ.)

08:50-08:55	TuAT1.5

Knowing Your Limits – Self-Evaluation and Prediction in Object Recognition, pp. 813-820.

Zillich, Michael (Vienna Univ. of Tech.), Prankl, Johann (Univ. of Tech. Vienna), Mörwald, Thomas (Vienna Univ. of Tech.), Vincze, Markus (Vienna Univ. of Tech.)

08:55-09:00	TuAT1.6

Depth Kernel Descriptors for Object Recognition, pp. 821-826.

Bo, Liefeng (Univ. of Washington), Ren, Xiaofeng (Intel Lab.), Fox, Dieter (Univ. of Washington)

09:00-09:15	TuAT1.7

Generating Object Hypotheses in Natural Scenes through Human-Robot Interaction, pp. 827-833. Attachment

Bergström, Niklas (KTH), Björkman, Mårten (KTH), Kragic, Danica (KTH)

09:15-09:30	TuAT1.8

3D Payload Detection from 2D Range Scans, pp. 834-840.

Tews, Ashley Desmond (CSIRO)

TuAT2	Continental Parlor 2
Simultaneous Localization and Mapping (Regular Session)	

Chair: Valls Miro, Jaime	Univ. of Tech. Sydney
Co-Chair: Wolf, Denis Fernando	Univ. of Sao Paulo

08:00-08:15	TuAT2.1

A Hierarchical RBPF SLAM for Mobile Robot Coverage in Indoor Environments, pp. 841-846.

Lee, Tae-kyeong (Pohang Univ. of Science and Tech.), Lee, Seongsoo (LG Electronics Corp.), Oh, Se-Young (POSTECH)

08:15-08:30	TuAT2.2

Mapping of Multi-Floor Buildings: A Barometric Approach, pp. 847-852.

Özkil, Ali Gürcan (Tech. Univ. of Denmark), Dawids, Steen (DTU, Tech. Univ. of Denmark), Jens, Kristensen (FORCE Tech.), Christensen, Kim Hardam (Force Tech. Denmark), Fan, Zhun (Tongji Univ.)

08:30-08:45	TuAT2.3

Multiple Robot Simultaneous Localization and Mapping, pp. 853-858.

Saeedi Gharahbolagh, Sajad (Univ. of New Brunswick), Paull, Liam (Univ. of New Brunswick), Trentini, Michael (Defence Res. and Development Canada), Li, Howard (Univ. of New Brunswick)

08:45-08:50	TuAT2.4

Improving Occupancy Grid FastSLAM by Integrating Navigation Sensors, pp. 859-864.

Weyers, Christopher (Air Force Res. Lab.), Peterson, Gilbert (Air Force Inst. of Tech.)

08:50-08:55	TuAT2.5

Efficient Information-Theoretic Graph Pruning for Graph-Based SLAM with Laser Range Finders, pp. 865-871.

Kretzschmar, Henrik (Univ. of Freiburg), Stachniss, Cyrill (Univ. of Freiburg), Grisetti, Giorgio (Sapienza Univ. of Rome)

08:55-09:00	TuAT2.6

An Incremental Scheme for Dictionary-Based Compressive SLAM, pp. 872-879.

Nagasaka, Tomomi (Univ. of fukui), Tanaka, Kanji (Fukui Univ.)

09:00-09:15	TuAT2.7

Neural Network-Based Multiple Robot Simultaneous Localization and Mapping, pp. 880-885.

Saeedi Gharahbolagh, Sajad (Univ. of New Brunswick), Paull, Liam (Univ. of New Brunswick), Trentini, Michael (Defence Res. and Development Canada), Li, Howard (Univ. of New Brunswick)

09:15-09:30	TuAT2.8

Conservative Sparsification for Efficient and Consistent Approximate Estimation, pp. 886-893.

Vial, John (Univ. of Sydney), Durrant-Whyte, Hugh (The Univ. of Sydney), Bailey, Tim (Univ. of Sydney)

TuAT3	Continental Parlor 3
Symposium: Microrobotics I (Invited Session)	

Chair: Martel, Sylvain	Ec. Pol. de Montreal (EPM)
Co-Chair: Cappelleri, David	Stevens Inst. of Tech.
Organizer: Martel, Sylvain	Ec. Pol. de Montreal (EPM)
Organizer: Cappelleri, David	Stevens Inst. of Tech.

08:00-08:15	TuAT3.1

Semi-Plenary Invited Talk: History of Microrobotics and Vision for the Future: Microassembly and Beyond*.

Fukuda, Toshio (Nagoya Univ.)

08:30-08:45	TuAT3.3

Remote Microscale Teleoperation through Virtual Reality and Haptic Feedback (I), pp. 894-900.

Bolopion, Aude (Univ. Pierre et Marie-Curie, Paris 6 / CNRS UMR7222), Stolle, Christian (Univ. of Oldenburg), Tunnell, Robert (Univ. of Oldenburg, Div. Microrobotics and Control Engi), Haliyo, Dogan Sinan (Univ. Pierre et Marie Curie - Paris 6 - CNRS),

Régnier, Stéphane (Univ. Pierre et Marie Curie), Fatikow, Sergej (Univ. of Oldenburg)

08:45-08:50	TuAT3.4

Miniature Ferromagnetic Robot Fish Actuated by a Clinical Magnetic Resonance Scanner (I), pp. 901-906.

Gosselin, Frederick P. (Ec. Pol. de Montréal), Zhou, David (Univ. de Montréal, Pol.), Lalande, Viviane (Ec. Pol. de Montréal), Vonthron, Manuel (École Pol. de Montréal), Martel, Sylvain (Ec. Pol. de Montreal (EPM))

08:50-08:55	TuAT3.5

Hybrid Microassembly of Chips on Low Precision Patterns Assisted by Capillary Self-Alignment (I), pp. 907-912.

Chang, Bo (Aalto Univ.), Jääskeläinen, Mirva (Helsinki Univ. of Tech.), Zhou, Quan (Aalto Univ.)

08:55-09:00	TuAT3.6

Design and Fabrication of a Novel Resonant Surface Sensitive to Out-Of-Plane Forces for the Indentation and Injection of Living Cells (I), pp. 913-918.

Desmaele, Denis (CEA), Boukallel, Mehdi (CEA), Régnier, Stéphane (Univ. Pierre et Marie Curie)

09:00-09:15	TuAT3.7

The Cellular Force Microscope (CFM): A Microrobotic System for Quantitating the Growth Mechanics of Living, Growing Plant Cells in Situ (I), pp. 919-924.

Felekis, Dimitrios (ETHZ), Muntwyler, Simon (ETH Zurich), Beyeler, Felix (ETH Zurich), Nelson, Bradley J. (ETH Zurich)

09:15-09:30	TuAT3.8

Caging Grasps for Micromanipulation & Microassembly (I), pp. 925-930.

Cappelleri, David (Stevens Inst. of Tech.), Fatovic, Michael (Stevens Inst. of Tech.), Fu, Zhenbo (Stevens Inst. of Tech.)

TuAT5	Continental Ballroom 5
Symposium: Medical Robotics I (Invited Session)	
Chair: Desai, Jaydev P.	Univ. of Maryland
Co-Chair: Fiorini, Paolo	Univ. of Verona
Organizer: Desai, Jaydev P.	Univ. of Maryland
Organizer: Fiorini, Paolo	Univ. of Verona

08:00-08:15	TuAT5.1

Semi-Plenary Invited Talk: Future of Surgical Robotics: Confluence of Surgeon Demands and Technology*.

Fiorini, Paolo (Univ. of Verona)

08:15-08:30	TuAT5.2

A Prototype of Pneumatically-Driven Forceps Manipulator with Force Sensing Capability Using a Simple Flexible Joint, pp. 931-936.

Haraguchi, Daisuke (Tokyo Inst. of Tech.), Tadano, Kotaro (Tokyo Inst. of Tech.), Kawashima, Kenji (Tokyo Inst. of Tech.)

08:30-08:45	TuAT5.3

Design of a User Interface for Intuitive Colonoscope Control, pp. 937-942.

Kuperij, Nicole (Univ. Twente), Reilink, Rob (Univ. of Twente), Schwartz, Matthijs P (Meander MC, Amersfoort, The Netherlands), Stramigioli, Stefano (Univ. of Twente), Misra, Sarthak (Univ. of Twente), Broeders, Ivo A. M. J. (Meander MC, Amersfoort, The Netherlands and Univ. of Twente)

08:45-08:50	TuAT5.4

Robot for Ultrasound-Guided Prostate Imaging and Intervention, pp. 943-948.

Kim, Chunwoo (Johns Hopkins Univ.), Chang, Doyoung (Seoul National Univ.), Schäfer, Felix (TWT Science and Innovation GmbH), Petrisor, Doru (Johns Hopkins Univ.), Han, Misop (Johns Hopkins Univ.), Stoianovici, Dan (Johns Hopkins Univ.)

08:50-08:55	TuAT5.5

A Modular, Mechatronic Joint Design for a Flexible Access Platform for MIS, pp. 949-954.

Noonan, David (Imperial Coll. London), Vitiello, Valentina (Imperial Coll. London), Shang, Jianzhong (Imperial Coll. London), Payne, Christopher (Imperial Coll. London), Yang, Guang-Zhong (Imperial Coll. London)

08:55-09:00	TuAT5.6

Development of a "Steerable Drill" for ACL Reconstruction to Create the Arbitrary Trajectory of a Bone Tunnel, pp. 955-960.

Watanabe, Hiroki (Waseda Univ.), Kanou, Kazuki (Waseda Univ.), Kobayashi, Yo (Waseda Univ.), Fujie, Masakatsu G. (Waseda Univ.)

09:00-09:15	TuAT5.7

Design of an Endoscopic Stitching Device for Surgical Obesity Treatment Using a N.O.T.E.S Approach, pp. 961-966. Attachment

Xu, Kai (Shanghai Jiao Tong Univ.), Zhao, Jiangran (Shanghai Jiao Tong Univ.), Geiger, James (Univ. of Michigan, Ann Arbor), Shih, Albert J. (Univ. of Michigan, Ann Arbor), Zheng, Minhua (Shanghai Jiao Tong Univ.)

09:15-09:30	TuAT5.8

Active Bending Endoscope Robot System for Navigation through Sinus Area, pp. 967-972. Attachment

Yoon, Hyun-Soo (Hanyang Univ.), Oh, Se Min (Hanyang Univ.), Jeong, Jin Hyeok (Hanyang Univ.), Lee, Seung Hwan (Hanyang Univ.), Yi, Byung-Ju (Hanyang Univ.), Koh, Kyoung-Chul (Sun Moon Univ.), Tae, Kyung (Hanyang Univ.)

TuAT6	Continental Ballroom 6
Symposium: Grasping and Manipulation: Control and Learning (Invited Session)	
Chair: Ciocarlie, Matei	Willow Garage
Co-Chair: Allen, Peter	Columbia Univ.
Organizer: Ciocarlie, Matei	Willow Garage
Organizer: Allen, Peter	Columbia Univ.

08:00-08:15	TuAT6.1

Semi-Plenary Invited Talk: Get a Grip -- Robotic Dexterous Manipulation from Finger Choreography to the Power Pinch*.

Cutkosky, Mark (Stanford Univ.)

08:30-08:45	TuAT6.3

Synergy Level Impedance Control for Multifingered Hands, pp. 973-979. Attachment

Wimboeck, Thomas (German Aerospace Center (DLR)), Jahn, Benjamin (TU Ilmenau), Hirzinger, Gerd (German Aerospace Center (DLR))

08:45-08:50	TuAT6.4

Embodiment-Specific Representation of Robot Grasping Using Graphical Models and Latent-Space Discretization, pp. 980-986.

Song, Dan (Royal Inst. of Tech. (KTH), Stockholm, Ek, Carl Henrik (Royal Inst. of Tech.), Huebner, Kai (Royal Inst. of Tech. (KTH), Stockholm), Kragic, Danica (KTH)

08:50-08:55	TuAT6.5

Grasping Unknown Objects Using an Early Cognitive Vision System for General Scene Understanding, pp. 987-994.

Popovic, Mila (Univ. of Southern Denmark), Kootstra, Gert (Royal Inst. of Tech. (KTH), Stockholm), Jørgensen, Jimmy Alison (Univ. of Southern Denmark), Kragic, Danica (KTH), Krüger, Norbert

(Univ. of Southern Denmark)

08:55-09:00	TuAT6.6

Grasping of Unknown Objects Via Curvature Maximization Using Active Vision, pp. 995-1001. Attachment

Calli, Berk (Delft Univ. of Tech.), Wisse, Martijn (Delft Univ. of Tech.), Jonker, Pieter (Delft Univ. of Tech.)

09:00-09:15	TuAT6.7

Imitation Learning of Human Grasping Skills from Motion and Force Data, pp. 1002-1007.

Schmidts, Alexander Markus (Tech. Univ. München), Lee, Dongheui (Tech. Univ. of Munich), Peer, Angelika (Tech. Univ. München)

09:15-09:30	TuAT6.8

Internal Force Control with No Object Motion in Compliant Robotic Grasps, pp. 1008-1014.

Malvezzi, Monica (Univ. of Siena), Prattichizzo, Domenico (Istituto Italiano di Tecnologia)

TuAT7	Continental Parlor 7
Software Architectures & Frameworks (Regular Session)	
Chair: Biggs, Geoffrey	National Inst. of AIST
Co-Chair: Philippsen, Roland	Stanford Univ.

08:00-08:15	TuAT7.1

Intelligent System Architectures - Comparison by Translation, pp. 1015-1021.

Dittes, Benjamin (Honda Res. Inst. Europe GmbH), Goerick, Christian (Honda Res. Inst. Europe GmbH)

08:15-08:30	TuAT7.2

Conductor: A Controller Development Framework for High Degree of Freedom Systems, pp. 1022-1029.

Sherbert, Robert (Drexel Univ.), Oh, Paul Y. (Drexel Univ.)

08:30-08:45	TuAT7.3

Analysis of Software Connectors in Robotics, pp. 1030-1035.

Shakhimardanov, Azamat (FH Bonn-Rhein-Sieg), Hochgeschwender, Nico (Bonn-Rhein-Sieg Univ. of Applied Sciences, Germany), Reckhaus, Michael (Bonn-Rhine-Sieg Univ.), Kraetzschmar, Gerhard (Bonn-Rhine-Sieg Univ. of Applied Sciences)

08:45-08:50	TuAT7.4

An Open Source Extensible Software Package to Create Whole-Body Compliant Skills in Personal Mobile Manipulators (I), pp. 1036-1041.

Philippsen, Roland (Stanford Univ.), Sentis, Luis (The Univ. of Texas at Austin), Khatib, Oussama (Stanford Univ.)

08:50-08:55	TuAT7.5

A Component Supervisor for RT-Middleware Using Supervision Trees, pp. 1042-1047.

Biggs, Geoffrey (National Inst. of AIST), Ando, Noriaki (National Inst. of Advanced Industrial ScienceandTechnology), Kotoku, Tetsuo (National Inst. of AIST)

08:55-09:00	TuAT7.6

Stream-Oriented Robotics Programming: The Design of Roshask, pp. 1048-1054.

Cowley, Anthony (Univ. of Pennsylvania), Taylor, Camillo Jose (Univ. of Pennsylvania)

09:00-09:15	TuAT7.7

The Computing and Communication Architecture of the DLR Hand Arm System, pp. 1055-1062.

Joerg, Stefan (German Aerospace Center (DLR)), Nickl, Mathias (German Aerospace Center (DLR e.V.)), Nothhelfer, Alexander

(DLR, German Aerospace Center), Bahls, Thomas (German Aerospace Center), Hirzinger, Gerd (German Aerospace Center (DLR))

09:15-09:30	TuAT7.8

Caliper: A Universal Robot Simulation Framework for Tendon-Driven Robots, pp. 1063-1068.

Wittmeier, Steffen (Tech. Univ. of Munich), Jäntsch, Michael (Tech. Univ. of Munich), Dalamagkidis, Konstantinos (TU Munich), Rickert, Markus (fortiss GmbH), Marques, Hugo (Univ. of Zürich), Knoll, Alois (TU Munich)

TuAT8	Continental Parlor 8
Bio-Inspired & Biomimetic Robots (Regular Session)	
Chair: Wood, Robert	Harvard Univ.
Co-Chair: Choset, Howie	Carnegie Mellon Univ.

08:00-08:15	TuAT8.1

Using Response Surfaces and Expected Improvement to Optimize Snake Robot Gait Parameters, pp. 1069-1074. Attachment

Tesch, Matthew (Carnegie Mellon Univ.), Schneider, Jeff (Carnegie Mellon Univ.), Choset, Howie (Carnegie Mellon Univ.)

08:15-08:30	TuAT8.2

State Estimation for Snake Robots, pp. 1075-1080.

Rollinson, David (Carnegie Mellon Univ.), Buchan, Austin (Carnegie Mellon Univ.), Choset, Howie (Carnegie Mellon Univ.)

08:30-08:45	TuAT8.3

Snake-Like Active Wheel Robot ACM-R4.1 with Joint Torque Sensor and Limiter, pp. 1081-1086. Attachment

Takaoka, Shunichi (Tokyo Inst. of Tech.), Yamada, Hiroya (Tokyo Inst. of Tech.), Hirose, Shigeo (Tokyo Inst. of Tech.)

08:45-08:50	TuAT8.4

Task-Space Control of Extensible Continuum Manipulators, pp. 1087-1092.

Kapadia, Apoorva (Clemson Univ.), Walker, Ian (Clemson Univ.)

08:50-08:55	TuAT8.5

Novel Modal Approach for Kinematics of Multisection Continuum Arms, pp. 1093-1098. Attachment

Godage, Isuru S. (Istituto Italiano di Tecnologia), Guglielmino, Emanuele (Italian Inst. of Tech.), Branson, David (Istituto Italiano di Tecnologia (IIT)), Medrano-Cerda, Gustavo (Italian Inst. of Tech.), Caldwell, Darwin G. (Italian Inst. of Tech.)

08:55-09:00	TuAT8.6

Hardware in the Loop for Optical Flow Sensing in a Robotic Bee, pp. 1099-1106.

Duhamel, Pierre-Emile (Harvard Univ.), Porter, Judson (Harvard Univ.), Finio, Benjamin (Harvard Univ.), Barrows, Geoffrey (Centeye, Inc.), Brooks, David (Harvard Univ.), Wei, Gu-Yeon (Harvard Univ.), Wood, Robert (Harvard Univ.)

09:00-09:15	TuAT8.7

System Identification and Linear Time-Invariant Modeling of an Insect-Sized Flapping-Wing Micro Air Vehicle, pp. 1107-1114.

Finio, Benjamin (Harvard Univ.), Perez-Arancibia, Nestor O (Harvard Univ.), Wood, Robert (Harvard Univ.)

09:15-09:30	TuAT8.8

The Acquisition of Intentionally Indexed and Object Centered Affordance Gradients : A Biomimetic Controller and Mobile Robotics Benchmark, pp. 1115-1121. Attachment

Sanchez Fibla, Marti (Univ. Pompeu Fabra (UPF)), Duff, Armin (Univ. Pompeu Fabra), Verschure, Paul (Catalan Inst. of Advanced Studies (ICREA), Foundation)

TuAT9	Continental Parlor 9
Probabilistic Exploration and Coverage (Regular Session)	
Chair: Gupta, S.K.	Univ. of Maryland
Co-Chair: Bretl, Timothy	Univ. of Illinois at Urbana-Champaign

08:00-08:15	TuAT9.1

Exploration Driven by Local Potential Distortions, pp. 1122-1127.

Prestes, Edson (UFRGS), Engel, Paulo (UFRGS)

08:15-08:30	TuAT9.2

Histogram Based Frontier Exploration, pp. 1128-1133.

Mobarhani, Amir (ARAS Res. Group), Nazari, Shaghayegh (ARAS Res. Group), Tamjidi, Amir Hossein (Univ. of Arkansas at Little Rock), Taghirad, Hamid (K.N.Toosi Univ. of Tech.)

08:30-08:45	TuAT9.3

Adaptive Look-Ahead for Robotic Navigation in Unknown Environments, pp. 1134-1139.

Droge, Greg (Georgia Inst. of Tech. Dept of Electrical and Computer), Egerstedt, Magnus (Georgia Inst. of Tech.)

08:45-08:50	TuAT9.4

A Receding Horizon Approach to Generating Dynamically Feasible Plans for Vehicles That Operate Over Large Areas, pp. 1140-1145.

Stilwell, Daniel (Virginia Tech.), Gadre, Aditya (Virginia Tech.), Kurdila, Andrew (Virginia Tech.)

08:50-08:55	TuAT9.5

Planning for Landing Site Selection in the Aerial Supply Delivery, pp. 1146-1153. Attachment

Kushleyev, Aleksandr (Univ. of Pennsylvania), Likhachev, Maxim (Carnegie Mellon Univ.), MacAllister, Brian (Univ. of Pennsylvania)

08:55-09:00	TuAT9.6

Trajectory Planning with Look-Ahead for Unmanned Sea Surface Vehicles to Handle Environmental Disturbances, pp. 1154-1159.

Svec, Petr (Univ. of Maryland, Coll. Park), Schwartz, Maxim (Energetics Tech. Center), Thakur, Atul (Univ. of Maryland, Coll. Park), Gupta, Satyandra K. (Univ. of Maryland, Coll. Park)

09:00-09:15	TuAT9.7

Probably Approximately Correct Coverage for Robots with Uncertainty, pp. 1160-1166. Attachment

Das, Colin (Univ. of Illinois at Urbana-Champaign), Becker, Aaron (Univ. of Illinois at Urbana-Champaign), Bretl, Timothy (Univ. of Illinois at Urbana-Champaign)

09:15-09:30	TuAT9.8

A Dynamic Sensor Placement Algorithm for Dense Sampling, pp. 1167-1172.

Bhatawadekar, Vineet (Univ. of Minnesota), Sivalingam, Ravishankar (Univ. of Minnesota), Papanikolopoulos, Nikos (Univ. of Minnesota)

TuAPT10	Golden Gate Room
Interactive II (Interactive Session)	

08:00-09:30	TuAPT10.1

Modeling and Design of Magnetic Sugar Particles Manipulation System for Fabrication of Vascular Scaffold*.

Hu, Chengzhi (Nagoya Univ.), Tercero Villagran, Carlos Rafael (Nagoya Univ.), Ikeda, Seiichi (Nagoya Univ.), Fukuda, Toshio (Nagoya Univ.), Arai, Fumihito (Nagoya Univ.), Negoro, Makoto (Fujita Health Univ.)

08:00-09:30	TuAPT10.2

Toward Intuitive Teleoperation of Micro/Nano-Manipulators with Piezoelectric Stick-Slip Actuators*.

Nambi, Manikantan (Univ. of Utah), Damani, Aayush (Univ. of Utah), Abbott, Jake (Univ. of Utah)

08:00-09:30	TuAPT10.3

Pairing and Moving Swarm of Micro Particles into Array with a Robot-Tweezer Manipulation System*.

Chen, Haoyao (Harbin Inst. of Tech. Shenzhen Graduate School), Sun, Dong (City Univ. of Hong Kong)

08:00-09:30	TuAPT10.4

Active Target Localization for Bearing Based Robotic Telemetry*.

Tokekar, Pratap (Univ. of Minnesota), Vander Hook, Joshua (Univ. of Minnesota), Isler, Volkan (Univ. of Minnesota)

08:00-09:30	TuAPT10.5

Orientation Descriptors for Localization in Urban Environments*.

David, Philip (U.S. Army Res. Lab.), Ho, Sean (Army Res. Lab.)

08:00-09:30	TuAPT10.6

A Hybrid Estimation Framework for Cooperative Localization under Communication Constraints*.

Nerurkar, Esha (Univ. of Minnesota), Zhou, Ke (Univ. of Minnesota), Roumeliotis, Stergios (Univ. of Minnesota)

08:00-09:30	TuAPT10.7

SLAM-Based Online Calibration of Asynchronous Microphone Array for Robot Audition (I)*.

Miura, Hiroki (Tokyo Inst. of Tech.), Yoshida, Takami (Tokyo Inst. of Tech.), Nakamura, Keisuke (Honda Res. Inst. Japan Co., Ltd.), Nakadai, Kazuhiro (Honda Res. Inst. Japan Co., Ltd.)

08:00-09:30	TuAPT10.8

HARK Based Real-Time Single Pane 3D Auditory Scene Visualizer Empowered by Speech Arrow (I)*.

Gong, Zheng (Tokyo Inst. of Tech.), Nakadai, Kazuhiro (Honda Res. Inst. Japan Co., Ltd.), Nakajima, Hirofumi (Honda Res. Inst. Japan Co., Ltd.), Hagiwara, Ichiro (Tokyo Inst. of Tech.)

08:00-09:30	TuAPT10.9

Multi-Modal Front-End for Speaker Activity Detection in Small Meetings (I)*.

Even, Jani (ATR), Heracleous, Panikos (ATR Intelligent Robotics and Communication Lab.), Ishi, Carlos Toshinori (ATR), Hagita, Norihiro (ATR)

08:00-09:30	TuAPT10.10

ScarlETH: Design and Control of a Planar Running Robot (I)*.

Hutter, Marco (ETH Zurich), Remy, C. David (ETH Zurich), Hoepflinger, Mark (ETH Zurich), Siegwart, Roland (ETH Zurich)

08:00-09:30	TuAPT10.11

Modeling and Control on Hysteresis Nonlinearity in Biorobotic Undulating Fins (I)*.

Hu, Tianjiang (National Univ. of Defense Tech.), Zhu, Huayong (NUDT), Han, Zhou (NUDT), Shen, Lincheng (National Univ. of Defense Tech.)

08:00-09:30	TuAPT10.12

Translational Damping on Flapping Cicada Wings (I)*.

Parks, Perry (Purdue Univ.), Hu, Zheng (Univ. of Delaware), Cheng, Bo (Purdue Univ.), Deng, Xinyan (Purdue Univ.)

08:00-09:30	TuAPT10.13

Control of a Passively Steered Rover Using 3-D Kinematics*.

Seegmiller, Neal Andrew (Carnegie Mellon Univ.), Wettergreen, David (Carnegie Mellon Univ.)

08:00-09:30	TuAPT10.14

Optical Flow Odometry with Robustness to Self-Shadowing*.

Seegmiller, Neal Andrew (Carnegie Mellon Univ.), Wettergreen, David (Carnegie Mellon Univ.)

08:00-09:30	TuAPT10.15

Vision-Based Space Autonomous Rendezvous : A Case Study*.

Petit, Antoine (IRISA/INRIA Rennes-Bretagne Atlantique), Marchand, Eric (Univ. de Rennes 1, IRISA, INRIA Rennes), Kanani, Keyvan (EADS Astrium)

08:00-09:30	TuAPT10.16

An Enhanced Sliding-Mode Control for a Pneumatic-Actuated Teleoperation System*.

Le, Minh-Quyen (INSA de Lyon), Pham, Minh Tu (INSA de Lyon (Inst. National des Sciences Appliquees)), Tavakoli, Mahdi (Univ. of Alberta), Moreau, Richard (INSA-Lyon)

08:00-09:30	TuAPT10.17

Subspace-Oriented Energy Distribution for the Time Domain Passivity Approach*.

Ott, Christian (German Aerospace Center (DLR)), Artigas, Jordi (DLR - German Aerospace Center), Preusche, Carsten (German Aerospace Center (DLR))

08:00-09:30	TuAPT10.18

EMG-Based Teleoperation and Manipulation with the DLR LWR-III*.

Vogel, Joern (German Aerospace Center), Castellini, Claudio (DLR - German Aerospace Res. Center), van der Smagt, Patrick (DLR)

08:00-09:30	TuAPT10.19

Learning to Control Planar Hitting Motions in a Minigolf-Like Task*.

Kronander, Klas (Learning Algorithms and Systems Lab. EPFL), Khansari-Zadeh, Seyed Mohammad (EPFL), Billard, Aude (EPFL)

08:00-09:30	TuAPT10.20

Stiffness and Temporal Optimization in Periodic Movements: An Optimal Control Approach*.

Nakanishi, Jun (Univ. of Edinburgh), Rawlik, Konrad (Univ. of Edinburgh), Vijayakumar, Sethu (Univ. of Edinburgh)

08:00-09:30	TuAPT10.21

Improving Operational Space Control of Heavy Manipulators Via Open-Loop Compensation*.

Maeda, Guilherme Jorge (The Univ. of Sydney), Singh, Surya (The Univ. of Queensland), Rye, David (The Univ. of Sydney)

08:00-09:30	TuAPT10.22

Soft Robot Actuators Using Energy-Efficient Valves Controlled by Electropermanent Magnets*.

Marchese, Andrew (Massachusetts Inst. of Tech.), Onal, Cagdas Denizel (Massachusetts Inst. of Tech.), Rus, Daniela (MIT)

08:00-09:30	TuAPT10.23

Synthesis of a Non-Circular Cable Spool to Realize a Nonlinear Rotational Spring*.

Schmit, Nicolas (Tokyo Inst. of Tech.), Okada, Masafumi (Tokyo Inst. of Tech.)

08:00-09:30	TuAPT10.24

Avoiding Joint Limits with a Low-Level Fusion Scheme*.

Kermorgant, Olivier (INRIA Rennes-Bretagne Atlantique), Chaumette, Francois (INRIA Rennes-Bretagne Atlantique)

TuBT1	Continental Parlor 1
Perception, Saliency and Novelty (Regular Session)	
Chair: Gans, Nicholas	Univ. Texas at Dallas
Co-Chair: Zillich, Michael	Vienna Univ. of Tech.

10:00-10:15	TuBT1.1

Multimodal Saliency-Based Attention for Object-Based Scene Analysis, pp. 1173-1179.

Schauerte, Boris (Karlsruhe Inst. of Tech.), Kuehn, Benjamin (Karlsruhe Inst. of Tech. (KIT)), Kroschel, Kristian (Fraunhofer Inst. of Optronics, System Tech. and Image), Stiefelhagen, Rainer (Karlsruhe Inst. of Tech.)

10:15-10:30	TuBT1.2

Robots Looking for Interesting Things: Extremum Seeking Control on Saliency Maps, pp. 1180-1186.

Zhang, Yinghua (The Univ. of Texas at Dallas), Shen, Jinglin (Univ. of Texas at Dallas), Rotea, Mario (The Univ. of Texas at Dallas), Gans, Nicholas (Univ. Texas at Dallas)

10:30-10:45	TuBT1.3

Optimisation of Gaze Movement for Multitasking Using Rewards, pp. 1187-1193.

Karaoguz, Cem (Bielefeld Univ.), Rodemann, Tobias (Honda Res. Inst. Europe), Wrede, Britta (Bielefeld Univ.)

10:45-10:50	TuBT1.4

Novelty Detection Using Growing Neural Gas for Visuo-Spatial Memory, pp. 1194-1200. <u>Attachment</u>

Kit, Dmitry (Univ. of Texas at Austin), Sullivan, Brian (Univ. of Texas at Austin), Ballard, Dana (The Univ. of Texas at Austin)

10:50-10:55	TuBT1.5

Coherent Spatial Abstraction and Stereo Line Detection for Robotic Visual Attention, pp. 1201-1207.

Zhou, Kai (Automation and Control Inst. Vienna Univ. of Tech.), Richtsfeld, Andreas (Vienna Univ. of Tech.), Zillich, Michael (Vienna Univ. of Tech.), Vincze, Markus (Vienna Univ. of Tech.)

10:55-11:00	TuBT1.6

Visual Machinery Surveillance for High-Speed Periodic Operations, pp. 1208-1213.

Ishii, Idaku (Hiroshima Univ.), Wang, Yao-Dong (Hiroshima Univ.), Takaki, Takeshi (Hiroshima Univ.)

11:00-11:15	TuBT1.7

Visual Anomaly Detection under Temporal and Spatial Non-Uniformity for News Finding Robot, pp. 1214-1220.

Suzuki, Takahiro (The Univ. of Tokyo), Bessho, Fumihiro (The Univ. of Tokyo), Harada, Tatsuya (The Univ. of Tokyo), Kuniyoshi, Yasuo (The Univ. of Tokyo)

11:15-11:30	TuBT1.8

Representation of Manipulation-Relevant Object Properties and Actions for Surprise-Driven Exploration, pp. 1221-1227.

Petsch, Susanne (Tech. Univ. München), Burschka, Darius (Tech. Univ. Muenchen)

TuBT2	
Semantic SLAM & Loop Closure (Regular Session)	
Chair: Burgard, Wolfram	Univ. of Freiburg
Co-Chair: Civera, Javier	Univ. de Zaragoza

10:00-10:15	TuBT2.1

Application of Locality Sensitive Hashing to Real-Time Loop Closure Detection, pp. 1228-1233.

Shahbazi, Hossein (Univ. of Alberta), Zhang, Hong (Univ. of Alberta)

10:15-10:30	TuBT2.2

BRIEF-Gist - Closing the Loop by Simple Means, pp. 1234-1241.

Sünderhauf, Niko (Chemnitz Univ. of Tech.), Protzel, Peter (Chemnitz Univ. of Tech.)

10:30-10:45	TuBT2.3

Bathymetric SLAM with No Map Overlap Using Gaussian Processes, pp. 1242-1248.

Barkby, Stephen (Univ. of Sydney), Williams, Stefan Bernard (Univ. of Sydney), Pizarro, Oscar (Australian Centre for Field Robotics), Jakuba, Michael (Univ. of Sydney)

10:45-10:50	TuBT2.4

Place Recognition in 3D Scans Using a Combination of Bag of Words and Point Feature Based Relative Pose Estimation, pp. 1249-1255.

Steder, Bastian (Univ. of Freiburg), Ruhnke, Michael (Univ. of Freiburg), Grzonka, Slawomir (Albert-Ludwigs-Univ. of Freiburg), Burgard, Wolfram (Univ. of Freiburg)

10:50-10:55	TuBT2.5

Adaptive Appearance Based Loop-Closing in Heterogeneous Environments, pp. 1256-1263. Attachment

Majdik, Andras (Tech. Univ. of Cluj-Napoca), Galvez Lopez, Dorian (Univ. de Zaragoza), Lazea Gheorghe, Gheorghe (Tech. Univ. of Cluj-Napoca), Castellanos, Jose A. (Univ. of Zaragoza)

10:55-11:00	TuBT2.6

Simultaneous Localization and Mapping with Learned Object Recognition and Semantic Data Association, pp. 1264-1270. Attachment

Rogers III, John G. (Georgia Inst. of Tech.), Trevor, Alexander J B (Georgia Inst. of Tech.), Nieto-Granda, Carlos (Georgia Inst. of Tech.), Christensen, Henrik Iskov (Georgia Inst. of Tech.)

11:00-11:15	TuBT2.7

Memory Management for Real-Time Appearance-Based Loop Closure Detection, pp. 1271-1276.

Labbé, Mathieu (Univ. de Sherbrooke), Michaud, Francois (Univ. de Sherbrooke)

11:15-11:30	TuBT2.8

Towards Semantic SLAM Using a Monocular Camera, pp. 1277-1284. Attachment

Civera, Javier (Univ. de Zaragoza), Galvez Lopez, Dorian (Univ. de Zaragoza), Riazuelo, Luis (Inst. de Investigación en Ingeniería de Aragón, Univ. o), Tardos, Juan D. (Univ. de Zaragoza), Montiel, J.M.M (Univ. de Zaragoza)

TuBT3	Continental Parlor 3
Symposium: Microrobotics II (Invited Session)	
Chair: Cappelleri, David	Stevens Inst. of Tech.
Co-Chair: Martel, Sylvain	Ec. Pol. de Montreal (EPM)
Organizer: Martel, Sylvain	Ec. Pol. de Montreal (EPM)
Organizer: Cappelleri, David	Stevens Inst. of Tech.

10:00-10:15	TuBT3.1

Semi-Plenary Invited Talk: Microrobotics for Biomedical Applications*.

Dario, Paolo (Scuola Superiore Sant'Anna)

10:30-10:45	TuBT3.3

A MRI-Based Integrated Platform for the Navigation of Microdevices and Microrobots (I), pp. 1285-1290.

Vonthron, Manuel (École Pol. de Montréal), Lalande, Viviane (Ec. Pol. de Montréal), Bringout, Gael (École Pol. de Montréal), Tremblay, Charles (École Pol. de Montréal), Martel, Sylvain (Ec. Pol. de Montreal (EPM))

10:45-10:50	TuBT3.4

Rotating Magnetic Micro-Robots for Versatile Non-Contact Fluidic Manipulation of Micro-Objects (I), pp. 1291-1296. Attachment

Diller, Eric D. (Carnegie Mellon Univ.), Ye, Zhou (Carnegie Mellon Univ.), Sitti, Metin (Carnegie Mellon Univ.)

10:50-10:55	TuBT3.5

MRI Magnetic Signature Imaging, Tracking and Navigation for Targeted Micro/Nano-Capsule Therapeutics (I), pp. 1297-1303.

Folio, David (ENSI de Bourges), Dahmen, Christian (Univ. of Oldenburg), Wortmann, Tim (Univ. of Oldenburg), Zeeshan, Arif Muhammad (ETH Zurich), Shou, Kaiyu (Swiss Federal Inst. of Tech. Zurich (ETH Zurich)), Pane, Salvador (ETH Zurich), Nelson, Bradley J. (ETH Zurich), Ferreira, Antoine (Univ. of Orléans), Fatikow, Sergej (Univ. of Oldenburg)

10:55-11:00	TuBT3.6

Tumor Targeting by Computer Controlled Guidance of Magnetotactic Bacteria Acting Like Autonomous Microrobots (I), pp. 1304-1308.

Felfoul, Ouajdi (Ec. Pol. de Montreal (EPM)), Mohammadi, Mahmood (Ec. Pol. de Montreal (EPM)), Gaboury, Louis (Department of Pathology and Cell Biology, Faculty of Medicine, U), Martel, Sylvain (Ec. Pol. de Montreal (EPM))

11:00-11:15	TuBT3.7

Design and Fabrication of Air-Flow Based Single Particle Dispensing System (I), pp. 1309-1314.

Kawahara, Tomohiro (Nagoya Univ.), Ohashi, Shigeo (Nagoya Univ.), Hagiwara, Masaya (Nagoya Univ.), Yamanishi, Yoko (Nagoya Univ.), Arai, Fumihito (Nagoya Univ.)

11:15-11:30	TuBT3.8

Microrobotic Simulator for Assisted Biological Cell Injection (I), pp. 1315-1320.

Ladjal, Hamid (ENSI Bourges, Univ. Orleans), Hanus, Jean Luc (ENSI Bourges), Ferreira, Antoine (ENSI Bourges)

TuBT5	Continental Ballroom 5
Symposium: Medical Robotics II (Invited Session)	
Chair: Fiorini, Paolo	Univ. of Verona
Co-Chair: Desai, Jaydev P.	Univ. of Maryland
Organizer: Desai, Jaydev P.	Univ. of Maryland
Organizer: Fiorini, Paolo	Univ. of Verona

10:00-10:15	TuBT5.1

Semi-Plenary Invited Talk: Challenges in MRI-Guided Interventions*.

Desai, Jaydev P. (Univ. of Maryland)

10:15-10:30	TuBT5.2

Investigation of Magnetic Guidance of Cochlear Implants (I), pp. 1321-1326. Attachment

Clark, James Romney (Univ. of Utah), Leon, Lisandro (Univ. of Utah), Warren, Frank (Oregon Health & Science Univ.), Abbott, Jake (Univ. of Utah)

10:30-10:45	TuBT5.3

On the Design of an Interactive, Patient-Specific Surgical Simulator for Mitral Valve Repair (I), pp. 1327-1332.

Tenenholtz, Neil (Harvard Univ.), Hammer, Peter (Harvard Univ.), Schneider, Robert (Harvard Univ.), Vasilyev, Nikolay (Children's Hospital Boston and Harvard Medical School), Howe, Robert D. (Harvard Univ.)

10:45-10:50	TuBT5.4

Ergonomic and Gesture Performance of Robotized Instruments for Laparoscopic Surgery, pp. 1333-1338.

Herman, Benoît (Univ. catholique de Louvain), Hassan Zahraee, Ali (Univ. Pierre et Marie Curie - Paris 6), Szewczyk, Jérôme (Univ. Pierre et Marie Curie-Paris 6), Morel, Guillaume (Univ. Pierre et Marie Curie - Paris 6), Bourdin, Christophe (CNRS UMR 6233), Vercher, Jean-Louis (CNRS UMR 6233), Gayet, Brice (Univ. Paris Descartes)

10:50-10:55	TuBT5.5

Laparoscopic Optical Biopsies: In Vivo Robotized Mosaicing with Probe-Based Confocal Endomicroscopy, pp. 1339-1345.

Rosa, Benoît (Univ. Pierre et Marie Curie - Paris 6), Herman, Benoît (Univ. catholique de Louvain), Szewczyk, Jérôme (Univ. Pierre et Marie Curie-Paris 6), Gayet, Brice (Univ. Paris Descartes), Morel, Guillaume (Univ. Pierre et Marie Curie - Paris 6)

10:55-11:00	TuBT5.6

Sensor and Sampling-Based Motion Planning for Minimally Invasive Robotic Exploration of Osteolytic Lesions, pp. 1346-1352.

Liu, Wen (Johns Hopkins Univ.), Lucas, Blake (Johns Hopkins Univ.), Guerin, Kelleher (Johns Hopkins Univ.), Plaku, Erion (Catholic Univ. of America)

11:00-11:15	TuBT5.7

Shape Estimation for Image-Guided Surgery with a Highly Articulated Snake Robot (I), pp. 1353-1358.

Tully, Stephen (Carnegie Mellon Univ.), Kantor, George (Carnegie Mellon Univ.), Zenati, Marco (Univ. of Pittsburgh), Choset, Howie (Carnegie Mellon Univ.)

11:15-11:30	TuBT5.8

A Virtual Scalpel System for Computer-Assisted Laser Microsurgery, pp. 1359-1365. Attachment

Mattos, Leonardo (Istituto Italiano di Tecnologia), Dagnino, Giulio (Istituto Italiano di Tecnologia), Becattini, Gabriele (Istituto Italiano di Tecnologia), Dellepiane, Massimo (Univ. of genova), Caldwell, Darwin G. (Italian Inst. of Tech.)

TuBT6	Continental Ballroom 6

Symposium: Grasping and Manipulation: Mechanics and Design (Invited Session)

Chair: Dollar, Aaron	Yale Univ.
Co-Chair: Edsinger, Aaron	Meka Robotics
Organizer: Dollar, Aaron	Yale Univ.
Organizer: Edsinger, Aaron	Meka Robotics

10:00-10:15	TuBT6.1

Semi-Plenary Invited Talk: Preliminary Results with NASA's Robonaut 2 Hand*.

Ambrose, Robert (NASA Johnson Space Center)

10:30-10:45	TuBT6.3

FAS a Flexible Antagonistic Spring Element for a High Performance Over Actuated Hand, pp. 1366-1372.

Friedl, Werner (German AerospaceCenter (DLR)), Chalon, Maxime (German Aerospace Center (DLR)), Reinecke, Jens (DLR), Grebenstein, Markus (German Aerospace Center (DLR))

10:45-10:50	TuBT6.4

Varying Spring Preloads to Select Grasp Strategies in an Adaptive Hand, pp. 1373-1379.

Aukes, Daniel (Stanford Univ.), Heyneman, Barrett (Stanford Univ.), Duchaine, Vincent (Univ. Laval), Cutkosky, Mark (Stanford Univ.)

10:50-10:55	TuBT6.5

A Highly-Underactuated Robotic Hand with Force and Joint Angle Sensors, pp. 1380-1385.

Wang, Long (Columbia Univ.), DelPreto, Joseph (Columbia Univ.), Bhattacharyya, Samrat (Vanderbilt Univ.), Weisz, Jonathan (Columbia Univ.), Allen, Peter (Columbia Univ.)

10:55-11:00	TuBT6.6

Active Outline Shaping of a Rheological Object Based on Plastic Deformation Distribution, pp. 1386-1391.

Yoshimoto, Kayo (Osaka Univ.), Higashimori, Mitsuru (Osaka Univ.), Tadakuma, Kenjiro (Osaka Univ.), Kaneko, Makoto (Osaka Univ.)

11:00-11:15	TuBT6.7

Dynamic Nonprehensile Shaping of a Thin Rheological Object, pp. 1392-1397.

Inahara, Tomoyuki (Osaka Univ.), Higashimori, Mitsuru (Osaka Univ.), Tadakuma, Kenjiro (Osaka Univ.), Kaneko, Makoto (Osaka Univ.)

11:15-11:30	TuBT6.8

Softness Effects on Manipulability and Grasp Stability, pp. 1398-1404.

Watanabe, Tetsuyou (Kanazawa Univ.)

TuBT7	Continental Parlor 7

Contact and Deformation (Regular Session)

Chair: Vona, Marsette	Northeastern Univ.
Co-Chair: Trinkle, Jeff	Rensselaer Pol. Inst.

10:00-10:15	TuBT7.1

Combining Imitation and Reinforcement Learning to Fold Deformable Planar Objects, pp. 1405-1412. Attachment

Balaguer, Benjamin (Univ. of California, Merced), Carpin, Stefano (Univ. of California, Merced)

10:15-10:30	TuBT7.2

Bimanual Robotic Cloth Manipulation for Laundry Folding, pp. 1413-1419. Attachment

Bersch, Christian (Robert Bosch LLC), Pitzer, Benjamin (Robert Bosch LLC), Kammel, Sören (Bosch LLC)

10:30-10:45	TuBT7.3

Toward Simpler Models of Bending Sheet Joints, pp. 1420-1426.

Odhner, Lael (Yale Univ.), Dollar, Aaron (Yale Univ.)

10:45-10:50	TuBT7.4

Bi-Manual Robotic Paper Manipulation Based on Real-Time Marker Tracking and Physical Modelling, pp. 1427-1432. Attachment

Elbrechter, Christof (Bielefeld Univ.), Haschke, Robert (Bielefeld Univ.), Ritter, Helge Joachim (Bielefeld Univ.)

10:50-10:55	TuBT7.5

Understanding the Difference between Prox and Complementarity Formulations for Simulation of Systems with Contact, pp. 1433-1438.

Schindler, Thorsten (INRIA Grenoble - Rhône-Alpes), Nguyen, Binh (Rensselaer Pol. Inst.), Trinkle, Jeff (Rensselaer Pol. Inst.)

10:55-11:00	TuBT7.6

Curved Surface Contact Patches with Quantified Uncertainty, pp. 1439-1446.

Vona, Marsette (Northeastern Univ.), Kanoulas, Dimitrios (Northeastern Univ.)

11:00-11:15	TuBT7.7

Estimation of Unknown Curvature Using a Coarse-Resolution Sensor and Contact Kinematics, pp. 1447-1452.

Phung, Tri Cong (Sungkyunkwan Univ.), Chae, Hansang (skku), Kim, Min Jeong (Sungkyunkwan Univ.), Choi, Dongmin (Sungkyunkwan Univ.), Shin, Seung Hoon (Sungkyunkwan Univ.), Moon, Hyungpil (Sungkyunkwan Univ.), Koo, Ja Choon (Sungkyunkwan Univ.), Choi, Hyouk Ryeol (Sungkyunkwan Univ.)

11:15-11:30	TuBT7.8

Singular Surfaces and Cusps in Symmetric Planar 3-RPR Manipulators, pp. 1453-1458.

Coste, Michel (Univ. de Rennes I), Wenger, Philippe (Ec. Centrale de Nantes), Chablat, Damien (Inst. de Recherche en Communications et Cybernétique de Nante)

TuBT8	Continental Parlor 8
Biomimetic Limbed Robots (Regular Session)	

Chair: Garcia, Elena	Centre for Automation and Robotics - CSIC-UPM
Co-Chair: Ly, Olivier	INRIA / Lab. - Bordeaux Univ.

10:00-10:15 — TuBT8.1

Arm-Hand Movement: Imitation of Human Natural Gestures with Tenodesis Effect, pp. 1459-1464.

Nguyen, Kien Cuong (Univ. Pierre et Marie Curie - Paris 6), Perdereau, Véronique (Univ. Pierre et Marie Curie - Paris 6)

10:15-10:30 — TuBT8.2

Bio-Inspired Vertebral Column, Compliance and Semi-Passive Dynamics in a Lightweight Humanoid Robot, pp. 1465-1472.

Ly, Olivier (INRIA / Lab. - Bordeaux Univ.), Lapeyre, Matthieu (INRIA Bordeaux Sud Ouest), Oudeyer, Pierre-Yves (INRIA)

10:30-10:45 — TuBT8.3

Climbot: A Modular Bio-Inspired Biped Climbing Robot, pp. 1473-1478. Attachment

Guan, Yisheng (South China Univ. of Tech.), Jiang, Li (South China Univ. of Tech.), Zhu, Haifei (South China Univ. of Tech.), Zhou, Xuefeng (Soth China Univ. of Tech.), Cai, Chuanwu (South China Univ. of Tech.), Wu, Wenqiang (South China Univ. of Tech.), Li, Zhanchu (South China Univ. of Tech.), Zhang, Hong (Univ. of Alberta), Zhang, Xianmin (South China Univ. of Tech.)

10:45-10:50 — TuBT8.4

Passive Undulatory Gaits Enhance Walking in a Myriapod Millirobot, pp. 1479-1486. Attachment

Hoffman, Katie (Harvard Univ.), Wood, Robert (Harvard Univ.)

10:50-10:55 — TuBT8.5

Mechanical Design of a Tree Gripper for Miniature Tree-Climbing Robots, pp. 1487-1492.

Lam, Tin Lun (The Chinese Univ. of Hong Kong / Shenzhen Inst. of Adva), Xu, Yangsheng (Chinese Univ. of Hong Kong /ShenzhenInstituteofAdvanced Tec)

10:55-11:00 — TuBT8.6

Bio-Inspired Step Crossing Algorithm for a Hexapod Robot, pp. 1493-1498. Attachment

Chou, Ya-Cheng (National Taiwan Univ.), Yu, Wei-Shun (National Taiwan Univ.), Huang, Ke Jung (National Taiwan Univ.), Lin, Pei-Chun (National Taiwan Univ.)

11:00-11:15 — TuBT8.7

Neural-Body Coupling for Emergent Locomotion: A Musculoskeletal Quadruped Robot with Spinobulbar Model, pp. 1499-1506.

Yamada, Yasunori (The Univ. of Tokyo), Nishikawa, Satoshi (Univ. of Tokyo), Shida, Kazuya (Univ. of Tokyo), Niiyama, Ryuma (Massachusetts Inst. of Tech.), Kuniyoshi, Yasuo (The Univ. of Tokyo)

11:15-11:30 — TuBT8.8

Design and Development of a Biomimetic Leg Using Hybrid Actuators, pp. 1507-1512.

Garcia, Elena (Centre for Automation and Robotics - CSIC-UPM), Arevalo, Juan Carlos (Inst. of Industrial Automation - CSIC), Sanchez, Fernando (CSIC), Sarria, Javier Francisco (Centre for Automation and Robotics - CSIC-UPM), Gonzalez de Santos, Pablo (Industrial Automation Inst. - CSIC)

TuBT9	Continental Parlor 9
Perceptual Learning (Regular Session)	

Chair: Kragic, Danica	KTH
Co-Chair: Bretl, Timothy	Univ. of Illinois at

Urbana-Champaign

10:00-10:15 — TuBT9.1

Learning Spatial Relations from Functional Simulation, pp. 1513-1519.

Sjöö, Kristoffer (Royal Inst. of Tech.), Jensfelt, Patric (Royal Inst. of Tech.)

10:15-10:30 — TuBT9.2

Multimodal Categorization by Hierarchical Dirichlet Process, pp. 1520-1525.

Nakamura, Tomoaki (Univ. of Electro-Communications), Nagai, Takayuki (Univ. of Electro-Communications), Iwahashi, Naoto (National Inst. ofInformationandCommunicationsTechnology)

10:30-10:45 — TuBT9.3

Online Multiple Instance Learning Applied to Hand Detection in a Humanoid Robot, pp. 1526-1532.

Ciliberto, Carlo (ISTITUTO ITALIANO DI TECNOLOGIA), Smeraldi, Fabrizio (Queen Mary Univ. of London), Natale, Lorenzo (Istutito Italiano di Tecnologia), Metta, Giorgio (Istituto Italiano di Tecnologia (IIT))

10:45-10:50 — TuBT9.4

Active Learning Using a Variational Dirichlet Process Model for Pre-Clustering and Classification of Underwater Stereo Imagery, pp. 1533-1539.

Friedman, Ariell (Univ. of Sydney), Steinberg, Daniel (The Univ. of Sydney), Pizarro, Oscar (Australian Centre for Field Robotics), Williams, Stefan Bernard (Univ. of Sydney)

10:50-10:55 — TuBT9.5

Autonomous Acquisition of Multimodal Information for Online Object Concept Formation by Robots, pp. 1540-1547.

Araki, Takaya (Univ. of Electro-Communications), Nakamura, Tomoaki (Univ. of Electro-Communications), Nagai, Takayuki (Univ. of Electro-Communications), Funakoshi, Kotaro (Honda Res. Inst. Japan Co., Ltd.), Nakano, Mikio (Honda Res. Inst. Japan), Iwahashi, Naoto (National Inst. ofInformationandCommunicationsTechnology)

10:55-11:00 — TuBT9.6

Learning Robot Grasping from 3-D Images with Markov Random Fields, pp. 1548-1553. Attachment

Boularias, Abdeslam (Max Planck Inst. for Intelligent Systems), Kroemer, Oliver (Max-Planck Inst. for Biological Cybernetics), Peters, Jan (Darmstadt Univ. of Tech.)

11:00-11:15 — TuBT9.7

Learning Tactile Characterizations of Object and Pose-Specific Grasps, pp. 1554-1560. Attachment

Bekiroglu, Yasemin (KTH), Detry, Renaud (Royal Inst. of Tech. (KTH)), Kragic, Danica (KTH)

11:15-11:30 — TuBT9.8

Maximum Entropy Inverse Reinforcement Learning in Continuous State Spaces with Path Integrals, pp. 1561-1566.

Aghasadeghi, Navid (Univ. of Illinois at Urbana Champaign), Bretl, Timothy (Univ. of Illinois at Urbana-Champaign)

TuBPT10	Golden Gate Room
Interactive III (Interactive Session)	

10:00-11:30 — TuBPT10.1

Visual and Physical Segmentation of Novel Objects*.

Almaddah, Amr (Osaka Univ.), Mae, Yasushi (Osaka Univ.), Ohara, Kenichi (Osaka Univ.), Takubo, Tomohito (Osaka Univ.), Arai, Tatsuo (Osaka Univ.)

10:00-11:30 — TuBPT10.2

*Knowing Your Limits – Self-Evaluation and Prediction in Object Recognition**.

Zillich, Michael (Vienna Univ. of Tech.), Prankl, Johann (Univ. of Tech. Vienna), Mörwald, Thomas (Vienna Univ. of Tech.), Vincze, Markus (Vienna Univ. of Tech.)

10:00-11:30	TuBPT10.3

*Depth Kernel Descriptors for Object Recognition**.

Bo, Liefeng (Univ. of Washington), Ren, Xiaofeng (Intel Lab.), Fox, Dieter (Univ. of Washington)

10:00-11:30	TuBPT10.4

*Improving Occupancy Grid FastSLAM by Integrating Navigation Sensors**.

Weyers, Christopher (Air Force Res. Lab.), Peterson, Gilbert (Air Force Inst. of Tech.)

10:00-11:30	TuBPT10.5

*Efficient Information-Theoretic Graph Pruning for Graph-Based SLAM with Laser Range Finders**.

Kretzschmar, Henrik (Univ. of Freiburg), Stachniss, Cyrill (Univ. of Freiburg), Grisetti, Giorgio (Sapienza Univ. of Rome)

10:00-11:30	TuBPT10.6

*An Incremental Scheme for Dictionary-Based Compressive SLAM**.

Nagasaka, Tomomi (Univ. of fukui), Tanaka, Kanji (Fukui Univ.)

10:00-11:30	TuBPT10.7

*Miniature Ferromagnetic Robot Fish Actuated by a Clinical Magnetic Resonance Scanner (I)**.

Gosselin, Frederick P. (Ec. Pol. de Montréal), Zhou, David (Univ. de Montréal, Pol.), Lalande, Viviane (Ec. Pol. de Montréal), Vonthron, Manuel (École Pol. de Montréal), Martel, Sylvain (Ec. Pol. de Montreal (EPM))

10:00-11:30	TuBPT10.8

*Hybrid Microassembly of Chips on Low Precision Patterns Assisted by Capillary Self-Alignment (I)**.

Chang, Bo (Aalto Univ.), Jääskeläinen, Mirva (Helsinki Univ. of Tech.), Zhou, Quan (Aalto Univ.)

10:00-11:30	TuBPT10.9

*Design and Fabrication of a Novel Resonant Surface Sensitive to Out-Of-Plane Forces for the Indentation and Injection of Living Cells (I)**.

Desmaele, Denis (CEA), Boukallel, Mehdi (CEA), Régnier, Stéphane (Univ. Pierre et Marie Curie)

10:00-11:30	TuBPT10.10

*Robot for Ultrasound-Guided Prostate Imaging and Intervention**.

Kim, Chunwoo (Johns Hopkins Univ.), Chang, Doyoung (Seoul National Univ.), Schäfer, Felix (TWT Science and Innovation GmbH), Petrisor, Doru (Johns Hopkins Univ.), Han, Misop (Johns Hopkins Univ.), Stoianovici, Dan (Johns Hopkins Univ.)

10:00-11:30	TuBPT10.11

*A Modular, Mechatronic Joint Design for a Flexible Access Platform for MIS**.

Noonan, David (Imperial Coll. London), Vitiello, Valentina (Imperial Coll. London), Shang, Jianzhong (Imperial Coll. London), Payne, Christopher (Imperial Coll. London), Yang, Guang-Zhong (Imperial Coll. London)

10:00-11:30	TuBPT10.12

*Development of a "Steerable Drill" for ACL Reconstruction to Create the Arbitrary Trajectory of a Bone Tunnel**.

Watanabe, Hiroki (Waseda Univ.), Kanou, Kazuki (Waseda Univ.), Kobayashi, Yo (Waseda Univ.), Fujie, Masakatsu G. (Waseda Univ.)

10:00-11:30	TuBPT10.13

*Embodiment-Specific Representation of Robot Grasping Using Graphical Models and Latent-Space Discretization**.

Song, Dan (Royal Inst. of Tech. (KTH), Stockholm), Ek, Carl Henrik (Royal Inst. of Tech.), Huebner, Kai (Royal Inst. of Tech. (KTH), Stockholm), Kragic, Danica (KTH)

10:00-11:30	TuBPT10.14

*Grasping Unknown Objects Using an Early Cognitive Vision System for General Scene Understanding**.

Popovic, Mila (Univ. of Southern Denmark), Kootstra, Gert (Royal Inst. of Tech. (KTH), Stockholm), Jørgensen, Jimmy Alison (Univ. of Southern Denmark), Kragic, Danica (KTH), Krüger, Norbert (Univ. of Southern Denmark)

10:00-11:30	TuBPT10.15

*Grasping of Unknown Objects Via Curvature Maximization Using Active Vision**.

Calli, Berk (Delft Univ. of Tech.), Wisse, Martijn (Delft Univ. of Tech.), Jonker, Pieter (Delft Univ. of Tech.)

10:00-11:30	TuBPT10.16

*An Open Source Extensible Software Package to Create Whole-Body Compliant Skills in Personal Mobile Manipulators (I)**.

Philippsen, Roland (Stanford Univ.), Sentis, Luis (The Univ. of Texas at Austin), Khatib, Oussama (Stanford Univ.)

10:00-11:30	TuBPT10.17

*A Component Supervisor for RT-Middleware Using Supervision Trees**.

Biggs, Geoffrey (National Inst. of AIST), Ando, Noriaki (National Inst. of Advanced Industrial ScienceandTechnology), Kotoku, Tetsuo (National Inst. of AIST)

10:00-11:30	TuBPT10.18

*Stream-Oriented Robotics Programming: The Design of Roshask**.

Cowley, Anthony (Univ. of Pennsylvania), Taylor, Camillo Jose (Univ. of Pennsylvania)

10:00-11:30	TuBPT10.19

*Task-Space Control of Extensible Continuum Manipulators**.

Kapadia, Apoorva (Clemson Univ.), Walker, Ian (Clemson Univ.)

10:00-11:30	TuBPT10.20

*Novel Modal Approach for Kinematics of Multisection Continuum Arms**.

Godage, Isuru S. (Istituto Italiano di Tecnologia), Guglielmino, Emanuele (Italian Inst. of Tech.), Branson, David (Istituto Italiano di Tecnologia (IIT)), Medrano-Cerda, Gustavo (Italian Inst. of Tech.), Caldwell, Darwin G. (Italian Inst. of Tech.)

10:00-11:30	TuBPT10.21

*Hardware in the Loop for Optical Flow Sensing in a Robotic Bee**.

Duhamel, Pierre-Emile (Harvard Univ.), Porter, Judson (Harvard Univ.), Finio, Benjamin (Harvard Univ.), Barrows, Geoffrey (Centeye, Inc.), Brooks, David (Harvard Univ.), Wei, Gu-Yeon (Harvard Univ.), Wood, Robert (Harvard Univ.)

10:00-11:30	TuBPT10.22

*A Receding Horizon Approach to Generating Dynamically Feasible Plans for Vehicles That Operate Over Large Areas**.

Stilwell, Daniel (Virginia Tech.), Gadre, Aditya (Virginia Tech.), Kurdila, Andrew (Virginia Tech.)

10:00-11:30	TuBPT10.23

*Planning for Landing Site Selection in the Aerial Supply Delivery**.

Kushleyev, Aleksandr (Univ. of Pennsylvania), Likhachev, Maxim (Carnegie Mellon Univ.), MacAllister, Brian (Univ. of Pennsylvania)

10:00-11:30	TuBPT10.24

*Trajectory Planning with Look-Ahead for Unmanned Sea Surface Vehicles to Handle Environmental Disturbances**.

Svec, Petr (Univ. of Maryland, Coll. Park), Schwartz, Maxim (Energetics Tech. Center), Thakur, Atul (Univ. of Maryland, Coll. Park), Gupta, Satyandra K. (Univ. of Maryland, Coll. Park)

TuPL   Continental Ballroom
Plenary I: Design (Plenary Session)

Chair: Roth, Bernard	Stanford Univ.

12:30-13:45	TuPL.1

Design Plenary*.

Hirose, Shigeo (Tokyo Inst. of Tech.), Hirzinger, Gerd (German Aerospace Center (DLR)), Raibert, Marc (Boston Dynamics)

TuCT1   Continental Parlor 1
Object Detection & Collision Avoidance (Regular Session)

Chair: Zani, Paolo	Univ. of Parma, Italy
Co-Chair: Lien, Jyh-Ming	George Mason Univ.

14:00-14:15	TuCT1.1

Real-Time Bézier Trajectory Deformation for Potential Fields Planning Methods, pp. 1567-1572. Attachment

Hilario Pérez, Lucía (Cardenal Herrera Univ.), Montés Sánchez, Nicolás (Cardenal Herrera Univ.), Mora, Marta Covadonga (Univ. Jaume I), Falcó Montesinos, Antonio (Cardenal Herrera Univ.)

14:15-14:30	TuCT1.2

Fast and Robust 2D Minkowski Sum Using Reduced Convolution, pp. 1573-1578.

Behar, Evan (George Mason Univ.), Lien, Jyh-Ming (George Mason Univ.)

14:30-14:45	TuCT1.3

Positive and Negative Obstacle Detection Using the HLD Classifier, pp. 1579-1584.

Morton, Ryan (Univ. of Michigan), Olson, Edwin (Univ. of Michigan)

14:45-14:50	TuCT1.4

Real-Time Swept Volume and Distance Computation for Self Collision Detection, pp. 1585-1592. Attachment

Täubig, Holger (German Res. Center for Artificial Intelligence), Bäuml, Berthold (German Aerospace Centre), Frese, Udo (Univ. Bremen)

14:50-14:55	TuCT1.5

Visual Navigation with Obstacle Avoidance, pp. 1593-1598. Attachment

Cherubini, Andrea (INRIA Rennes - Bretagne Atlantique), Chaumette, Francois (INRIA Rennes-Bretagne Atlantique)

14:55-15:00	TuCT1.6

Stereo Obstacle Detection in Challenging Environments: The VIAC Experience, pp. 1599-1604.

Broggi, Alberto (Univ. of Parma), Buzzoni, Michele (VisLab - Dipartimento di Ingegneria Dell'Informazione), Felisa, Mirko (Univ. of Parma, Italy), Zani, Paolo (Univ. of Parma, Italy)

15:00-15:15	TuCT1.7

Clustering Obstacle Predictions to Improve Contingency Planning for Autonomous Road Vehicles in Congested Environments, pp. 1605-1611.

Hardy, Jason (Cornell Univ.), Campbell, Mark (Cornell Univ.)

15:15-15:30	TuCT1.8

Time Parametrization of Prioritized Inverse Kinematics Based on Terminal Attractors, pp. 1612-1617. Attachment

Jarquín, Gerardo (CINVESTAV), Arechavaleta, Gustavo (CINVESTAV), Parra Vega, Vicente (CINVESTAV)

TuCT2   Continental Parlor 2
Motion Estimation, Mapping & SLAM (Regular Session)

Chair: Eustice, Ryan	Univ. of Michigan
Co-Chair: Scaramuzza, Davide	Univ. of Pennsylvania

14:00-14:15	TuCT2.1

Stereo Depth Map Fusion for Robot Navigation, pp. 1618-1625. Attachment

Häne, Christian (ETH Zurich), Zach, Christopher (ETH Zurich), Lim, Jongwoo (Google Inc.), Ranganathan, Ananth (Honda Res. Inst. USA), Pollefeys, Marc (ETH Zurich)

14:15-14:30	TuCT2.2

An Embedded Stereo Vision Module for 6D Pose Estimation and Mapping, pp. 1626-1631.

Spampinato, Giacomo (Mälardalen Univ.), Lidholm, Jörgen (Mälardalen Univ.), Ahlberg, Carl (Mälardalen Univ.), Ekstrand, Fredrik (Mälardalen Univ.), Ekström, Mikael (Mälardalen Univ.), Asplund, Lars (Mälardalen Univ.)

14:30-14:45	TuCT2.3

Building Facade Detection, Segmentation, and Parameter Estimation for Mobile Robot Localization and Guidance, pp. 1632-1639.

Delmerico, Jeffrey (SUNY at Buffalo), David, Philip (U.S. Army Res. Lab.), Corso, Jason (SUNY Buffalo)

14:45-14:50	TuCT2.4

A Strategy for Efficient Observation Pruning in Multi-Objective 3D SLAM, pp. 1640-1646.

Valls Miro, Jaime (Univ. of Tech. Sydney), Zhou, Weizhen (Univ. of Tech. Sydney), Dissanayake, Gamini (Univ. of Tech. Sydney)

14:50-14:55	TuCT2.5

Combined Visually and Geometrically Informative Link Hypothesis for Pose-Graph Visual SLAM Using Bag-Of-Words, pp. 1647-1654.

Kim, Ayoung (Univ. of Michigan), Eustice, Ryan (Univ. of Michigan)

14:55-15:00	TuCT2.6

RS-SLAM: RANSAC Sampling for Visual FastSLAM, pp. 1655-1660.

Lee, Gim Hee (ETH Zurich), Fraundorfer, Friedrich (ETH Zurich), Pollefeys, Marc (ETH Zurich)

15:00-15:15	TuCT2.7

3D Surveillance Coverage Using Maps Extracted by a Monocular SLAM Algorithm, pp. 1661-1667.

Doitsidis, Lefteris (Tech. Educational Inst. of Crete & ITI/CERTH), Renzaglia, Alessandro (INRIA), Weiss, Stephan (ETH Zurich), Kosmatopoulos, Elias (Democritus Univ. Thrace & ITI/CERTH), Scaramuzza, Davide (Univ. of Pennsylvania), Siegwart, Roland (ETH Zurich)

15:15-15:30	TuCT2.8

Adaptive Sampling Using Mobile Robotic Sensors, pp. 1668-1673.

Huang, Shuo (Michigan Tech. Univ.), Tan, Jindong (Michigan Tech. Univ.)

TuCT3   Continental Parlor 3
Symposium: Microrobotics III (Invited Session)

Chair: Martel, Sylvain	Ec. Pol. de Montreal (EPM)
Co-Chair: Cappelleri, David	Stevens Inst. of Tech.
Organizer: Martel, Sylvain	Ec. Pol. de Montreal (EPM)
Organizer: Cappelleri, David	Stevens Inst. of Tech.

14:00-14:15	TuCT3.1

Semi-Plenary Invited Talk: Artificial, Biomimetic and Biological Microrobotics*.

Sitti, Metin (Carnegie Mellon Univ.)

14:30-14:45	TuCT3.3

Chemotactic Behavior and Dynamics of Bacteria Propelled Microbeads (I), pp. 1674-1679. Attachment

Kim, Dongwook (Carnegie Mellon Univ.), Liu, Albert (Carnegie Mellon Univ.), Sitti, Metin (Carnegie Mellon Univ.)

14:45-14:50	TuCT3.4

First Leaps Toward Jumping Microrobots (I), pp. 1680-1686. Attachment

Churaman, Wayne (U.S. Army Res. Lab.), Gerratt, Aaron P. (Univ. of Maryland, Coll. Park), Bergbreiter, Sarah (Univ. of Maryland, Coll. Park)

14:50-14:55	TuCT3.5

Micro-Scale Propulsion Using Multiple Flexible Artificial Flagella (I), pp. 1687-1692. Attachment

Singleton, John (Carnegie Mellon Univ.), Diller, Eric D. (Carnegie Mellon Univ.), Andersen, Tim (Carnegie Mellon Univ.), Régnier, Stéphane (Univ. Pierre et Marie Curie), Sitti, Metin (Carnegie Mellon Univ.)

14:55-15:00	TuCT3.6

Smart Manipulation of Multiple Bacteria-Driven Microobjects Based on Bacterial Autonomous Movement, pp. 1693-1698.

Nogawa, Kousuke (Nagoya Univ.), Kojima, Masaru (Nagoya Univ.), Nakajima, Masahiro (Nagoya Univ.), Homma, Michio (Nagoya Univ.), Arai, Fumihito (Nagoya Univ.), Fukuda, Toshio (Nagoya Univ.)

15:00-15:15	TuCT3.7

Precision Evaluation of Modular Multiscale Robots for Peg-In-Hole Microassembly Tasks (I), pp. 1699-1704.

Popa, Dan (The Univ. of Texas at Arlington), Das, Aditya (Univ. of Texas at Arlington)

15:15-15:30	TuCT3.8

Multipoint Sliding Probe Methods for in Situ Electrical Transport Property Characterization of Individual Nanostructures (I), pp. 1705-1710.

Fan, Zheng (Michigan State Univ.), Tao, Xinyong (Zhejiang Univ. of Tech.), Li, Xiaodong (Univ. of South Carolina), Dong, Lixin (Michigan State Univ.)

TuCT5	Continental Ballroom 5
Symposium: Medical Robotics III (Invited Session)	

Chair: Desai, Jaydev P.	Univ. of Maryland
Co-Chair: Fiorini, Paolo	Univ. of Verona
Organizer: Desai, Jaydev P.	Univ. of Maryland
Organizer: Fiorini, Paolo	Univ. of Verona

14:00-14:15	TuCT5.1

Spatial and Temporal Movement Characteristics after Robotic Training of Arm and Hand: A Case Study of a Person with Incomplete Spinal Cord Injury, pp. 1711-1716.

Eng, Dillon (Rice Univ.), Kadivar, Zahra (Baylor Coll. of Medicine), Sullivan, Jenny (Rice Univ.), Pehlivan, Utku (Rice Univ.), O'Malley, Marcia (Rice Univ.), Yozbatiran, Nuray (Univ. of Texas, Houston Medical School), Francisco, Gerald (Univ. of Texas, Houston, Medical School)

14:15-14:30	TuCT5.2

Robotic Rehabilitation System Using Human Hand Trajectory Generation Model in Virtual Curling Task, pp. 1717-1722.

Tanaka, Yoshiyuki (Hiroshima Univ.), Sanemasa, Toru (Hiroshima Univ.), Tsuji, Toshio (Hiroshima Univ.), Imamura, Nobuaki (HIROSHIMA INTERNATIONAL Univ.)

14:30-14:45	TuCT5.3

Simulating Prosthetic Devices with Human-Inspired Hybrid Control, pp. 1723-1730.

Sinnet, Ryan W. (Texas A&M Univ.), Huihua, Zhao (Univ. of Texas A&M), Ames, Aaron (Texas A&M Univ.)

14:45-14:50	TuCT5.4

Dual Predictive Control of Electrically Stimulated Muscle Using Biofeedback for Drop Foot Correction, pp. 1731-1736.

Hayashibe, Mitsuhiro (INRIA), Zhang, Qin (INRIA/UM2), Azevedo Coste, Christine (LIRMM)

14:50-14:55	TuCT5.5

Gait Support for Complete Spinal Cord Injury Patient by Synchronized Leg-Swing with HAL, pp. 1737-1742.

Tsukahara, Atsushi (Univ. of Tsukuba), Hasegawa, Yasuhisa (Univ. of Tsukuba), Sankai, Yoshiyuki (Univ. of Tsukuba)

14:55-15:00	TuCT5.6

A Subject-Based Motion Generation Model with Adjustable Walking Pattern for a Gait Robotic Trainer: NaTUre-Gaits, pp. 1743-1748.

Wang, Ping (Nanyang Tech. Univ.), Low, K. H. (Nanyang Tech. Univ.)

15:00-15:15	TuCT5.7

Knee Joint Movement Assistance through Robust Control of an Actuated Orthosis, pp. 1749-1754. Attachment

Mefoued, Saber (Univ. of Paris Est Créteil (UPEC)), Mohammed, Samer (Univ. of Paris Est Créteil - (UPEC)), Amirat, Yacine (Univ. of Paris Est Créteil (UPEC))

15:15-15:30	TuCT5.8

Stairs-Ascending/Descending Assist for a Lower-Limb Power-Assist Robot Considering ZMP, pp. 1755-1760.

Hayashi, Yoshiaki (Saga Univ.), Kiguchi, Kazuo (Saga Univ.)

TuCT6	Continental Ballroom 6
Symposium: Grasping and Manipulation: Grasp Planning and Quality (Invited Session)	

Chair: Trinkle, Jeff	Rensselaer Pol. Inst.
Co-Chair: Rimon, Elon	Tech. - Israel Inst. of Tech.
Organizer: Dollar, Aaron	Yale Univ.
Organizer: Edsinger, Aaron	Meka Robotics

14:00-14:15	TuCT6.1

Semi-Plenary Invited Talk: Sensorless Grasping with Multiple Contacts and Its Computational Modeling*.

Arimoto, Suguru (Ritsumeikan Univ.)

14:15-14:30	TuCT6.2

The OpenGRASP Benchmarking Suite: An Environment for the Comparative Analysis of Grasping and Dexterous Manipulation, pp. 1761-1767.

Ulbrich, Stefan (Univ. of Karlsruhe (TH)), Kappler, Daniel (Karlsruhe Inst. of Tech.), Asfour, Tamim (Karlsruhe Inst. of Tech. (KIT)), Vahrenkamp, Nikolaus (Karlsruhe Inst. of Tech. (KIT)), Bierbaum, Alexander (KIT - Karlsruhe Inst. of Tech.), Przybylski, Markus (Karlsruhe Inst. of Tech. (KIT)), Dillmann, Rüdiger (KIT Karlsruher Inst. für Tech.)

14:30-14:45	TuCT6.3

Graspability Map: A Tool for Evaluating Grasp Capabilities, pp. 1768-1774.

Roa, Maximo A. (German Aerospace Center, DLR), Hertkorn, Katharina (German Aerospace Center (DLR)), Zacharias, Franziska (German Aerospace Center (DLR)), Borst, Christoph (German Aerospace Center (DLR)), Hirzinger, Gerd (German

Aerospace Center (DLR))

| 14:45-14:50 | TuCT6.4 |

Experimental Evaluation of Postural Synergies During Reach to Grasp with the UB Hand IV, pp. 1775-1780. Attachment

Ficuciello, Fanny (Univ. di Napoli Federico II), Palli, Gianluca (Univ. of Bologna), Melchiorri, Claudio (Univ. of Bologna), Siciliano, Bruno (Univ. Napoli Federico II)

| 14:50-14:55 | TuCT6.5 |

Planning Grasps for Robotic Hands Using a Novel Object Representation Based on the Medial Axis Transform, pp. 1781-1788.

Przybylski, Markus (Karlsruhe Inst. of Tech. (KIT)), Asfour, Tamim (Karlsruhe Inst. of Tech. (KIT)), Dillmann, Rüdiger (KIT Karlsruher Inst. für Tech.)

| 14:55-15:00 | TuCT6.6 |

Exploiting Potential Energy Storage for Cyclic Manipulation: An Analysis for Elastic Dribbling with an Anthropomorphic Robot, pp. 1789-1796. Attachment

Haddadin, Sami (German Aerospace Center (DLR)), Krieger, Kai (German Aerospace Center), Kunze, Mirko (German Aerospace Center), Albu-Schäffer, Alin (DLR - German Aerospace Center)

| 15:00-15:15 | TuCT6.7 |

Prioritized Independent Contact Regions for Form Closure Grasps, pp. 1797-1803.

Krug, Robert (Oerebro Univ.), Dimitrov, Dimitar Nikolaev (Oerebro Univ.), Charusta, Krzysztof Andrzej (Center for Applied Autonomous Sensor Systems Örebro Univ.), Iliev, Boyko (Orebro Univ.)

| 15:15-15:30 | TuCT6.8 |

Abort and Retry in Grasping, pp. 1804-1810.

Rodriguez, Alberto (Carnegie Mellon Univ.), Mason, Matthew T. (Carnegie Mellon Univ.), Srinivasa, Siddhartha (Carnegie Mellon Univ.), Bernstein, Matthew (Carnegie Mellon Univ.), Zirbel, Alex (Carnegie Mellon Univ.)

| **TuCT7** | Continental Parlor 7 |

Mechanisms: Actuator Design (Regular Session)

| Chair: Chen, I-Ming | Nanyang Tech. Univ. |
| Co-Chair: Balasubramanian, Ravi | Yale Univ. |

| 14:00-14:15 | TuCT7.1 |

Stiffness Adjustment of a Series Elastic Actuator in a Knee Prosthesis for Walking and Running: The Trade-Off between Energy and Peak Power Optimization, pp. 1811-1816.

Grimmer, Martin (Univ. of Jena), Seyfarth, Andre (Univ. of Jena)

| 14:15-14:30 | TuCT7.2 |

Static and Dynamic Characteristics of McKibben Pneumatic Actuator for Realization of Stable Robot Motions, pp. 1817-1822.

Sugimoto, Yasuhiro (Osaka Univ.), Naniwa, Keisuke (Kobe Univ.), Osuka, Koichi (Osaka Univ.)

| 14:30-14:45 | TuCT7.3 |

Performance of Serial Underactuated Mechanisms: Number of Degrees of Freedom and Actuators, pp. 1823-1829.

Balasubramanian, Ravi (Yale Univ.), Dollar, Aaron (Yale Univ.)

| 14:45-14:50 | TuCT7.4 |

Variable Radius Pulley Design Methodology for Pneumatic Artificial Muscle-Based Antagonistic Actuation Systems, pp. 1830-1835.

Shin, Dongjun (Stanford Univ.), Yeh, Xiyang (Stanford Univ.), Khatib, Oussama (Stanford Univ.)

| 14:50-14:55 | TuCT7.5 |

Wrist and Forearm Rotation of the DLR Hand Arm System: Mechanical Design, Shape Analysis and Experimental Validation, pp. 1836-1842.

Friedl, Werner (German AerospaceCenter (DLR)), Hoeppner, Hannes (DLR - German Aerospace Center), Petit, Florian (German Aerospace Center (DLR)), Hirzinger, Gerd (German Aerospace Center (DLR))

| 14:55-15:00 | TuCT7.6 |

High-Backdrivable Parallel-Link Manipulator with Continuously Variable Transmission, pp. 1843-1848. Attachment

Tahara, Kenji (Kyushu Univ.), Iwasa, Shingo (Kyushu Univ.), Naba, Shu (Kyushu Univ.), Yamamoto, Motoji (Kyushu Univ.)

| 15:00-15:15 | TuCT7.7 |

Kinematic and Dynamic Analysis of a Novel 6-DOF Serial Manipulator for Underground Distribution Power Lines, pp. 1849-1856.

Allan, Jean-Francois (Hydro-Quebec Res. Inst.), Lavoie, Samuel (Hydro-Quebec Res. Inst.), Reiher, Stephane (Hydro-Quebec Res. Inst.), Lambert, Ghislain (Hydro-Quebec Res. Inst.)

| 15:15-15:30 | TuCT7.8 |

Design of a Static Balancing Mechanism with Unit Gravity Compensators, pp. 1857-1862.

Cho, Changhyun (Chosun Univ.), Kang, Sungchul (Korea Inst. of Science & Tech.)

| **TuCT8** | Continental Parlor 8 |

Reptile & Fish-Inspired Robots (Regular Session)

| Chair: Ishiguro, Akio | Tohoku Univ. |
| Co-Chair: Matsuno, Fumitoshi | Kyoto Univ. |

| 14:00-14:15 | TuCT8.1 |

Learning Fish-Like Swimming with a CPG-Based Locomotion Controller, pp. 1863-1868.

Hu, Yonghui (Beihang Univ.), Tian, Weicheng (Beihang Univ.), Liang, Jianhong (Beihang Univ.), Wang, Tianmiao (Beihang Univ.)

| 14:15-14:30 | TuCT8.2 |

A Self-Tuning Multi-Phase CPG Enabling the Snake Robot to Adapt to Environments, pp. 1869-1874.

Tang, Chaoquan (Shenyang Inst. ofAutomation Chinese Acad. of Sciences), Ma, Shugen (Ritsumeikan Univ.), Li, Bin (Shenyang Inst. of Automation), Wang, Yuechao (Shenyang Inst. of Automation)

| 14:30-14:45 | TuCT8.3 |

Decentralized Control of Multi-Articular Snake-Like Robot for Efficient Locomotion, pp. 1875-1880. Attachment

Kano, Takeshi (Tohoku Univ.), Sato, Takahide (Tohoku Univ.), Kobayashi, Ryo (Hiroshima Univ.), Ishiguro, Akio (Tohoku Univ.)

| 14:45-14:50 | TuCT8.4 |

A Snake-Like Robot Driven by a Decentralized Control That Enables Both Phasic and Tonic Control, pp. 1881-1886. Attachment

Sato, Takahide (Tohoku Univ.), Kano, Takeshi (Tohoku Univ.), Ishiguro, Akio (Tohoku Univ.)

| 14:50-14:55 | TuCT8.5 |

Lizard-Inspired Active Tails Enable Rapid Maneuvers and Dynamic Stabilization in a Terrestrial Robot, pp. 1887-1894. Attachment

Chang-Siu, Evan (Univ. of California, Berkeley), Libby, Tom (Univ. of California, Berkeley), Tomizuka, Masayoshi (Univ. of California), Full, Robert (Univ. of California at Berkeley)

| 14:55-15:00 | TuCT8.6 |

Moving Right Arm in the Right Place: Ophiuroid-Inspired Omnidirectional Robot Driven by Coupled Dynamical Systems, pp. 1895-1900. Attachment

Watanabe, Wataru (Tohoku Univ.), Suzuki, Shota (Tohoku Univ.), Kano, Takeshi (Tohoku Univ.), Ishiguro, Akio (Tohoku Univ.)

15:00-15:15	TuCT8.7

Multi-Physics Model of an Electric Fish-Like Robot : Numerical Aspects and Application to Obstacle Avoidance, pp. 1901-1906.

Porez, Mathieu (IRCCyN), Lebastard, Vincent (Ec. des Mines de Nantes), Ijspeert, Auke (EPFL), Boyer, Frédéric (Ec. des Mines de Nantes)

15:15-15:30	TuCT8.8

Front-Unit-Following Control of a Snake-Like Robot Using Screw Drive Mechanism Based on past Velocity Commands, pp. 1907-1912.

Ariizumi, Ryo (Kyoto Univ.), Fukushima, Hiroaki (Kyoto Univ.), Matsuno, Fumitoshi (Kyoto Univ.)

TuCT9	Continental Parlor 9
Novel Sensors (Regular Session)	
Chair: Floreano, Dario	Ec. Pol. Federal, Lausanne
Co-Chair: Meek, Sanford	Univ. of Utah

14:00-14:15	TuCT9.1

Contactless Deflection Sensor for Soft Robots, pp. 1913-1918.

Dobrzynski, Michal Karol (Ec. Pol. Federal, Lausanne), Pericet-Camara, Ramon (Ec. Pol. Federal, Lausanne), Floreano, Dario (Ec. Pol. Federal, Lausanne)

14:15-14:30	TuCT9.2

Soft Curvature Sensors for Joint Angle Proprioception, pp. 1919-1926.

Kramer, Rebecca (Harvard Univ.), Majidi, Carmel (Harvard Univ.), Sahai, Ranjana (Harvard Univ.), Wood, Robert (Harvard Univ.)

14:30-14:45	TuCT9.3

Characterizing the Performance of an Optical Slip Sensor for Grip Control in a Prosthesis, pp. 1927-1932.

Sani, Hamidreza (Univ. of Utah), Meek, Sanford (Univ. of Utah)

14:45-14:50	TuCT9.4

DLR VR-SCAN: A Versatile and Robust Miniaturized Laser Scanner for Short Range 3D-Modelling and Exploration in Robotics, pp. 1933-1939.

Kielhöfer, Simon (German Aerospace Center (DLR)), Bahls, Thomas (German Aerospace Center), Hacker, Franz (Deutsches Zentrum für Luft- und Raumfahrt e.V. (DLR)), Wüsthoff, Tilo (DLR), Suppa, Michael (German Aerospace Center (DLR))

14:50-14:55	TuCT9.5

Piezoelectric Self-Sensing Technique for Tweezer Style End-Effector, pp. 1940-1945.

McPherson, Timothy (Georgia Inst. of Tech.), Ueda, Jun (Georgia Inst. of Tech.)

14:55-15:00	TuCT9.6

Development of a Fabric Sensor Using Tension-Sensitive Electro-Conductive Yarns in Recognition of Slippage, pp. 1946-1953.

Ho, Van (Ritsumeikan Univ.), Kondo, Daisuke (Graduate School of Science and Engineering), Okada, Shima (Graduate School of Science and Engineering, Ritsumeikan Univ.), Araki, Takahiro (Res. and Development Div. Okamoto Corp.), Fujita, Emi (Res. and Development Div. Okamoto Corp.), Makikawa, Masaaki (Coll. of Science and Engineering, Ritsumeikan Univ.), Hirai, Shinichi (Ritsumeikan Univ.)

15:00-15:15	TuCT9.7

Development of Omni-Directional and Fast-Responsive Net-Structure Proximity Sensor, pp. 1954-1961.

Terada, Kazuki (the Univ. of Electro-Communications), Suzuki, Yosuke (The Univ. of Electro-Communications), Hasegawa, Hiroaki (the Univ. of Electro-Communications), Sone, Satoshi (The Univ. of Electro-Communications), Ming, Aiguo (The Univ. of Electro-Communications), Ishikawa, Masatoshi (Univ. of Tokyo), Shimojo, Makoto (Univ. of Electro-COmmunications)

15:15-15:30	TuCT9.8

Design of a Compact Camera-Orienting Mechanism with Flexural Pan and Tilt Axes, pp. 1962-1967.

Lan, Chao-Chieh (National Cheng Kung Univ.), Lee, Yi-Chiao (National Cheng Kung Univ.), Jiang, Jinn-Feng (Metal Industries Res. and Development Centre), Chen, Yi-Jie (Metal Industries Res. and Development Centre), Wei, Hung-Yuan (Metal Industries Res. & Development Centre)

TuCPT10	Golden Gate Room
Interactive IV (Interactive Session)	

14:00-15:30	TuCPT10.1

Novelty Detection Using Growing Neural Gas for Visuo-Spatial Memory*.

Kit, Dmitry (Univ. of Texas at Austin), Sullivan, Brian (Univ. of Texas at Austin), Ballard, Dana (The Univ. of Texas at Austin)

14:00-15:30	TuCPT10.2

Coherent Spatial Abstraction and Stereo Line Detection for Robotic Visual Attention*.

Zhou, Kai (Automation and Control Inst. Vienna Univ. of Tech.), Richtsfeld, Andreas (Vienna Univ. of Tech.), Zillich, Michael (Vienna Univ. of Tech.), Vincze, Markus (Vienna Univ. of Tech.)

14:00-15:30	TuCPT10.3

Visual Machinery Surveillance for High-Speed Periodic Operations*.

Ishii, Idaku (Hiroshima Univ.), Wang, Yao-Dong (Hiroshima Univ.), Takaki, Takeshi (Hiroshima Univ.)

14:00-15:30	TuCPT10.4

Place Recognition in 3D Scans Using a Combination of Bag of Words and Point Feature Based Relative Pose Estimation*.

Steder, Bastian (Univ. of Freiburg), Ruhnke, Michael (Univ. of Freiburg), Grzonka, Slawomir (Albert-Ludwigs-Univ. of Freiburg), Burgard, Wolfram (Univ. of Freiburg)

14:00-15:30	TuCPT10.5

Adaptive Appearance Based Loop-Closing in Heterogeneous Environments*.

Majdik, Andras (Tech. Univ. of Cluj-Napoca), Galvez Lopez, Dorian (Univ. de Zaragoza), Lazea Gheorghe, Gheorghe (Tech. Univ. of Cluj-Napoca), Castellanos, Jose A. (Univ. of Zaragoza)

14:00-15:30	TuCPT10.6

Simultaneous Localization and Mapping with Learned Object Recognition and Semantic Data Association*.

Rogers III, John G. (Georgia Inst. of Tech.), Trevor, Alexander J B (Georgia Inst. of Tech.), Nieto-Granda, Carlos (Georgia Inst. of Tech.), Christensen, Henrik Iskov (Georgia Inst. of Tech.)

14:00-15:30	TuCPT10.7

Rotating Magnetic Micro-Robots for Versatile Non-Contact Fluidic Manipulation of Micro-Objects (I)*.

Diller, Eric D. (Carnegie Mellon Univ.), Ye, Zhou (Carnegie Mellon Univ.), Sitti, Metin (Carnegie Mellon Univ.)

14:00-15:30	TuCPT10.8

MRI Magnetic Signature Imaging, Tracking and Navigation for Targeted Micro/Nano-Capsule Therapeutics (I)*.

Folio, David (ENSI de Bourges), Dahmen, Christian (Univ. of Oldenburg), Wortmann, Tim (Univ. of Oldenburg), Zeeshan, Arif Muhammad (ETH Zurich), Shou, Kaiyu (Swiss Federal Inst. of Tech. Zurich (ETH Zurich)), Pane, Salvador (ETH Zurich), Nelson, Bradley J. (ETH Zurich), Ferreira, Antoine (ENSI Bourges),

Fatikow, Sergej (Univ. of Oldenburg)

| 14:00-15:30 | TuCPT10.9 |

Tumor Targeting by Computer Controlled Guidance of Magnetotactic Bacteria Acting Like Autonomous Microrobots (I).

Felfoul, Ouajdi (Ec. Pol. de Montreal (EPM)), Mohammadi, Mahmood (Ec. Pol. de Montreal (EPM)), Gaboury, Louis (Department of Pathology and Cell Biology, Faculty of Medicine, Univ. de Montréal), Martel, Sylvain (Ec. Pol. de Montreal (EPM))

| 14:00-15:30 | TuCPT10.10 |

Ergonomic and Gesture Performance of Robotized Instruments for Laparoscopic Surgery.

Herman, Benoît (Univ. catholique de Louvain), Hassan Zahraee, Ali (Univ. Pierre et Marie Curie - Paris 6), Szewczyk, Jérôme (Univ. Pierre et Marie Curie-Paris 6), Morel, Guillaume (Univ. Pierre et Marie Curie - Paris 6), Bourdin, Christophe (CNRS UMR 6233), Vercher, Jean-Louis (CNRS UMR 6233), Gayet, Brice (Univ. Paris Descartes)

| 14:00-15:30 | TuCPT10.11 |

Laparoscopic Optical Biopsies: In Vivo Robotized Mosaicing with Probe-Based Confocal Endomicroscopy.

Rosa, Benoît (Univ. Pierre et Marie Curie - Paris 6), Herman, Benoît (Univ. catholique de Louvain), Szewczyk, Jérôme (Univ. Pierre et Marie Curie-Paris 6), Gayet, Brice (Univ. Paris Descartes), Morel, Guillaume (Univ. Pierre et Marie Curie - Paris 6)

| 14:00-15:30 | TuCPT10.12 |

Sensor and Sampling-Based Motion Planning for Minimally Invasive Robotic Exploration of Osteolytic Lesions.

Liu, Wen (Johns Hopkins Univ.), Lucas, Blake (Johns Hopkins Univ.), Guerin, Kelleher (Johns Hopkins Univ.), Plaku, Erion (Catholic Univ. of America)

| 14:00-15:30 | TuCPT10.13 |

Varying Spring Preloads to Select Grasp Strategies in an Adaptive Hand.

Aukes, Daniel (Stanford Univ.), Heyneman, Barrett (Stanford Univ.), Duchaine, Vincent (Univ. Laval), Cutkosky, Mark (Stanford Univ.)

| 14:00-15:30 | TuCPT10.14 |

A Highly-Underactuated Robotic Hand with Force and Joint Angle Sensors.

Wang, Long (Columbia Univ.), DelPreto, Joseph (Columbia Univ.), Bhattacharyya, Samrat (Vanderbilt Univ.), Weisz, Jonathan (Columbia Univ.), Allen, Peter (Columbia Univ.)

| 14:00-15:30 | TuCPT10.15 |

Active Outline Shaping of a Rheological Object Based on Plastic Deformation Distribution.

Yoshimoto, Kayo (Osaka Univ.), Higashimori, Mitsuru (Osaka Univ.), Tadakuma, Kenjiro (Osaka Univ.), Kaneko, Makoto (Osaka Univ.)

| 14:00-15:30 | TuCPT10.16 |

Bi-Manual Robotic Paper Manipulation Based on Real-Time Marker Tracking and Physical Modelling.

Elbrechter, Christof (Bielefeld Univ.), Haschke, Robert (Bielefeld Univ.), Ritter, Helge Joachim (Bielefeld Univ.)

| 14:00-15:30 | TuCPT10.17 |

Understanding the Difference between Prox and Complementarity Formulations for Simulation of Systems with Contact.

Schindler, Thorsten (INRIA Grenoble - Rhône-Alpes), Nguyen, Binh (Rensselaer Pol. Inst.), Trinkle, Jeff (Rensselaer Pol. Inst.)

| 14:00-15:30 | TuCPT10.18 |

Curved Surface Contact Patches with Quantified Uncertainty.

Vona, Marsette (Northeastern Univ.), Kanoulas, Dimitrios (Northeastern Univ.)

| 14:00-15:30 | TuCPT10.19 |

Passive Undulatory Gaits Enhance Walking in a Myriapod Millirobot.

Hoffman, Katie (Harvard Univ.), Wood, Robert (Harvard Univ.)

| 14:00-15:30 | TuCPT10.20 |

Mechanical Design of a Tree Gripper for Miniature Tree-Climbing Robots.

Lam, Tin Lun (The Chinese Univ. of Hong Kong / Shenzhen Inst. of Advanced Tech.), Xu, Yangsheng (Chinese Univ. of Hong Kong /ShenzhenInstituteofAdvanced Tech.)

| 14:00-15:30 | TuCPT10.21 |

Bio-Inspired Step Crossing Algorithm for a Hexapod Robot.

Chou, Ya-Cheng (National Taiwan Univ.), Yu, Wei-Shun (National Taiwan Univ.), Huang, Ke Jung (National Taiwan Univ.), Lin, Pei-Chun (National Taiwan Univ.)

| 14:00-15:30 | TuCPT10.22 |

Active Learning Using a Variational Dirichlet Process Model for Pre-Clustering and Classification of Underwater Stereo Imagery.

Friedman, Ariell (Univ. of Sydney), Steinberg, Daniel (The Univ. of Sydney), Pizarro, Oscar (Australian Centre for Field Robotics), Williams, Stefan Bernard (Univ. of Sydney)

| 14:00-15:30 | TuCPT10.23 |

Autonomous Acquisition of Multimodal Information for Online Object Concept Formation by Robots.

Araki, Takaya (Univ. of Electro-Communications), Nakamura, Tomoaki (Univ. of Electro-Communications), Nagai, Takayuki (Univ. of Electro-Communications), Funakoshi, Kotaro (Honda Res. Inst. Japan Co., Ltd.), Nakano, Mikio (Honda Res. Inst. Japan), Iwahashi, Naoto (National Inst. ofInformationandCommunicationsTechnology)

| 14:00-15:30 | TuCPT10.24 |

Learning Robot Grasping from 3-D Images with Markov Random Fields.

Boularias, Abdeslam (Max Planck Inst. for Intelligent Systems), Kroemer, Oliver (Max-Planck Inst. for Biological Cybernetics), Peters, Jan (Darmstadt Univ. of Tech.)

WeAT1	Continental Parlor 1
HRI: Modeling Human Behavior (Regular Session)	

Chair: Arras, Kai Oliver	Univ. of Freiburg
Co-Chair: Campos, Mario F. Montenegro	Univ. Federal de Minas Gerais

08:00-08:15	WeAT1.1

Please Do Not Disturb! Minimum Interference Coverage for Social Robots, pp. 1968-1973.

Tipaldi, Gian Diego (Univ. of Freiburg), Arras, Kai Oliver (Univ. of Freiburg)

08:15-08:30	WeAT1.2

Shall We Dance? a Music-Driven Approach for Mobile Robots Choreography, pp. 1974-1979.

Sousa Junior, Samuel Felix de (Univ. Federal de Minas Gerais), Campos, Mario F. Montenegro (Univ. Federal de Minas Gerais)

08:30-08:45	WeAT1.3

Generalising Human Demonstration Data by Identifying Affordance Symmetries in Object Interaction Trajectories, pp. 1980-1985.

Claassens, Jonathan (CSIR), Demiris, Yiannis (Imperial Coll. London)

08:45-08:50	WeAT1.4

Human Preferences for Robot-Human Hand-Over Configurations, pp. 1986-1993. Attachment

Cakmak, Maya (Georgia Inst. of Tech.), Srinivasa, Siddhartha (Carnegie Mellon Univ.), Lee, Min Kyung (Carnegie Mellon Univ.), Forlizzi, Jodi (Carnegie Mellon Univ.), Kiesler, Sara (Carnegie Mellon Univ.)

08:50-08:55	WeAT1.5

Did You See It Hesitate? – Empirically Grounded Design of Hesitation Trajectories for Collaborative Robots, pp. 1994-1999.

Moon, AJung (Univ. of British Columbia), Parker, Chris (Univ. of British Columbia), Croft, Elizabeth (Univ. of British Columbia), Van der Loos, H.F. Machiel (Univ. of British Columbia (UBC))

08:55-09:00	WeAT1.6

VocaWather: Natural Singing Motion Generator for a Humanoid Robot, pp. 2000-2007.

Kajita, Shuuji (National Inst. of AIST), Nakano, Tomoyasu (National Inst. of AIST), Goto, Masataka (National Inst. of Advanced Industrial Science and Tech.), Matsusaka, Yosuke (National Inst. of Advanced Industrial Science andTechnology), Nakaoka, Shin'ichiro (AIST), Yokoi, Kazuhito (National Inst. of AIST)

09:00-09:15	WeAT1.7

Towards an Understanding of Dancers' Coupled Body Dynamics for Waltz, pp. 2008-2013.

Wang, Hongbo (Tohoku Univ.), Kosuge, Kazuhiro (Tohoku Univ.)

09:15-09:30	WeAT1.8

Understanding Human Interaction for Probabilistic Autonomous Navigation, pp. 2014-2019.

Rios-Martinez, Jorge (INRIA Rhone-Alpes), Spalanzani, Anne (INRIA / UPMF-Grenoble 2), Laugier, Christian (INRIA Rhône-Alpes)

WeAT2	Continental Parlor 2
Models and Representation (Regular Session)	

Chair: Parker, Lynne	Univ. of Tennessee
Co-Chair: Schlegel, Christian	Univ. of Applied Sciences Ulm

08:00-08:15	WeAT2.1

Denoising of Range Images Using a Trilateral Filter and Belief Propagation, pp. 2020-2027.

Oishi, Shuji (Kyushu Univ.), Kurazume, Ryo (Kyushu Univ.), Iwashita, Yumi (Kyushu Univ.), Hasegawa, Tsutomu (Kyushu Univ.)

08:15-08:30	WeAT2.2

Representing Actions with Kernels, pp. 2028-2035.

Luo, Guoliang (KTH - Royal Inst. of Tech.), Bergström, Niklas (KTH), Ek, Carl Henrik (Royal Inst. of Tech.), Kragic, Danica (KTH)

08:30-08:45	WeAT2.3

3D Crowd Surveillance and Analysis Using Laser Range Scanners, pp. 2036-2043.

Shao, Xiaowei (Univ. of Tokyo), Zhao, Huijing (Peking Univ.), Shibasaki, Ryosuke (Univ. of Tokyo), Shi, Yun (Center for Spatial Information Science, Univ. of Tokyo), Sakamoto, Kiyoshi (Res. and Development Center, East Japan Railway Company)

08:45-08:50	WeAT2.4

4-Dimensional Local Spatio-Temporal Features for Human Activity Recognition, pp. 2044-2049.

Zhang, Hao (Univ. of Tennessee), Parker, Lynne (Univ. of Tennessee)

08:50-08:55	WeAT2.5

Fitting Conics to Noisy Data Using Stochastic Linearization, pp. 2050-2055.

Baum, Marcus (Karlsruhe Inst. of Tech. (KIT)), Hanebeck, Uwe D. (Karlsruhe Inst. of Tech. (KIT))

08:55-09:00	WeAT2.6

Bootstrapping Sensorimotor Cascades: A Group-Theoretic Perspective, pp. 2056-2063.

Censi, Andrea (California Inst. of Tech.), Murray, Richard (California Inst. of Tech.)

09:00-09:15	WeAT2.7

Managing Execution Variants in Task Coordination by Exploiting Design-Time Models at Run-Time, pp. 2064-2069.

Steck, Andreas (Univ. of Applied Sciences Ulm), Schlegel, Christian (Univ. of Applied Sciences Ulm)

09:15-09:30	WeAT2.8

The Mathematical Model and Control of Human-Machine Perceptual Feedback System, pp. 2070-2075.

Yoon, Han (Univ. of Illinois at Urbana-Champaign), Hutchinson, Seth (Univ. of Illinois)

WeAT3	Continental Parlor 3
Medical Robotics: Tracking & Detection (Regular Session)	

Chair: Stramigioli, Stefano	Univ. of Twente
Co-Chair: Plaku, Erion	Catholic Univ. of America

08:00-08:15	WeAT3.1

Three-Dimensional Pose Reconstruction of Flexible Instruments from Endoscopic Images, pp. 2076-2082.

Reilink, Rob (Univ. of Twente), Stramigioli, Stefano (Univ. of Twente), Misra, Sarthak (Univ. of Twente)

08:15-08:30	WeAT3.2

Detection of Curved Robots Using 3D Ultrasound, pp. 2083-2089.

Ren, Hongliang (Harvard Univ.), Vasilyev, Nikolay (Children's Hospital Boston and Harvard Medical School), Dupont, Pierre (Children's Hospital Boston, Harvard Medical School)

08:30-08:45	WeAT3.3

Comparison of Several Image Features for WCE Video Abstract, pp. 2090-2095.

Li, Baopu (Chinese Univ. of Hong Kong), Meng, Max Q.-H. (The Chinese Univ. of Hong Kong)

08:45-08:50	WeAT3.4

Toward Development of 3D Surgical Mouse Paradigm, pp. 2096-2101.

Sun, Xiaochuan (Simon Fraser Univ.), Payandeh, Shahram (Simon Fraser Univ.)

08:50-08:55	WeAT3.5

3D Thread Tracking for Robotic Assistance in Tele-Surgery, pp. 2102-2107. Attachment

Padoy, Nicolas (Johns Hopkins Univ.), Hager, Gregory (Johns Hopkins Univ.)

08:55-09:00	WeAT3.6

Ultrasound Image Features of the Wrist Are Linearly Related to Finger Positions, pp. 2108-2114. Attachment

Castellini, Claudio (DLR - German Aerospace Res. Center), Passig, Georg (German Aerospace Center)

09:00-09:15	WeAT3.7

In-Vitro Three Dimensional Vasculature Modeling Based on Sensor Fusion between Intravascular Ultrasound and Magnetic Tracker, pp. 2115-2120.

Shi, Chaoyang (Nagoya Univ.), Tercero Villagran, Carlos Rafael (Nagoya Univ.), Ikeda, Seiichi (Nagoya Univ.), Fukuda, Toshio (Nagoya Univ.), Komori, Kimihiro (Nagoya Univ.), Yamamoto, Kiyohito (Nagoya Univ.)

09:15-09:30	WeAT3.8

Surgical Tools Pose Estimation for a Multimodal HMI of a Surgical Robotic Assistant, pp. 2121-2126.

Estebanez, Belen (Univ. de Málaga), Bauzano, Enrique (Univ. of Malaga, Spain), Muñoz, Victor (Univ. of Malaga)

WeAT4	Continental Ballroom 4

Symposium: Haptics Interfaces for the Fingertip, Hand, and Arm (Invited Session)

Chair: Kuchenbecker, Katherine J.	Univ. of Pennsylvania
Co-Chair: O'Malley, Marcia	Rice Univ.
Organizer: O'Malley, Marcia	Rice Univ.
Organizer: Kuchenbecker, Katherine J.	Univ. of Pennsylvania
Organizer: Yokokohji, Yasuyoshi	Kobe Univ.

08:00-08:15	WeAT4.1

Semi-Plenary Invited Talk: Surface Haptics: Virtual Touch on Physical Surfaces.

Colgate, Edward (Northwestern Univ.)

08:30-08:45	WeAT4.3

Weight and Friction Display Device by Controlling the Slip Condition of a Fingertip, pp. 2127-2132.

Kurita, Yuichi (Hiroshima Univ.), Yonezawa, Satoshi (Nara Inst. of Science and Tech.), Ikeda, Atsutoshi (Nara Inst. of Science and Tech.), Ogasawara, Tsukasa (Nara Inst. of Science and Tech.)

08:45-08:50	WeAT4.4

On-Line Bio-Impedance Identification of Fingertip Skin for Enhancement of Electrotactile Based Haptic Rendering, pp. 2133-2138.

Gregory, John (Michigan State Univ.), Shen, Yantao (Univ. of Nevada, Reno), Xi, Ning (Michigan State Univ.)

08:50-08:55	WeAT4.5

Design of an MRI Compatible Haptic Interface, pp. 2139-2144.

Turkseven, Melih (Georgia Inst. of Tech.), Ueda, Jun (Georgia Inst. of Tech.)

08:55-09:00	WeAT4.6

Force Producibility Improvement of Redundant Parallel Mechanism for Haptic Applications, pp. 2145-2150. Attachment

Arata, Jumpei (Nagoya Insititute of Tech.), Ikedo, Norio (Nagoya Inst. of Tech.), Fujimoto, Hideo (Nagoya Inst. of Tech.)

09:00-09:15	WeAT4.7

Wide-Bandwidth Bilateral Control Using Two Stage Actuator Systems: Evaluation Results of a Prototype, pp. 2151-2157. Attachment

Kokuryu, Saori (Tokyo Denki Univ.), Izutsu, Masaki (Tokyo Denki Univ.), Kamamichi, Norihiro (Tokyo Denki Univ.), Ishikawa, Jun (Tokyo Denki Univ.)

09:15-09:30	WeAT4.8

A New Generation of Ergonomic Exoskeletons – the High-Performance X-Arm-2 for Space Robotics Telepresence, pp. 2158-2165.

Schiele, Andre (European Space Agency), Hirzinger, Gerd (German Aerospace Center (DLR))

WeAT5	Continental Ballroom 5

Symposium: Robot Motion Planning: Achievements and Emerging Approaches (Invited Session)

Chair: Alterovitz, Ron	Univ. of North Carolina at Chapel Hill
Co-Chair: Likhachev, Maxim	Carnegie Mellon Univ.
Organizer: Alterovitz, Ron	Univ. of North Carolina at Chapel Hill
Organizer: Likhachev, Maxim	Carnegie Mellon Univ.

08:00-08:15	WeAT5.1

Semi-Plenary Invited Talk: 50 Years of Robotics: Motion Planning.

Lozano-Perez, Tomas (MIT)

08:30-08:45	WeAT5.3

Conflict-Free Route Planning in Dynamic Environments (I), pp. 2166-2171.

ter Mors, Adriaan W. (Delft Univ. of Tech.)

08:45-08:50	WeAT5.4

Kinodynamic Motion Planning with State Lattice Motion Primitives (I), pp. 2172-2179. Attachment

Pivtoraiko, Mihail (Carnegie Mellon Univ.), Kelly, Alonzo (Carnegie Mellon Univ.)

08:50-08:55	WeAT5.5

Efficient Motion Planning for Manipulation Robots in Environments with Deformable Objects (I), pp. 2180-2185.

Frank, Barbara (Univ. of Freiburg), Stachniss, Cyrill (Univ. of Freiburg), Abdo, Nichola (Univ. of Freiburg), Burgard, Wolfram (Univ. of Freiburg)

08:55-09:00	WeAT5.6

Learning Dimensional Descent Planning for a Highly-Articulated Robot Arm (I), pp. 2186-2191. Attachment

Vernaza, Paul (Univ. of Pennsylvania), Lee, Daniel D. (Univ. of Pennsylvania)

09:00-09:15	WeAT5.7

A Simplified Model of RRT Coverage for Kinematic Systems (I), pp. 2192-2198.

Esposito, Joel (US Naval Acad.)

| 09:15-09:30 | WeAT5.8 |

Space-Filling Trees : A New Perspective on Motion Planning Via Incremental Search (I), pp. 2199-2206.

Kuffner, James (Carnegie Mellon Univ.), LaValle, Steven M (Univ. of Illinois)

| **WeAT6** | Continental Ballroom 6 |

Symposium: Aerial Robotics: Estimation, Perception and Control (Invited Session)

Chair: Michael, Nathan	Univ. of Pennsylvania
Co-Chair: Abbeel, Pieter	UC Berkeley
Organizer: Michael, Nathan	Univ. of Pennsylvania
Organizer: Abbeel, Pieter	UC Berkeley
Organizer: Saripalli, Srikanth	Arizona State Univ.

| 08:00-08:15 | WeAT6.1 |

Semi-Plenary Invited Talk: Do It Yourself Drones*.

Anderson, Chris (Wired Magazine)

| 08:30-08:45 | WeAT6.3 |

Multiple-Objective Motion Planning for Unmanned Aerial Vehicles (I), pp. 2207-2214. Attachment

Scherer, Sebastian (Carnegie Mellon Univ.), Singh, Sanjiv (Carnegie Mellon Univ.)

| 08:45-08:50 | WeAT6.4 |

Bilateral Teleoperation of Multiple UAVs with Decentralized Bearing-Only Formation Control (I), pp. 2215-2222. Attachment

Franchi, Antonio (Max Planck Inst. for Biological Cybernetics), Masone, Carlo (Max Planck Inst. for Biological Cybernetics), Buelthoff, Heinrich H. (Max Planck Inst. for Biol. Cybernetics), Robuffo Giordano, Paolo (Max Planck Inst. for Biological Cybernetics)

| 08:50-08:55 | WeAT6.5 |

Modeling and Decoupling Control of the CoaX Micro Helicopter (I), pp. 2223-2228. Attachment

Fankhauser, Peter (ETH Zurich), Bouabdallah, Samir (Swiss Federal Inst. of Tech.), Leutenegger, Stefan (Swiss Federal Inst. of Tech. Zurich), Siegwart, Roland (ETH Zurich)

| 08:55-09:00 | WeAT6.6 |

On Active Target Tracking and Cooperative Localization for Multiple Aerial Vehicles (I), pp. 2229-2234.

Morbidi, Fabio (Univ. of Texas at Arlington), Mariottini, Gian Luca (Univ. of Texas at Arlington)

| 09:00-09:15 | WeAT6.7 |

Deterministic Initialization of Metric State Estimation Filters for Loosely-Coupled Monocular Vision-Inertial Systems (I), pp. 2235-2241.

Kneip, Laurent (ETHZ), Weiss, Stephan (ETH Zurich), Siegwart, Roland (ETH Zurich)

| 09:15-09:30 | WeAT6.8 |

Collaborative Stereo (I), pp. 2242-2248.

Achtelik, Markus W. (ETH Zurich, Autonomous Systems Lab.), Weiss, Stephan (ETH Zurich), Chli, Margarita (ETH Zurich), Dellaert, Frank (Georgia Inst. of Tech.), Siegwart, Roland (ETH Zurich)

| **WeAT7** | Continental Parlor 7 |

Robot Walking (Regular Session)

| Chair: Sentis, Luis | The Univ. of Texas at Austin |
| Co-Chair: Aoi, Shinya | Kyoto Univ. |

| 08:00-08:15 | WeAT7.1 |

Self-Stabilization Principle of Mechanical Energy Inherent in Passive Compass Gait, pp. 2249-2254.

Asano, Fumihiko (Japan Advanced Inst. of Science and Tech.)

| 08:15-08:30 | WeAT7.2 |

Model-Based Velocity Control for Limit Cycle Walking, pp. 2255-2260.

Haarnoja, Tuomas (VTT Tech. Res. Centre of Finland), Peralta Cabezas, José Luis (Aalto), Halme, Aarne J. (Helsinki Univ. of Tech.)

| 08:30-08:45 | WeAT7.3 |

A Walking Stability Controller with Disturbance Rejection Based on CMP Criterion and Ground Reaction Force Feedback, pp. 2261-2266.

Beranek, Richard (Carleton Univ.), Fung, Henry (Carleton Univ.), Ahmadi, Mojtaba (Carleton Univ.)

| 08:45-08:50 | WeAT7.4 |

Perturbation Theory to Plan Dynamic Locomotion in Very Rough Terrains, pp. 2267-2273. Attachment

Sentis, Luis (The Univ. of Texas at Austin), Fernandez, Benito R. (The Univ. of Texas at Austin)

| 08:50-08:55 | WeAT7.5 |

Generation of Adaptive Splitbelt Treadmill Walking by a Biped Robot Using Nonlinear Oscillators with Phase Resetting, pp. 2274-2279. Attachment

Aoi, Shinya (Kyoto Univ.), Fujiki, Soichiro (Kyoto Univ.), Yamashita, Tsuyoshi (Kyoto Univ.), Kohda, Takehisa (Kyoto Univ.), Senda, Kei (Kyoto Univ.), Tsuchiya, Kazuo (Kyoto Univ.)

| 08:55-09:00 | WeAT7.6 |

Experimental Verification of Hysteresis in Gait Transition of a Quadruped Robot Driven by Nonlinear Oscillators with Phase Resetting, pp. 2280-2285. Attachment

Aoi, Shinya (Kyoto Univ.), Fujiki, Soichiro (Kyoto Univ.), Katayama, Daiki (Kyoto Univ.), Yamashita, Tsuyoshi (Kyoto Univ.), Kohda, Takehisa (Kyoto Univ.), Senda, Kei (Kyoto Univ.), Tsuchiya, Kazuo (Kyoto Univ.)

| 09:00-09:15 | WeAT7.7 |

Multi-Objective Parameter CPG Optimization for Gait Generation of a Quadruped Robot Considering Behavioral Diversity, pp. 2286-2291. Attachment

Oliveira, Miguel (Minho Univ.), Santos, Cristina (Univ. of Minho), Costa, Lino (Univ. of Minho), Matos, Vítor (Univ. of Minho), Ferreira, Manuel (Univ. of Minho)

| 09:15-09:30 | WeAT7.8 |

A Sparse Model Predictive Control Formulation for Walking Motion Generation, pp. 2292-2299.

Dimitrov, Dimitar Nikolaev (Orebro Univ.), Sherikov, Aleksander (Orebro Univ.), Wieber, Pierre-Brice (INRIA Rhône-Alpes)

| **WeAT8** | Continental Parlor 8 |

Networked Robots (Regular Session)

| Chair: Lee, C. S. George | Purdue Univ. |
| Co-Chair: Lumia, Ron | Univ. of New Mexico |

| 08:00-08:15 | WeAT8.1 |

Mobility and Routing Joint Design for Lifetime Maximization in Mobile Sensor Networks, pp. 2300-2305.

Yu, Shengwei (Purdue Univ.), Lee, C. S. George (Purdue Univ.)

| 08:15-08:30 | WeAT8.2 |

Decentralized Multi-Vehicle Path Coordination under Communication Constraints, pp. 2306-2313.

Abichandani, Pramod (Drexel Univ.), Benson, Hande (Drexel

Univ.), Kam, Moshe (Drexel Univ.)

08:30-08:45	WeAT8.3

Optimal Maintenance Strategy in Fault-Tolerant Multi-Robot Systems, pp. 2314-2320.

Hoshino, Satoshi (Tokyo Inst. of Tech.), Seki, Hiroya (Tokyo Inst. of Tech.), Ota, Jun (The Univ. of Tokyo)

08:45-08:50	WeAT8.4

Distributed Control of Multi-Robot Systems with Global Connectivity Maintenance, pp. 2321-2326. Attachment

Sabattini, Lorenzo (Univ. of Modena and Reggio Emilia), Chopra, Nikhil (Univ. of Maryland, Coll. Park), Secchi, Cristian (Univ. of Modena & Reggio Emilia)

08:50-08:55	WeAT8.5

RSSI-Based Physical Layout Classification and Target Tethering in Mobile Ad-Hoc Networks, pp. 2327-2332. Attachment

Reddy, Prashant (Carnegie Mellon Univ.), Veloso, Manuela (Carnegie Mellon Univ.)

08:55-09:00	WeAT8.6

Heterogeneous Sensor Network for Prioritized Sensing, pp. 2333-2339.

Cortez, Andres (Univ. of New Mexico), Fierro, Rafael (Univ. of New Mexico), Wood, John (Univ. of New Mexico), Lumia, Ron (Univ. of New Mexico)

09:00-09:15	WeAT8.7

Leader-Follower Formation Control of Nonholonomic Robots with Fuzzy Logic Based Approach for Obstacle Avoidance, pp. 2340-2345.

Ghommam, Jawhar (INSAT), Mehrjerdi, Hasan (Quebec Univ. (ETS)), Saad, Maarouf (École de Tech. supérieure)

09:15-09:30	WeAT8.8

On the Convergence of Braitenberg Vehicle 3a Immersed in Parabolic Stimuli, pp. 2346-2351.

Rañó, Iñaki (Ruhr-Univ.)

WeAT9	Continental Parlor 9
Vision: From Features to Applications (Regular Session)	
Chair: Kosecka, Jana	George Mason Univ.
Co-Chair: Mahoor, Mohammad	Univ. of Denver

08:00-08:15	WeAT9.1

Yield Estimation in Vineyards by Visual Grape Detection, pp. 2352-2358. Attachment

Nuske, Stephen (CMU Robotics Inst.), Achar, Supreeth (Carnegie Mellon Univ.), Bates, Terry (Cornell Univ.), Narasimhan, Srinivasa (Carnegie Mellon Univ.), Singh, Sanjiv (Carnegie Mellon Univ.)

08:15-08:30	WeAT9.2

Robust Feature Matching for Robot Visual Learning, pp. 2359-2364.

Gao, Ce (Department of Computer Science &Tech. B), Song, Yixu (Department of Computer Science & Tech. TsinghuaUniversity,), Jia, Peifa (Department of Computer Science & Tech. TsinghuaUniversity,)

08:30-08:45	WeAT9.3

A Rotation Invariant Feature Descriptor O-DAISY and Its FPGA Implementation, pp. 2365-2370.

Fischer, Jan (Fraunhofer IPA), Ruppel, Alexander (Fraunhofer IPA), Weisshardt, Florian (Fraunhofer IPA), Verl, Alexander (Fraunhofer-Gesellschaft)

08:45-08:50	WeAT9.4

Adaptive Multi-Affine (AMA) Feature-Matching Algorithm and Its Application to Minimally-Invasive Surgery Images, pp. 2371-2376. Attachment

Puerto, Gustavo Armando (Univ. of Texas at Arlington), Adibi, Mehrad (Univ. of Texas Southwestern Medical Center), Cadeddu, Jeffrey A. (Univ. of Texas Southwestern Medical Center), Mariottini, Gian Luca (Univ. of Texas at Arlington)

08:50-08:55	WeAT9.5

Video Stabilization Using SIFT-ME Features and Fuzzy Clustering, pp. 2377-2382.

Veon, Kevin (Univ. of Denver), Mahoor, Mohammad (Univ. of Denver), Voyles, Richard (Univ. of Denver)

08:55-09:00	WeAT9.6

Label Propagation in Videos Indoors with an Incremental Non-Parametric Model Update, pp. 2383-2389.

Rituerto, Jorge (Univ. of Zaragoza), Murillo, Ana Cristina (Univ. of Zaragoza), Kosecka, Jana (George Mason Univ.)

09:00-09:15	WeAT9.7

A Learning Algorithm for Visual Pose Estimation of Continuum Robots, pp. 2390-2396.

Reiter, Austin (Columbia Univ.), Goldman, Roger E. (Columbia Univ.), Bajo, Andrea (Vanderbilt Univ.), Iliopoulos, Konstantinos (Columbia Univ.), Simaan, Nabil (Vanderbilt Univ.), Allen, Peter (Columbia Univ.)

09:15-09:30	WeAT9.8

Multilayer Real-Time Video Stabilization, pp. 2397-2402. Attachment

Windau, Jens (Univ. of Southern California), Itti, Laurent (Univ. of Southern California)

WeAPT10	Golden Gate Room
Interactive V (Interactive Session)	

08:00-09:30	WeAPT10.1

*Real-Time Swept Volume and Distance Computation for Self Collision Detection**.

Täubig, Holger (German Res. Center for Artificial Intelligence), Bäuml, Berthold (German Aerospace Centre), Frese, Udo (Univ. Bremen)

08:00-09:30	WeAPT10.2

*Visual Navigation with Obstacle Avoidance**.

Cherubini, Andrea (INRIA Rennes - Bretagne Atlantique), Chaumette, Francois (INRIA Rennes-Bretagne Atlantique)

08:00-09:30	WeAPT10.3

*Stereo Obstacle Detection in Challenging Environments: The VIAC Experience**.

Broggi, Alberto (Univ. of Parma), Buzzoni, Michele (VisLab - Dipartimento di Ingegneria Dell'Informazione), Felisa, Mirko (Univ. of Parma, Italy), Zani, Paolo (Univ. of Parma, Italy)

08:00-09:30	WeAPT10.4

*A Strategy for Efficient Observation Pruning in Multi-Objective 3D SLAM**.

Valls Miro, Jaime (Univ. of Tech. Sydney), Zhou, Weizhen (Univ. of Tech. Sydney), Dissanayake, Gamini (Univ. of Tech. Sydney)

08:00-09:30	WeAPT10.5

*Combined Visually and Geometrically Informative Link Hypothesis for Pose-Graph Visual SLAM Using Bag-Of-Words**.

Kim, Ayoung (Univ. of Michigan), Eustice, Ryan (Univ. of Michigan)

08:00-09:30	WeAPT10.6

*RS-SLAM: RANSAC Sampling for Visual FastSLAM**.

Lee, Gim Hee (ETH Zurich), Fraundorfer, Friedrich (ETH Zurich), Pollefeys, Marc (ETH Zurich)

08:00-09:30	WeAPT10.7

First Leaps Toward Jumping Microrobots (I)*.

Bergbreiter, Sarah (Univ. of Maryland, Coll. Park), Gerratt, Aaron P. (Univ. of Maryland, Coll. Park), Churaman, Wayne (U.S. Army Res. Lab.)

08:00-09:30	WeAPT10.8

Micro-Scale Propulsion Using Multiple Flexible Artificial Flagella (I)*.

Singleton, John (Carnegie Mellon Univ.), Diller, Eric D. (Carnegie Mellon Univ.), Régnier, Stéphane (Univ. Pierre et Marie Curie), Sitti, Metin (Carnegie Mellon Univ.)

08:00-09:30	WeAPT10.9

Smart Manipulation of Multiple Bacteria-Driven Microobjects Based on Bacterial Autonomous Movement*.

Nogawa, Kousuke (Nagoya Univ.), Kojima, Masaru (Nagoya Univ.), Nakajima, Masahiro (Nagoya Univ.), Homma, Michio (Nagoya Univ.), Fukuda, Toshio (Nagoya Univ.)

08:00-09:30	WeAPT10.10

Dual Predictive Control of Electrically Stimulated Muscle Using Biofeedback for Drop Foot Correction*.

Zhang, Qin (INRIA/UM2), Hayashibe, Mitsuhiro (INRIA), Azevedo Coste, Christine (LIRMM)

08:00-09:30	WeAPT10.11

Gait Support for Complete Spinal Cord Injury Patient by Synchronized Leg-Swing with HAL*.

Tsukahara, Atsushi (Univ. of Tsukuba), Hasegawa, Yasuhisa (Univ. of Tsukuba), Sankai, Yoshiyuki (Univ. of Tsukuba)

08:00-09:30	WeAPT10.12

A Subject-Based Motion Generation Model with Adjustable Walking Pattern for a Gait Robotic Trainer: NaTUre-Gaits*.

Wang, Ping (Nanyang Tech. Univ.), Low, K. H. (Nanyang Tech. Univ.)

08:00-09:30	WeAPT10.13

Experimental Evaluation of Postural Synergies During Reach to Grasp with the UB Hand IV*.

Ficuciello, Fanny (Univ. di Napoli Federico II), Palli, Gianluca (Univ. of Bologna), Melchiorri, Claudio (Univ. of Bologna), Siciliano, Bruno (Univ. Napoli Federico II)

08:00-09:30	WeAPT10.14

Planning Grasps for Robotic Hands Using a Novel Object Representation Based on the Medial Axis Transform*.

Przybylski, Markus (Karlsruhe Inst. of Tech. (KIT)), Asfour, Tamim (Karlsruhe Inst. of Tech. (KIT)), Dillmann, Rüdiger (KIT Karlsruher Inst. für Tech.)

08:00-09:30	WeAPT10.15

Exploiting Potential Energy Storage for Cyclic Manipulation: An Analysis for Elastic Dribbling with an Anthropomorphic Robot*.

Haddadin, Sami (German Aerospace Center (DLR)), Krieger, Kai (German Aerospace Center), Kunze, Mirko (German Aerospace Center), Albu-Schäffer, Alin (DLR - German Aerospace Center)

08:00-09:30	WeAPT10.16

Variable Radius Pulley Design Methodology for Pneumatic Artificial Muscle-Based Antagonistic Actuation Systems*.

Shin, Dongjun (Stanford Univ.), Yeh, Xiyang (Stanford Univ.), Khatib, Oussama (Stanford Univ.)

08:00-09:30	WeAPT10.17

Wrist and Forearm Rotation of the DLR Hand Arm System: Mechanical Design, Shape Analysis and Experimental Validation*.

Friedl, Werner (German AerospaceCenter (DLR)), Hoeppner, Hannes (DLR - German Aerospace Center), Petit, Florian (German Aerospace Center (DLR)), Hirzinger, Gerd (German Aerospace Center (DLR))

08:00-09:30	WeAPT10.18

High-Backdrivable Parallel-Link Manipulator with Continuously Variable Transmission*.

Tahara, Kenji (Kyushu Univ.), Iwasa, Shingo (Kyushu Univ.), Naba, Shu (Kyushu Univ.), Yamamoto, Motoji (Kyushu Univ.)

08:00-09:30	WeAPT10.19

A Snake-Like Robot Driven by a Decentralized Control That Enables Both Phasic and Tonic Control*.

Sato, Takahide (Tohoku Univ.), Kano, Takeshi (Tohoku Univ.), Ishiguro, Akio (Tohoku Univ.)

08:00-09:30	WeAPT10.20

Lizard-Inspired Active Tails Enable Rapid Maneuvers and Dynamic Stabilization in a Terrestrial Robot*.

Chang-Siu, Evan (Univ. of California, Berkeley), Libby, Tom (Univ. of California, Berkeley), Tomizuka, Masayoshi (Univ. of California), Full, Robert (Univ. of California at Berkeley)

08:00-09:30	WeAPT10.21

Moving Right Arm in the Right Place: Ophiuroid-Inspired Omnidirectional Robot Driven by Coupled Dynamical Systems*.

Watanabe, Wataru (Tohoku Univ.), Suzuki, Shota (Tohoku Univ.), Kano, Takeshi (Tohoku Univ.), Ishiguro, Akio (Tohoku Univ.)

08:00-09:30	WeAPT10.22

DLR VR-SCAN: A Versatile and Robust Miniaturized Laser Scanner for Short Range 3D-Modelling and Exploration in Robotics*.

Kielhöfer, Simon (German Aerospace Center (DLR)), Bahls, Thomas (German Aerospace Center), Hacker, Franz (Deutsches Zentrum für Luft- und Raumfahrt e.V. (DLR)), Wüsthoff, Tilo (DLR), Suppa, Michael (German Aerospace Center (DLR))

08:00-09:30	WeAPT10.23

Piezoelectric Self-Sensing Technique for Tweezer Style End-Effector*.

McPherson, Timothy (Georgia Inst. of Tech.), Ueda, Jun (Georgia Inst. of Tech.)

08:00-09:30	WeAPT10.24

Development of a Fabric Sensor Using Tension-Sensitive Electro-Conductive Yarns in Recognition of Slippage*.

Ho, Van (Ritsumeikan Univ.), Kondo, Daisuke (Graduate School of Science and Engineering), Okada, Shima (Graduate School of Science and Engineering, Ritsumeikan Univ.), Araki, Takahiro (Res. and Development Div. Okamoto Corp.), Fujita, Emi (Res. and Development Div. Okamoto Corp.), Makikawa, Masaaki (Coll. of Science and Engineering, Ritsumeikan Univ.), Hirai, Shinichi (Ritsumeikan Univ.)

WeBT1	Continental Parlor 1
Socially Assistive Robots (Regular Session)	
Chair: Nunes, Urbano	Univ. de Coimbra
Co-Chair: Wade, Eric	Univ. of Southern California

10:00-10:15	WeBT1.1

Using Socially Assistive Robotics to Augment Motor Task Performance in Individuals Post–Stroke, pp. 2403-2408.

Wade, Eric (Univ. of Southern California), Parnandi, Avinash (Texas A&M, USC), Mataric, Maja (Univ. of Southern California)

10:15-10:30	WeBT1.2

The Impact of Different Competence Levels of Care-Receiving Robot on Children, pp. 2409-2415.

Ghosh, Madhumita (Univ. of Tsukuba), Tanaka, Fumihide (Univ. of Tsukuba)

10:30-10:45	WeBT1.3

An Experience-Driven Robotic Assistant Acquiring Human Knowledge to Improve Haptic Cooperation, pp. 2416-2422. Attachment

    Medina Hernandez, Jose Ramon (Tech. Univ. München), Lawitzky, Martin (Tech. Univ. Muenchen), Mörtl, Alexander (Tech. Univ. München), Lee, Dongheui (Tech. Univ. of Munich), Hirche, Sandra (Tech. Univ. München)

10:45-10:50	WeBT1.4

Study on a Practical Robotic Follower to Support Home Oxygen Therapy Patients -Development and Control of a Mobile Platform, pp. 2423-2429. Attachment

    Tani, Atsushi (Tokyo Inst. of Tech.), Endo, Gen (Tokyo Inst. of Tech.), Fukushima, Edwaldo F. (Tokyo Inst. of Tech.), Hirose, Shigeo (Tokyo Inst. of Tech.), Iribe, Masatsugu (Osaka Electro-Communication Univ.), Takubo, Toshio (Tokyo Women's Medical Univ.)

10:50-10:55	WeBT1.5

Progress in Developing a Socially Assistive Mobile Home Robot Companion for the Elderly with Mild Cognitive Impairment, pp. 2430-2437.

    Gross, Horst-Michael (Ilmenau Univ. of Tech.), Schroeter, Christof (Ilmenau Univ. of Tech.), Mueller, Steffen (Ilmenau Univ. of Tech.), Volkhardt, Michael (Ilmenau, Univ. of Tech.), Einhorn, Erik (Ilmenau Univ. of Tech.), Bley, Andreas (MetraLabs GmbH), Martin, Christian (MetraLabs GmbH), Merten, Matthias (MetraLabs GmbH), Langner, Tim (MetraLabs GmbH)

10:55-11:00	WeBT1.6

Wheelchair Navigation Assisted by Human-Machine Shared-Control and a P300-Based Brain Computer Interface, pp. 2438-2444.

    Lopes, Ana (Univ. of Coimbra), Pires, Gabriel (Univ. of Coimbra), Vaz, Luís (Univ. of Coimbra), Nunes, Urbano (Univ. de Coimbra)

11:00-11:15	WeBT1.7

Whole-Body Contact Manipulation Using Tactile Information for the Nursing-Care Assistant Robot RIBA, pp. 2445-2451.

    Mukai, Toshiharu (RIKEN), Hirano, Shinya (RIKEN RTC), Yoshida, Morio (RIKEN), Nakashima, Hiromichi (RIKEN), Guo, Shijie (Tokai Rubber Industries, Ltd.), Hayakawa, Yoshikazu (Nagoya Univ.)

11:15-11:30	WeBT1.8

Should Robots or People Do These Jobs? a Survey of Robotics Experts and Non-Experts about Which Jobs Robots Should Do, pp. 2452-2459.

    Ju, Wendy (Willow Garage), Takayama, Leila (Willow Garage)

WeBT2	Continental Parlor 2
Estimation & Sensor Fusion (Regular Session)	

Chair: Peynot, Thierry	The Univ. of Sydney
Co-Chair: Martinelli, Agostino	INRIA Grenoble-Rhone-Alpes

10:00-10:15	WeBT2.1

Vision-Aided Inertial Navigation: Closed-Form Determination of Absolute Scale, Speed and Attitude, pp. 2460-2465.

    Martinelli, Agostino (INRIA Grenoble-Rhone-Alpes), Troiani, Chiara (INRIA Rhone Alpes), Renzaglia, Alessandro (INRIA)

10:15-10:30	WeBT2.2

Attitude Determination Framework by Globally and Asymptotically Stable Bias Error Estimation with Disturbance Attenuation and Rejection, pp. 2466-2473.

    Yamato, Hideaki (Chiba Inst. of Tech.), Furuta, Takayuki (Chiba Inst. of Tech.), Tomiyama, Ken (Chiba Inst. of Tech.)

10:30-10:45	WeBT2.3

Time-Varying Complementary Filtering for Attitude Estimation, pp. 2474-2480.

    Chang-Siu, Evan (Univ. of California, Berkeley), Tomizuka,

Masayoshi (Univ. of California), Kong, Kyoungchul (Sogang Univ.)

10:45-10:50	WeBT2.4

A Sensor Fusion Approach to Angle and Angular Rate Estimation, pp. 2481-2488.

    Kubus, Daniel (Tech. Univ. Braunschweig), Wahl, Friedrich M. (Tech. Univ. of Braunschweig)

10:50-10:55	WeBT2.5

Combining Multiple Sensor Modalities for a Localisation Robust to Smoke, pp. 2489-2496. Attachment

    Brunner, Christopher Joseph (The Univ. of Sydney), Peynot, Thierry (The Univ. of Sydney), Vidal-Calleja, Teresa A. (Univ. of Sydney)

10:55-11:00	WeBT2.6

Multisensor Data Fusion for Robust Pose Estimation of a Six-Legged Walking Robot, pp. 2497-2504.

    Chilian, Annett (DLR German Aerospace Center), Hirschmüller, Heiko (German Aerospace Center (DLR)), Goerner, Martin (German Aerospace Center (DLR))

11:00-11:15	WeBT2.7

An Improved Pedestrian Inertial Navigation System for Indoor Environments, pp. 2505-2510.

    Lamy-Perbal, Sylvie (CEA), Boukallel, Mehdi (CEA)

11:15-11:30	WeBT2.8

Learning the Delaunay Triangulation of Landmarks from a Distance Ordering Sensor, pp. 2511-2516.

    Katsev, Max (Univ. of Illinois), LaValle, Steven M (Univ. of Illinois)

WeBT3	Continental Parlor 3
Surgical Robotics (Regular Session)	

Chair: Chung, Wan Kyun	POSTECH
Co-Chair: Misra, Sarthak	Univ. of Twente

10:00-10:15	WeBT3.1

A Bimanual Teleoperated System for Endonasal Skull Base Surgery, pp. 2517-2523.

    Burgner, Jessica (Vanderbilt Univ.), Swaney, Philip (Vanderbilt Univ.), Rucker, Caleb (Vanderbilt Univ.), Gilbert, Hunter B. (Rice Univ.), Nill, Scott T. (Vanderbilt Univ.), Russell, Paul T. (Vanderbilt Univ. Medical Center), Weaver, Kyle D. (Vanderbilt Univ. Medical Center), Webster III, Robert James (Vanderbilt Univ.)

10:15-10:30	WeBT3.2

Automated Surgical Planning and Evaluation Algorithm for Spinal Fusion Surgery with Three-Dimensional Pedicle Model, pp. 2524-2531.

    Lee, Jongwon (POSTECH), Kim, Sungmin (Hanyang Univ.), Kim, Young Soo (School of Medicine, Hanyang Univ.), Chung, Wan Kyun (POSTECH), Kim, Minjun (POSTECH)

10:30-10:45	WeBT3.3

Evaluation of Command Modes of an Assistance Robot for Middle Ear Surgery, pp. 2532-2538.

    Kazmitcheff, Guillaume (UMR-S 867 Inserm / Univ. Paris 7 Denis Diderot), Miroir, Mathieu (UMR-S 867 Inserm / Univ. Paris 7 Denis Diderot), Nguyen, Yann (Unit-M 867 Inserm / Paris 7 Denis-Diderot), Célérier, Charlotte (UMR-S 867 Inserm / Univ. Paris 7 Denis Diderot), Mazalaigue, Stéphane (Company Coll. inc), Ferrary, Evelyne (UMR-S 867 Inserm / Univ. Paris 7 Denis Diderot / AP-HP, hôp), Sterkers, Olivier (UFR de Médecine Paris 7 Denis Diderot Faculté Xavier Bichat), Bozorg Grayeli, Alexis (UMR-S 867 Inserm / Univ. Paris 7 Denis Diderot / AP-HP, hôp)

10:45-10:50	WeBT3.4

Towards Validation of Robotic Surgery Training Assessment across

Training Platforms, pp. 2539-2544.

> Gao, Yixin (Johns Hopkins Univ.), Sedef, Mert (Koc Univ.), Jog, Amod (Johns Hopkins Univ.), Peng, Peter (Johns Hopkins Univ.), Choti, Michael (Johns Hopkins Univ.), Hager, Gregory (Johns Hopkins Univ.), Berkley, Jeff (MIMIC Tech. Inc), Kumar, Rajesh (Johns Hopkins Univ.)

10:50-10:55	WeBT3.5

Adaptive Path Planning for Steerable Needles Using Duty-Cycling, pp. 2545-2550. Attachment

> Bernardes, Mariana Costa (Univ. of Montpellier 2 / CNRS - LIRMM), Adorno, Bruno Vilhena (Univ. of Montpellier 2 / CNRS - LIRMM), Poignet, Philippe (LIRMM UMR 5506 CNRS UM2), Zemiti, Nabil (Univ. Montpellier II - CNRS UMR 5506), Borges, Geovany Araujo (Univ. de Brasilia)

10:55-11:00	WeBT3.6

An Analytical Model for Deflection of Flexible Needles During Needle Insertion, pp. 2551-2556.

> Asadian, Ali (The Univ. of Western Ontario (UWO)), Kermani, Mehrdad R. (Univ. of Western Ontario), Patel, Rajnikant V. (The Univ. of Western Ontario)

11:00-11:15	WeBT3.7

Mechanics of Needle-Tissue Interaction, pp. 2557-2563.

> Roesthuis, Roy (Univ. of Twente), van Veen, Youri (Univ. of Twente), Jahya, Alex (Univ. of Twente, The Netherlands), Misra, Sarthak (Univ. of Twente)

11:15-11:30	WeBT3.8

Feasibility Study of an Optically Actuated MR-Compatible Active Needle, pp. 2564-2569.

> Ryu, Seok Chang (Stanford Univ.), Renaud, Pierre (LSIIT, Strasbourg Univ.), Black, Richard J. (Intelligent Fiber Optic Systems Corp.), Daniel, Bruce (Stanford Univ. Department of Radiology), Cutkosky, Mark (Stanford Univ.)

WeBT4	Continental Ballroom 4

Symposium: Hardware and Software Design for Haptic Systems (Invited Session)

Chair: Yokokohji, Yasuyoshi	Kobe Univ.
Co-Chair: Kuchenbecker, Katherine J.	Univ. of Pennsylvania
Organizer: O'Malley, Marcia	Rice Univ.
Organizer: Kuchenbecker, Katherine J.	Univ. of Pennsylvania
Organizer: Yokokohji, Yasuyoshi	Kobe Univ.

10:00-10:15	WeBT4.1

A Friction Differential and Cable Transmission Design for a 3-DOF Haptic Device with Spherical Kinematics, pp. 2570-2577.

> Brewer, Reuben (Stanford Univ.), Leeper, Adam Eric (Stanford Univ.), Salisbury, Kenneth (Stanford Univ.)

10:15-10:30	WeBT4.2

Hi5: A Versatile Dual-Wrist Device to Study Human-Human Interaction and Bimanual Control, pp. 2578-2583.

> Melendez-Calderon, Alejandro (Imperial Coll. London), Bagutti, Lorenzo (Imperial Coll. London), Pedrono, Brice (Imperial Coll. London), Burdet, Etienne (imperial Coll. london)

10:30-10:45	WeBT4.3

Coaxial Needle Insertion Assistant for Epidural Puncture, pp. 2584-2589.

> Koseki, Yoshihiko (AIST), De Lorenzo, Danilo (Pol. di Milano), Chinzei, Kiyoyuki (National Inst. of Advanced Industrial Science andTechnology), Okamura, Allison M. (Johns Hopkins Univ.)

10:45-10:50	WeBT4.4

Two Hands Are Better Than One: Assisting Users with Multi-Robot Manipulation Tasks, pp. 2590-2595. Attachment

> Lewis, Bennie (Univ. of Central Florida), Sukthankar, Gita (Univ. of Central Florida)

10:50-10:55	WeBT4.5

3-DOF Haptic Feedback for Assisted Driving of an Omnidirectional Wheelchair, pp. 2596-2601.

> Christensen, Quinton (Univ. of Utah), Mascaro, Stephen (Univ. of Utah)

10:55-11:00	WeBT4.6

Configuration-Based Optimization for Six Degree-Of-Freedom Haptic Rendering Using Sphere-Trees, pp. 2602-2607. Attachment

> Zhang, Xin (Beihang Univ.), Wang, Dangxiao (Beihang Univ.), Zhang, Yuru (Beihang Univ.), Xiao, Jing (UNC-Charlotte)

11:00-11:15	WeBT4.7

Asynchronous Haptic Simulation of Contacting Deformable Objects with Variable Stiffness, pp. 2608-2613. Attachment

> Peterlik, Igor (INRIA Lille Nord Europe), Duriez, Christian (INRIA), Cotin, Stephane (INRIA)

11:15-11:30	WeBT4.8

Proxy Method for Fast Haptic Rendering from Time Varying Point Clouds, pp. 2614-2619.

> Rydén, Fredrik (Univ. of Washington), Nia Kosari, Sina (Univ. of Washington), Chizeck, Howard (Univ. of Washington)

WeBT5	Continental Ballroom 5

Symposium: Foundations and Future Prospects of Sampling-Based Motion Planning (Invited Session)

Chair: Bekris, Kostas E.	Univ. of Nevada, Reno
Co-Chair: LaValle, Steven M	Univ. of Illinois
Organizer: Bekris, Kostas E.	Univ. of Nevada, Reno
Organizer: LaValle, Steven M	Univ. of Illinois

10:00-10:15	WeBT5.1

Semi-Plenary Invited Talk: Sampling-Based Algorithms for General Motion Control Problems: Recent Advances and New Challenges*.

> Frazzoli, Emilio (Massachusetts Inst. of Tech.)

10:30-10:45	WeBT5.3

An Obstacle-Responsive Technique for the Management and Distribution of Local Rapidly-Exploring Random Trees (I), pp. 2620-2625.

> Wedge, Nathan (Case Western Res. Univ.), Branicky, Michael (Case Western Res. Univ.)

10:45-10:50	WeBT5.4

Finding Critical Changes in Dynamic Configuration Spaces (I), pp. 2626-2631.

> Lu, Yanyan (George Mason Univ.), Lien, Jyh-Ming (George Mason Univ.)

10:50-10:55	WeBT5.5

Toggle PRM: Simultaneous Mapping of C-Free and C-Obstacle - a Study in 2D - (I), pp. 2632-2639.

> Denny, Jory (Texas A&M Univ.), Amato, Nancy (Texas A&M Univ.)

10:55-11:00	WeBT5.6

Sampling Heuristics for Optimal Motion Planning in High Dimensions, pp. 2640-2645. Attachment

> Akgun, Baris (Georgia Inst. of Tech.), Stilman, Mike (Georgia Tech.)

11:00-11:15	WeBT5.7

EG-RRT: Environment-Guided Random Trees for Kinodynamic Motion Planning with Uncertainty and Obstacles (I), pp. 2646-2652.

Jaillet, Leonard (Inst. de Robòtica i Informàtica Industrial CSIC-UPC), Hoffman, Judy (Univ. of California, Berkeley), van den Berg, Jur (Univ. of North Carolina at Chapel Hill), Abbeel, Pieter (UC Berkeley), Porta, Josep M (CSIC-UPC), Goldberg, Ken (UC Berkeley)

11:15-11:30	WeBT5.8

Planning Humanlike Actions in Blending Spaces (I), pp. 2653-2659.
Attachment

Huang, Yazhou (Univ. of California Merced), Mahmudi, Mentar (Univ. of California Merced), Kallmann, Marcelo (Univ. of California, Merced)

WeBT6	Continental Ballroom 6

Symposium: Aerial Robotics: Control and Planning (Invited Session)

Chair: Saripalli, Srikanth	Arizona State Univ.
Co-Chair: Abbeel, Pieter	UC Berkeley
Organizer: Michael, Nathan	Univ. of Pennsylvania
Organizer: Abbeel, Pieter	UC Berkeley
Organizer: Saripalli, Srikanth	Arizona State Univ.

10:00-10:15	WeBT6.1

UAV Rotorcraft in Compliant Contact: Stability Analysis and Simulation, pp. 2660-2667.

Pounds, Paul (Yale Univ.), Dollar, Aaron (Yale Univ.)

10:15-10:30	WeBT6.2

Design, Modeling, Estimation and Control for Aerial Grasping and Manipulation (I), pp. 2668-2673. Attachment

Mellinger, Daniel (Univ. of Pennsylvania), Lindsey, Quentin (Univ. of Pennsylvania), Shomin, Michael (Univ. of Pennsylvania), Kumar, Vijay (Univ. of Pennsylvania)

10:30-10:45	WeBT6.3

Flight Control for Target Seeking by 13 Gram Ornithopter, pp. 2674-2681.

Baek, Stanley (UC Berkeley), Garcia Bermudez, Fernando (Univ. of California, Berkeley), Fearing, Ronald (Univ. of California at Berkeley)

10:45-10:50	WeBT6.4

Embedded Robust Nonlinear Control for a Four-Rotor Rotorcraft: Validation in Real-Time with Wind Disturbances, pp. 2682-2687.
Attachment

Muñoz Hernandez, Laura Elena (HEUDIASYC UMR UTC 6599), Castillo, Pedro (Univ. de Tech. de Compiègne), Sanahuja, Guillaume (Univ. de Tech. de Compiègne), Santos Sanchez, Omar Jacobo (Univ. Autonoma del Estado de Hidalgo, Mexico)

10:50-10:55	WeBT6.5

Differential Flatness Based Control of a Rotorcraft for Aggressive Maneuvers, pp. 2688-2693.

Ferrin, Jeffrey (Brigham Young Univ.), Leishman, Robert (Brigham Young Univ.), Beard, Randy (Brigham Young Univ.), McLain, T.W. (Bringham Young Univ.)

10:55-11:00	WeBT6.6

Robust Embedded Egomotion Estimation (I), pp. 2694-2699.

Voigt, Rainer (ETH Zurich), Nikolic, Janosch (ETH Zürich), Hürzeler, Christoph (ETH Zürich), Weiss, Stephan (ETH Zurich), Kneip, Laurent (ETHZ), Siegwart, Roland (ETH Zurich)

11:00-11:15	WeBT6.7

Magnetic Localization for Perching UAVs on Powerlines (I), pp. 2700-2707.

Moore, Joseph (Massachusetts Inst. of Tech.), Tedrake, Russ (Massachusetts Inst. of Tech.)

11:15-11:30	WeBT6.8

Persistent Surveillance with a Team of MAVs (I), pp. 2708-2714.

Michael, Nathan (Univ. of Pennsylvania), Stump, Ethan (Army Res. Lab.), Mohta, Kartik (Univ. of Pennsylvania)

WeBT7	Continental Parlor 7

Passive Walking & Leg-Wheeled Robots (Regular Session)

Chair: Kwon, Dong-Soo	KAIST
Co-Chair: Buehler, Martin	iRobot

10:00-10:15	WeBT7.1

Nonlinear Structure of Escape-Times to Fall of a Passive Dynamic Walker on an Irregular Slope: Anomaly Detection by Multi-Class Support Vector Machine and Latent State Extraction by Canonical Correlation Analysis, pp. 2715-2722.

Suetani, Hiromichi (Kagoshima Univ.), Ideta, Aiko (Kagoshima Univ.), Morimoto, Jun (ATR Computational Neuroscience Lab.)

10:15-10:30	WeBT7.2

Increasing the Robustness of Acrobot Walking Control Using Compliant Mechanisms, pp. 2723-2728.

Ahmad Sharbafi, Maziar (Univ. of Tehran), Yazdanpanah, M. J. (Univ. of Tehran), Nili Ahmadabadi, Majid (Univ. of Tehran)

10:30-10:45	WeBT7.3

Optimal Gait Switching for Legged Locomotion, pp. 2729-2734.

Kersbergen, Bart (Delft Univ. of Tech.), Lopes, Gabriel (Delft Univ. of Tech.), van den Boom, Ton (Delft Univ. of Tech.), De Schutter, Bart (Delft Univ. of Tech.), Babuska, Robert (Delft Univ. of Tech.)

10:45-10:50	WeBT7.4

Development and Experiment of a Kneed Biped Walking Robot Based on Parametric Excitation Principle, pp. 2735-2740. Attachment

Banno, Yoshihisa (Nagoya Univ.), Harata, Yuji (Hiroshima Univ.), Taji, Kouichi (Nagoya Unviersity), Uno, Yoji (Nagoya Univ.)

10:50-10:55	WeBT7.5

Switchblade: An Agile Treaded Rover, pp. 2741-2746. Attachment

Morozovsky, Nicholas (Univ. of California San Diego), Schmidt-Wetekam, Christopher (Univ. of California San Diego), Bewley, Thomas (Flow Control & Coordinated Robotics Lab.)

10:55-11:00	WeBT7.6

Passive Dynamic Walking of Combined Rimless Wheel and Its Speeding-Up by Adjustment of Phase Difference, pp. 2747-2752.
Attachment

Inoue, Ryosuke (Japan Advanced Inst. of Science and Tech.), Asano, Fumihiko (Japan Advanced Inst. of Science and Tech.), Tanaka, Daiki (Japan Advanced Inst. of Science and Tech.), Tokuda, Isao (Japan Advanced Inst. of Science and Tech.)

11:00-11:15	WeBT7.7

Robust Obstacle Crossing of a Wheel-Legged Mobile Robot Using Minimax Force Distribution and Self-Reconfiguration, pp. 2753-2758.

Jarrault, Pierre (Univ. Pierre et Marie Curie Paris 6), Grand, Christophe (Univ. Pierre et Marie Curie), Bidaud, Philippe (Univ. Pierre et Marie Curie - Paris 6)

11:15-11:30	WeBT7.8

Zero-Moment Point Feedforward Balance Control of Leg-Wheel Hybrid Structures by Using Input/Output Linearization, pp. 2759-2764.

An, Sang-ik (Korea Advanced Inst. of Science and Tech. (KAIST)), Kwon, Dong-Soo (KAIST)

Multirobot Systems: Rendezvous & Task Switching (Regular Session)

| Chair: Vaughan, Richard | Simon Fraser Univ. |
| Co-Chair: Arrichiello, Filippo | Univ. di Cassino |

| 10:00-10:15 | WeBT8.1 |

Bayesian Rendezvous for Distributed Robotic Systems, pp. 2765-2771.

    Gowal, Sven (EPFL), Martinoli, Alcherio (EPFL)

| 10:15-10:30 | WeBT8.2 |

Power-Aware Rendezvous with Shrinking Footprints, pp. 2772-2777.

    Jaleel, Hassan (Georgia Inst. of Tech.), Egerstedt, Magnus (Georgia Inst. of Tech.)

| 10:30-10:45 | WeBT8.3 |

A Decentralized Controller-Observer Scheme for Multi-Robot Weighted Centroid Tracking, pp. 2778-2783.

    Antonelli, Gianluca (Univ. degli Studi di Cassino), Arrichiello, Filippo (Univ. di Cassino), Caccavale, Fabrizio (Univ. degli Studi della Basilicata), Marino, Alessandro (Univ. degli Studi della Basilicata)

| 10:45-10:50 | WeBT8.4 |

Market-Based Coordination of Coupled Robot Systems, pp. 2784-2789.

    Xu, Ling (Carnegie Mellon Univ.), Stentz, Anthony (Carnegie Mellon Univ.)

| 10:50-10:55 | WeBT8.5 |

Event-Driven Gaussian Process for Object Localization in Wireless Sensor Networks, pp. 2790-2795. Attachment

    Yoo, Jae Hyun (Seoul National Univ.), Kim, Woojin (School of Mechanical and Aerospace Engineering, Seoul National U), Kim, H. Jin (Seoul National Univ.)

| 10:55-11:00 | WeBT8.6 |

Multi-Robot Patrolling with Coordinated Behaviours in Realistic Environments, pp. 2796-2801.

    Iocchi, Luca (Sapienza Univ. of Roma), Marchetti, Luca (Sophia Antipolis - Méditerranée), Nardi, Daniele (Sapienza Univ. of Rome)

| 11:00-11:15 | WeBT8.7 |

Task Switching in Multirobot Learning through Indirect Encoding, pp. 2802-2809. Attachment

    D'Ambrosio, David (Univ. of Central Florida), Lehman, Joel (Univ. of Central Florida), Risi, Sebastian (Univ. of Central Florida (UCF)), Stanley, Kenneth (Univ. of Central Florida)

| 11:15-11:30 | WeBT8.8 |

Multi-Robot Coordination Methodology in Congested Systems with Bottlenecks, pp. 2810-2816.

    Hoshino, Satoshi (Tokyo Inst. of Tech.)

WeBT9   Continental Parlor 9

Visual Servoing (Regular Session)

| Chair: Chaumette, Francois | INRIA Rennes-Bretagne Atlantique |
| Co-Chair: Hutchinson, Seth | Univ. of Illinois |

| 10:00-10:15 | WeBT9.1 |

From Optimal Planning to Visual Servoing with Limited FOV, pp. 2817-2824.

    Salaris, Paolo (Univ. of Pisa), Pallottino, Lucia (Univ. di Pisa), Hutchinson, Seth (Univ. of Illinois), Bicchi, Antonio (Univ. of Pisa)

| 10:15-10:30 | WeBT9.2 |

Constrained Manipulator Visual Servoing (CMVS): Rapid Robot Programming in Cluttered Workspaces, pp. 2825-2830.

    Chan, Ambrose (Univ. of British Columbia), Croft, Elizabeth (Univ. of British Columbia), Little, James J. (UBC)

| 10:30-10:45 | WeBT9.3 |

Intensity-Based Visual Servoing for Non-Rigid Motion Compensation of Soft Tissue Structures Due to Physiological Motion Using 4D Ultrasound, pp. 2831-2836. Attachment

    Lee, Deukhee (KIST), Krupa, Alexandre (INRIA Rennes - Bretagne Atlantique)

| 10:45-10:50 | WeBT9.4 |

Improving Ultrasound Intensity-Based Visual Servoing: Tracking and Positioning Tasks with 2D and Bi-Plane Probes, pp. 2837-2842. Attachment

    Nadeau, Caroline (IRISA, INRIA Rennes-Bretagne Atlantique), Krupa, Alexandre (INRIA Rennes - Bretagne Atlantique)

| 10:50-10:55 | WeBT9.5 |

Automatic Landing on Aircraft Carrier by Visual Servoing, pp. 2843-2848. Attachment

    Coutard, Laurent (INRIA Rennes - Bretagne Atlantique), Chaumette, Francois (INRIA Rennes-Bretagne Atlantique), Pflimlin, Jean-Michel (laas-cnrs)

| 10:55-11:00 | WeBT9.6 |

Combining IBVS and PBVS to Ensure the Visibility Constraint, pp. 2849-2854. Attachment

    Kermorgant, Olivier (INRIA Rennes-Bretagne Atlantique), Chaumette, Francois (INRIA Rennes-Bretagne Atlantique)

| 11:00-11:15 | WeBT9.7 |

Towards Vision-Based Control of Cable-Driven Parallel Robots, pp. 2855-2860.

    Dallej, Tej (LASMEA), Gouttefarde, Marc (LIRMM), Andreff, Nicolas (Univ. de Franche Comté), Michelin, Micaël (Fatronik Foundation), Martinet, Philippe (Blaise Pascal Univ.)

| 11:15-11:30 | WeBT9.8 |

Time-Analysis of a Real-Time Sensor-Servoing System Using Line-Of-Sight Path Tracking, pp. 2861-2866.

    Schrimpf, Johannes (NTNU), Lind, Morten (The Norwegian Univ. of Science and Tech.), Mathisen, Geir (SINTEF ICT)

WeBPT10   Golden Gate Room

Interactive VI (Interactive Session)

| 10:00-11:30 | WeBPT10.1 |

Human Preferences for Robot-Human Hand-Over Configurations*.

    Cakmak, Maya (Georgia Inst. of Tech.), Srinivasa, Siddhartha (Carnegie Mellon Univ.), Lee, Min Kyung (Carnegie Mellon Univ.), Forlizzi, Jodi (Carnegie Mellon Univ.), Kiesler, Sara (Carnegie Mellon Univ.)

| 10:00-11:30 | WeBPT10.2 |

Did You See It Hesitate? – Empirically Grounded Design of Hesitation Trajectories for Collaborative Robots*.

    Moon, AJung (Univ. of British Columbia), Parker, Chris (Univ. of British Columbia), Croft, Elizabeth (Univ. of British Columbia), Van der Loos, H.F. Machiel (Univ. of British Columbia (UBC))

| 10:00-11:30 | WeBPT10.3 |

VocaWather: Natural Singing Motion Generator for a Humanoid Robot*.

    Kajita, Shuuji (National Inst. of AIST), Nakano, Tomoyasu (National Inst. of AIST), Goto, Masataka (National Inst. of

Advanced Industrial Science and Tech. (AIST)), Matsusaka, Yosuke (National Inst. of Advanced Industrial Science andTechnology (AIST)), Nakaoka, Shin'ichiro (AIST), Yokoi, Kazuhito (National Inst. of AIST)

10:00-11:30	WeBPT10.4

4-Dimensional Local Spatio-Temporal Features for Human Activity Recognition*.

Zhang, Hao (Univ. of Tennessee), Parker, Lynne (Univ. of Tennessee)

10:00-11:30	WeBPT10.5

Fitting Conics to Noisy Data Using Stochastic Linearization*.

Baum, Marcus (Karlsruhe Inst. of Tech. (KIT)), Hanebeck, Uwe D. (Karlsruhe Inst. of Tech. (KIT))

10:00-11:30	WeBPT10.6

Bootstrapping Sensorimotor Cascades: A Group-Theoretic Perspective*.

Censi, Andrea (California Inst. of Tech.), Murray, Richard (California Inst. of Tech.)

10:00-11:30	WeBPT10.7

Toward Development of 3D Surgical Mouse Paradigm*.

Sun, Xiaochuan (Simon Fraser Univ.), Payandeh, Shahram (Simon Fraser Univ.)

10:00-11:30	WeBPT10.8

3D Thread Tracking for Robotic Assistance in Tele-Surgery*.

Padoy, Nicolas (Johns Hopkins Univ.), Hager, Gregory (Johns Hopkins Univ.)

10:00-11:30	WeBPT10.9

Ultrasound Image Features of the Wrist Are Linearly Related to Finger Positions*.

Castellini, Claudio (DLR - German Aerospace Res. Center), Passig, Georg (German Aerospace Center)

10:00-11:30	WeBPT10.10

On-Line Bio-Impedance Identification of Fingertip Skin for Enhancement of Electrotactile Based Haptic Rendering*.

Gregory, John (Michigan State Univ.), Shen, Yantao (Univ. of Nevada, Reno), Xi, Ning (Michigan State Univ.)

10:00-11:30	WeBPT10.11

Design of an MRI Compatible Haptic Interface*.

Turkseven, Melih (Georgia Inst. of Tech.), Ueda, Jun (Georgia Inst. of Tech.)

10:00-11:30	WeBPT10.12

Force Producibility Improvement of Redundant Parallel Mechanism for Haptic Applications*.

Arata, Jumpei (Nagoya Insititute of Tech.), Ikedo, Norio (Nagoya Inst. of Tech.), Fujimoto, Hideo (Nagoya Inst. of Tech.)

10:00-11:30	WeBPT10.13

Kinodynamic Motion Planning with State Lattice Motion Primitives (I)*.

Pivtoraiko, Mihail (Carnegie Mellon Univ.), Kelly, Alonzo (Carnegie Mellon Univ.)

10:00-11:30	WeBPT10.14

Efficient Motion Planning for Manipulation Robots in Environments with Deformable Objects (I)*.

Frank, Barbara (Univ. of Freiburg), Stachniss, Cyrill (Univ. of Freiburg), Abdo, Nichola (Univ. of Freiburg), Burgard, Wolfram (Univ. of Freiburg)

10:00-11:30	WeBPT10.15

Learning Dimensional Descent Planning for a Highly-Articulated Robot Arm (I)*.

Vernaza, Paul (Univ. of Pennsylvania), Lee, Daniel D. (Univ. of Pennsylvania)

10:00-11:30	WeBPT10.16

Bilateral Teleoperation of Multiple UAVs with Decentralized Bearing-Only Formation Control (I)*.

Franchi, Antonio (Max Planck Inst. for Biological Cybernetics), Masone, Carlo (Max Planck Inst. for Biological Cybernetics), Buelthoff, Heinrich H. (Max Planck Inst. for Biol. Cybernetics), Robuffo Giordano, Paolo (Max Planck Inst. for Biological Cybernetics)

10:00-11:30	WeBPT10.17

Modeling and Decoupling Control of the CoaX Micro Helicopter (I)*.

Fankhauser, Peter (ETH Zurich), Bouabdallah, Samir (Swiss Federal Inst. of Tech.), Leutenegger, Stefan (Swiss Federal Inst. of Tech. Zurich), Siegwart, Roland (ETH Zurich)

10:00-11:30	WeBPT10.18

On Active Target Tracking and Cooperative Localization for Multiple Aerial Vehicles (I)*.

Morbidi, Fabio (Univ. of Texas at Arlington), Mariottini, Gian Luca (Univ. of Texas at Arlington)

10:00-11:30	WeBPT10.19

Perturbation Theory to Plan Dynamic Locomotion in Very Rough Terrains*.

Sentis, Luis (The Univ. of Texas at Austin), Fernandez, Benito R. (The Univ. of Texas at Austin)

10:00-11:30	WeBPT10.20

Generation of Adaptive Splitbelt Treadmill Walking by a Biped Robot Using Nonlinear Oscillators with Phase Resetting*.

Aoi, Shinya (Kyoto Univ.), Yamashita, Tsuyoshi (Kyoto Univ.), Fujiki, Soichiro (Kyoto Univ.), Kohda, Takehisa (Kyoto Univ.), Senda, Kei (Kyoto Univ.), Tsuchiya, Kazuo (Kyoto Univ.)

10:00-11:30	WeBPT10.21

Experimental Verification of Hysteresis in Gait Transition of a Quadruped Robot Driven by Nonlinear Oscillators with Phase Resetting*.

Aoi, Shinya (Kyoto Univ.), Yamashita, Tsuyoshi (Kyoto Univ.), Fujiki, Soichiro (Kyoto Univ.), Katayama, Daiki (Kyoto Univ.), Kohda, Takehisa (Kyoto Univ.), Senda, Kei (Kyoto Univ.), Tsuchiya, Kazuo (Kyoto Univ.)

10:00-11:30	WeBPT10.22

Distributed Control of Multi-Robot Systems with Global Connectivity Maintenance*.

Sabattini, Lorenzo (Univ. of Modena and Reggio Emilia), Chopra, Nikhil (Univ. of Maryland, Coll. Park), Secchi, Cristian (Univ. of Modena & Reggio Emilia)

10:00-11:30	WeBPT10.23

RSSI-Based Physical Layout Classification and Target Tethering in Mobile Ad-Hoc Networks*.

Reddy, Prashant (Carnegie Mellon Univ.), Veloso, Manuela (Carnegie Mellon Univ.)

10:00-11:30	WeBPT10.24

Heterogeneous Sensor Network for Prioritized Sensing*.

Cortez, Andres (Univ. of New Mexico), Fierro, Rafael (Univ. of New Mexico)

10:00-11:30	WeBPT10.25

Adaptive Multi-Affine (AMA) Feature-Matching Algorithm and Its Application to Minimally-Invasive Surgery Images*.

Puerto, Gustavo Armando (Univ. of Texas at Arlington), Adibi, Mehrad (Univ. of Texas Southwestern Medical Center), Cadeddu, Jeffrey A. (Univ. of Texas Southwestern Medical Center), Mariottini, Gian Luca (Univ. of Texas at Arlington)

10:00-11:30	WeBPT10.26

Video Stabilization Using SIFT-ME Features and Fuzzy Clustering*.

Veon, Kevin (Univ. of Denver), Voyles, Richard (Univ. of Denver), Mahoor, Mohammad (Univ. of Denver)

10:00-11:30	WeBPT10.27

Label Propagation in Videos Indoors with an Incremental Non-Parametric Model Update*.

Rituerto, Jorge (Univ. of Zaragoza), Murillo, Ana Cristina (Univ. of Zaragoza), Kosecka, Jana (George Mason Univ.)

WePL	Continental Ballroom
Plenary II: BioRobotics (Plenary Session)	
Chair: Bajcsy, Ruzena	Univ. of California, Berkeley

12:30-13:45	WePL.1

BioRobotics Plenary*.

Berthoz, Alain (CNRS - Coll. de France), Buelthoff, Heinrich H. (Max Planck Inst. for Biol. Cybernetics), Srinivasan, Mandyam (The Univ. of Queensland)

WeCT1	Continental Parlor 1
Human-Robot Interaction and Cooperation (Regular Session)	
Chair: Sheng, Weihua	Oklahoma State Univ.
Co-Chair: Alami, Rachid	CNRS

14:00-14:15	WeCT1.1

A Path Planning Method for Human Tracking Agents Using Variable-Term Prediction Based on Dynamic K-Nearest Neighbor Algorithm, pp. 2867-2872.

Takemura, Noriko (Osaka Univ.), Nakamura, Yutaka (Osaka Univ.), Ishiguro, Hiroshi (Osaka Univ.)

14:15-14:30	WeCT1.2

Using Human Motion Estimation for Human-Robot Cooperative Manipulation, pp. 2873-2878.

Thobbi, Anand (Oklahoma State Univ.), Gu, Ye (Oklahoma State Univ.), Sheng, Weihua (Oklahoma State Univ.)

14:30-14:45	WeCT1.3

Sound Source Localization for Mobile Robot Based on Time Difference Feature and Space Grid Matching, pp. 2879-2886.

Li, Xiaofei (the Key Lab. Scho), Liu, Hong (Peking Univ.), Yang, Xuesong (Peking Univ.)

14:45-14:50	WeCT1.4

Adapting Robot Team Behavior from Interaction with a Group of People, pp. 2887-2894. Attachment

Urcola, Pablo (Inst. de Investigación en Ingeniería de Aragón, Univ.), Montano, Luis (Univ. de Zaragoza)

14:50-14:55	WeCT1.5

Towards a Platform-Independent Cooperative Human-Robot Interaction System: II. Perception, Execution and Imitation of Goal Directed Actions, pp. 2895-2902. Attachment

Lallée, Stéphane (INSERM Stem Cell & Brain Res. Inst.), Pattacini, Ugo (Istituto Italiano di Tecnologia (IIT)), Boucher, Jean-David (INSERM Stem Cell & Brain Res. Inst.), Lemaignan, Séverin (CNRS - LAAS), Lenz, Alexander (Bristol Robotic Lab.), Melhuish, Chris (Bristol Robotic Lab.), Natale, Lorenzo (Istituto Italiano di Tecnologia (IIT)), Skachek, Sergey (Bristol Robotic Lab.), Hamann, Katharina (Max Planck Inst. for Evolutionary Anthropology), Steinwender, Jasmin (Max Planck Inst. for Evolutionary Anthropology), Sisbot, Emrah Akin (LAAS/CNRS), Metta, Giorgio (Istituto Italiano di Tecnologia (IIT)), Alami, Rachid (CNRS - LAAS), Warnier, Matthieu (CNRS - LAAS), Guitton, Julien (CNRS - LAAS),

Warneken, Felix (Harvard Univ.), Dominey, Peter Ford (INSERM Stem Cell & Brain Res. Inst.)

14:55-15:00	WeCT1.6

Listening for People: Exploiting the Spectral Structure of Speech to Robustly Perceive the Presence of People, pp. 2903-2909.

Hilsenbeck, Barbara (Karlsruhe Univ. of Applied Sciences), Kirchner, Nathan (Univ. of Tech.)

15:00-15:15	WeCT1.7

Improvement of Speaker Localization by Considering Multipath Interference of Sound Wave for Binaural Robot Audition, pp. 2910-2915. Attachment

Kim, Ui-Hyun (Kyoto Univ.), Mizumoto, Takeshi (Kyoto Univ.), Ogata, Tetsuya (Kyoto Univ.), Okuno, Hiroshi G. (Kyoto Univ.)

15:15-15:30	WeCT1.8

Robot Audition and Beat Identification in Noisy Environments, pp. 2916-2921.

Grunberg, David (Drexel Univ.), Lofaro, Daniel (Drexel Univ.), Oh, Paul Y. (Drexel Univ.), Kim, Youngmoo (Drexel Univ.)

WeCT2	Continental Parlor 2
Pose Estimation & Visual Tracking (Regular Session)	
Chair: Papadopoulos, Evangelos	National Tech. Univ. of Athens
Co-Chair: Meeussen, Wim	Willow Garage inc.

14:00-14:15	WeCT2.1

Determination of Rigid-Body Pose from Imprecise Point Position Measurements, pp. 2922-2927.

Tegopoulou, Anastasia (National Tech. Univ. of Athens), Papadopoulos, Evangelos (National Tech. Univ. of Athens)

14:15-14:30	WeCT2.2

Pose Estimation from a Single Image Using Tensor Decomposition and an Algebra of Circulants, pp. 2928-2934.

Hoover, Randy (South Dakota School of Mines and Tech.), Braman, Karen (South Dakota School of Mines and Tech. Department of Mathe), Hao, Ning (Tufts Univ. Department of Mathematics)

14:30-14:45	WeCT2.3

Simultaneous Localization and Capture with Velocity Information, pp. 2935-2940. Attachment

Yuan, Qilong (Nanyang Tech. Univ.), Chen, I-Ming (Nanyang Tech. Univ.)

14:45-14:50	WeCT2.4

Outlet Detection and Pose Estimation for Robot Continuous Operation, pp. 2941-2946.

Eruhimov, Victor (Itseez), Meeussen, Wim (Willow Garage inc.)

14:50-14:55	WeCT2.5

Robust Tracking of Human Hand Postures for Robot Teaching, pp. 2947-2952. Attachment

Maycock, Jonathan (Bielefeld Univ.), Steffen, Jan (Bielefeld Univ.), Haschke, Robert (Bielefeld Univ.), Ritter, Helge Joachim (Bielefeld Univ.)

14:55-15:00	WeCT2.6

Visual Tracking Using the Sum of Conditional Variance, pp. 2953-2958. Attachment

Richa, Rogerio (Johns Hopkins Univ.), Sznitman, Raphael (Johns Hopkins Univ.), Taylor, Russell H. (The Johns Hopkins Univ.), Hager, Gregory (Johns Hopkins Univ.)

15:00-15:15	WeCT2.7

Visual Tracking of Robots in Uncalibrated Environments, pp.

2959-2964.

Wang, Hesheng (Shanghai Jiao Tong Univ.), Chen, Weidong (Shanghai Jiao Tong Univ.), Wang, Zhongli (Beijing Jiaotong Univ.)

15:15-15:30	WeCT2.8

Hybrid Discriminative Visual Object Tracking with Confidence Fusion for Robotics Applications, pp. 2965-2970.

Luo, Ren (National Taiwan Univ.), Kao, Ching-Chung (National Taiwan Univ.), Wu, Yen-Chang (National Taiwan Univ.)

WeCT3	Continental Parlor 3
Robot Safety (Regular Session)	
Chair: Voyles, Richard	Univ. of Denver
Co-Chair: Sardellitti, Irene	Italian Inst. of Tech.

14:00-14:15	WeCT3.1

Towards Safe Human-Robot Interaction in Robotic Cells: An Approach Based on Visual Tracking and Intention Estimation, pp. 2971-2978. Attachment

Bascetta, Luca (Pol. di Milano), Ferretti, Gianni (Pol. di Milano), Rocco, Paolo (Pol. di Milano), Ardö, Håkan (Lund Univ.), Bruyninckx, Herman (Katholieke Univ. Leuven), Demeester, Eric (Katholieke Univ. Leuven), Di Lello, Enrico (K.U. Leuven)

14:15-14:30	WeCT3.2

Guaranteed Safe Online Learning of a Bounded System, pp. 2979-2984.

Gillula, Jeremy (Stanford Univ.), Tomlin, Claire (UC Berkeley)

14:30-14:45	WeCT3.3

Relaxing the Inevitable Collision State Concept to Address Provably Safe Mobile Robot Navigation with Limited Field-Of-View in Unknown Dynamic Environments, pp. 2985-2991.

Bouraine, Sara (cdta), Fraichard, Thierry (INRIA), Hassen, Salhi (U. BLIDA)

14:45-14:50	WeCT3.4

Capacitive Skin Sensors for Robot Impact Monitoring, pp. 2992-2997.

Phan, Samson (Stanford Univ.), Quek, Zhan Fan (Stanford Univ.), Shah, Preyas (Stanford Univ.), Shin, Dongjun (Stanford Univ.), Ahmed, Zubair (Stanford Univ.), Khatib, Oussama (Stanford Univ.), Cutkosky, Mark (Stanford Univ.)

14:50-14:55	WeCT3.5

Instantaneous Stiffness Effects on Impact Forces in Human-Friendly Robots, pp. 2998-3003.

Shin, Dongjun (Stanford Univ.), Quek, Zhan Fan (Stanford Univ.), Phan, Samson (Stanford Univ.), Cutkosky, Mark (Stanford Univ.), Khatib, Oussama (Stanford Univ.)

14:55-15:00	WeCT3.6

Fast Computation of Wheel-Soil Interactions for Safe and Efficient Operation of Mobile Robots, pp. 3004-3010.

Jia, Zhenzhong (Univ. of Michigan), Smith, William (Univ. of Michigan), Peng, Huei (Univ. of MIchigan)

15:00-15:15	WeCT3.7

Online Data-Driven Fault Detection for Robotic Systems, pp. 3011-3016.

Golombek, Raphael (Res. Inst. for Cognition and Robotics, Bielefeld Univ.), Wrede, Sebastian (Bielefeld Univ.), Hanheide, Marc (Univ. of Birmingham), Heckmann, Martin (Honda Res. Inst. Europe GmbH)

15:15-15:30	WeCT3.8

Containment Indicator Function Construction Via Numerical Conformal Mapping, pp. 3017-3022.

Han, Shuo (California Inst. of Tech.), Murray, Richard (California

Inst. of Tech.)

WeCT4	Continental Ballroom 4
Symposium: Haptic Feedback and System Evaluation (Invited Session)	
Chair: O'Malley, Marcia	Rice Univ.
Co-Chair: Yokokohji, Yasuyoshi	Kobe Univ.
Organizer: O'Malley, Marcia	Rice Univ.
Organizer: Kuchenbecker, Katherine J.	Univ. of Pennsylvania
Organizer: Yokokohji, Yasuyoshi	Kobe Univ.

14:00-14:15	WeCT4.1

The Sigma.7 Haptic Interface for MiroSurge: A New Bi-Manual Surgical Console, pp. 3023-3030. Attachment

Tobergte, Andreas (German Aerospace Center (DLR)), Helmer, Patrick (Force Dimension), Hagn, Ulrich (DLR German Aerospace Center), Thielmann, Sophie Charlotte Franziska (German Aerospace Center), Albu-Schäffer, Alin (DLR - German Aerospace Center), Hirzinger, Gerd (German Aerospace Center (DLR)), Conti, Francois (Stanford Univ.), Grange, Sebastien (Force Dimension)

14:15-14:30	WeCT4.2

Haptic Coupling with Augmented Feedback between Two KUKA Light-Weight Robots and the PR2 Robot Arms, pp. 3031-3038.

Buys, Koen (KU Leuven), Bellens, Steven (Katholieke Univ. Leuven), Decré, Wilm (Katholieke Univ. Leuven), Smits, Ruben (Katholieke Univ. Leuven), Scioni, Enea (Univ. di Ferrara), De Laet, Tinne (Katholieke Univ. Leuven), De Schutter, Joris (Katholieke Univ. Leuven), Bruyninckx, Herman (Katholieke Univ. Leuven)

14:30-14:45	WeCT4.3

Measuring an Operator's Maneuverability Performance in the Haptic Teleoperation of Multiple Robots, pp. 3039-3046.

Son, Hyoung Il (Max Planck Inst. for Biological Cybernetics), Chuang, Lewis L. (Max Planck Inst. for Biological Cybernetics, Tübingen), Franchi, Antonio (Max Planck Inst. for Biological Cybernetics), Kim, Junsuk (Korea Univ.), Lee, Dongjun (Univ. of Tennessee-Knoxville), Lee, Seong-Whan (Korea Univ.), Buelthoff, Heinrich H. (Max Planck Inst. for Biol. Cybernetics), Robuffo Giordano, Paolo (Max Planck Inst. for Biological Cybernetics)

14:45-14:50	WeCT4.4

Bilateral Physical Interaction with a Robot Manipulator through a Weighted Combination of Flow Fields, pp. 3047-3052. Attachment

Pistillo, Antonio (Istituto Italiano di Tecnologia), Calinon, Sylvain (Istituto Italiano di Tecnologia), Caldwell, Darwin G. (Italian Inst. of Tech.)

14:50-14:55	WeCT4.5

Motion Control of a Semi-Mobile Haptic Interface for Extended Range Telepresence, pp. 3053-3059.

Pérez Arias, Antonia (Karlsruhe Inst. of Tech. (KIT)), Hanebeck, Uwe D. (Karlsruhe Inst. of Tech. (KIT))

14:55-15:00	WeCT4.6

An Objective Index That Substitutes for Subjective Quality of Vibrotactile Material-Like Textures, pp. 3060-3067.

Okamoto, Shogo (Nagoya Univ.), Yamada, Yoji (Nagoya Univ.)

15:00-15:15	WeCT4.7

Assistance or Challenge? Filling a Gap in User-Cooperative Control, pp. 3068-3073.

Rauter, Georg (ETH Zurich), Sigrist, Roland (ETH Zurich, Inst. of Robotics and Intelligent Systems, Senso), Marchal-Crespo, Laura

(ETH Zurich), Vallery, Heike (ETH Zurich), Riener, Robert (ETH Zurich), Wolf, Peter (ETH Zurich, Inst. of Robotics and Intelligent Systems, Senso)

15:15-15:30	WeCT4.8

Design and Characterization of the ReHapticKnob, a Robot for Assessment and Therapy of Hand Function, pp. 3074-3080.

Metzger, Jean-Claude (ETH Zurich), Lambercy, Olivier (ETH Zurich), Chapuis, Dominique (Ec. Pol. Federale de Lausanne), Gassert, Roger (ETH Zurich)

WeCT5	Continental Ballroom 5

Symposium: Symbolic Approaches to Motion Planning and Control (Invited Session)

Chair: Kress-Gazit, Hadas	Cornell Univ.
Co-Chair: Belta, Calin	Boston Univ.
Organizer: Belta, Calin	Boston Univ.
Organizer: Kress-Gazit, Hadas	Cornell Univ.

14:00-14:15	WeCT5.1

LTL-Based Decentralized Supervisory Control of Multi-Robot Tasks Modelled As Petri Nets (I), pp. 3081-3086.

Lacerda, Bruno (Inst. for Systems and Robotics, Inst. Superior Técnico), Lima, Pedro (Inst. Superior Técnico - Inst. for Systems and Robotics)

14:15-14:30	WeCT5.2

Optimal Multi-Robot Path Planning with Temporal Logic Constraints (I), pp. 3087-3092. Attachment

Ulusoy, Alphan (Boston Univ.), Smith, Stephen L. (Univ. of Waterloo), Ding, Xu Chu (Boston Univ.), Belta, Calin (Boston Univ.), Rus, Daniela (MIT)

14:30-14:45	WeCT5.3

Foundations of Formal Language for Humans and Artificial Systems Based on Intrinsic Structure in Spatial Behavior (I), pp. 3093-3100.

Kong, Zhaodan (Univ. of Minnesota), Mettler, Bernie (Univ. of Minnesota)

14:45-14:50	WeCT5.4

Minimalist Multiple Target Tracking Using Directional Sensor Beams (I), pp. 3101-3107.

Bobadilla, Leonardo (Univ. of Illinois), Sanchez Plazas, Oscar (Univ. of Illinois at Urbana-Champaign), Czarnowski, Justin (Univ. of Illinois at Urbana-Champaign), LaValle, Steven M (Univ. of Illinois)

14:50-14:55	WeCT5.5

Temporal Logic Control in Dynamic Environments with Probabilistic Satisfaction Guarantees, pp. 3108-3113.

Medina Ayala, Ana Ivonne (Boston Univ.), Andersson, Sean (Boston Univ.), Belta, Calin (Boston Univ.)

14:55-15:00	WeCT5.6

Computing Unions of Inevitable Collision States and Increasing Safety to Unexpected Obstacles, pp. 3114-3119. Attachment

Althoff, Daniel (Tech. Univ. München), Brand, Christoph Norbert (Tech. Univ. München), Wollherr, Dirk (Tech. Univ. München), Buss, Martin (Tech. Univ. München)

15:00-15:15	WeCT5.7

High-Level Control of Modular Robots (I), pp. 3120-3125. Attachment

Castro, Sebastian (Cornell Univ.), Koehler, Sarah (Cornell Univ.), Kress-Gazit, Hadas (Cornell Univ.)

15:15-15:30	WeCT5.8

Synthesis of Feedback Controllers for Multiple Aerial Robots with Geometric Constraints (I), pp. 3126-3131. Attachment

Ayanian, Nora (Univ. of Pennsylvania), Kallem, Vinutha (Univ. of Pennsylvania), Kumar, Vijay (Univ. of Pennsylvania)

WeCT6	Continental Ballroom 6

Symposium: Marine Robotics: Platforms and Applications (Invited Session)

Chair: Smith, Ryan	Queensland Univ. of Tech.
Co-Chair: Antonelli, Gianluca	Univ. degli Studi di Cassino
Organizer: Smith, Ryan	Queensland Univ. of Tech.
Organizer: Zhang, Fumin	Georgia Inst. of Tech.
Organizer: Kondo, Hayato	Tokyo Univ. of Marine Science and Tech.
Organizer: Antonelli, Gianluca	Univ. degli Studi di Cassino

14:00-14:15	WeCT6.1

Semi-Plenary Invited Talk: Wiring an Interactive Ocean*.

Delaney, John (Univ. of Washington)

14:30-14:45	WeCT6.3

Towards Mixed-Initiative, Multi-Robot Field Experiments: Design, Deployment, and Lessons Learned (I), pp. 3132-3139.

Das, Jnaneshwar (Univ. of Southern California), Maughan, Thom (Monterey Bay Aquarium Res. Inst.), McCann, Mike (Monterey Bay Aquarium Res. Inst.), Godin, Mike (Monterey Bay Aquarium Res. Inst.), O'Reilly, Tom (Monterey Bay Aquarium Res. Inst.), Messié, Monique (Monterey Bay Aquarium Res. Inst.), Bahr, Fred (Monterey Bay Aquarium Res. Inst.), Gomes, Kevin (Monterey Bay Aquarium Res. Inst.), Py, Frederic (Monterey Bay Aquarium Res. Inst.), Bellingham, James G. (Monterey Bay Aquarium Res. Inst.), Sukhatme, Gaurav (Univ. of Southern California), Rajan, Kanna (Monterey Bay Aquarium Res. Inst.)

14:45-14:50	WeCT6.4

Current-Sensitive Path Planning for an Underactuated Free-Floating Ocean Sensorweb (I), pp. 3140-3146.

Dahl, Kristen (California Inst. of Tech.), Thompson, David (JPL/ California Inst. of Tech.), McLaren, David (JPL/ California Inst. of Tech.), Chao, Yi (California Inst. of Tech.), Chien, Steve (Jet Propulsion Lab.)

14:50-14:55	WeCT6.5

Toward Risk Aware Mission Planning for Autonomous Underwater Vehicles (I), pp. 3147-3153.

de Menezes Pereira , Arvind A. (Univ. of Southern California), Binney, Jonathan (Univ. of Southern California), Jones, Burton (Univ. of Southern California), Ragan, Matthew (Univ. of Southern California), Sukhatme, Gaurav (Univ. of Southern California)

14:55-15:00	WeCT6.6

AUV Docking on a Moving Submarine Using a K-R Navigation Function, pp. 3154-3159.

Sujit, P.B. (Univ. of Porto), Healey, Anthony J. (Naval Postgraduate School), Sousa, João (Univ. Porto - Faculdade Engenharia)

15:00-15:15	WeCT6.7

Obstacle Detection from Overhead Imagery Using Self-Supervised Learning for Autonomous Surface Vehicles (I), pp. 3160-3165.

Heidarsson, Hordur K (Univ. of Southern California), Sukhatme, Gaurav (Univ. of Southern California)

15:15-15:30	WeCT6.8

Observability Metric for the Relative Localization of AUVs Based on Range and Depth Measurements: Theory and Experiments (I), pp. 3166-3171. Attachment

Arrichiello, Filippo (Univ. di Cassino), Antonelli, Gianluca (Univ. degli Studi di Cassino), Aguiar, António (Insituto Superior Técnico), Pascoal, Antonio (Inst. Superior Tecnico)

WeCT7	Continental Parlor 7
Humanoid Control (Regular Session)	

Chair: Yoshida, Eiichi	National Inst. of AIST
Co-Chair: De Luca, Alessandro	Univ. di Roma "La Sapienza"

14:00-14:15	WeCT7.1

Logic Programming with Simulation-Based Temporal Projection for Everyday Robot Object Manipulation, pp. 3172-3178.

Kunze, Lars (Tech. Univ. Muenchen), Dolha, Mihai Emanuel (Tech. Univ. München), Beetz, Michael (Tech. Univ. München)

14:15-14:30	WeCT7.2

Experimental Evaluation of a Trajectory/Force Tracking Controller for a Humanoid Robot Cleaning a Vertical Surface, pp. 3179-3184.

Sato, Fuyuki (Tokyo City Univ.), Nishii, Tatsuya (Tokyo City Univ.), Takahashi, Jun (Tokyo City Univ.), Yoshida, Yuki (Tokyo City Univ.), Mitsuhashi, Masaru (Tokyo City Univ.), Nenchev, Dragomir (Tokyo City Univ.)

14:30-14:45	WeCT7.3

Switching Multiple LQG Controllers Based on Bellman's Optimality Principle: Using Full-State Feedback to Control a Humanoid Robot, pp. 3185-3191. Attachment

Sugimoto, Norikazu (ATR Computational Neuroscience Lab.), Morimoto, Jun (ATR Computational Neuroscience Lab.)

14:45-14:50	WeCT7.4

Adaptive Predictive Gaze Control of a Redundant Humanoid Robot Head, pp. 3192-3198. Attachment

Milighetti, Giulio (Fraunhofer-Gesellschaft), Vallone, Luca (DIS, Univ. di Roma "La Sapienza"), De Luca, Alessandro (Univ. di Roma "La Sapienza")

14:50-14:55	WeCT7.5

Dynamic Whole-Body Mobile Manipulation with a Torque Controlled Humanoid Robot Via Impedance Control Laws, pp. 3199-3206. Attachment

Dietrich, Alexander (German Aerospace Center (DLR)), Wimboeck, Thomas (German Aerospace Center (DLR)), Albu-Schäffer, Alin (DLR - German Aerospace Center)

14:55-15:00	WeCT7.6

Gait Pattern Generation and Stabilization for Humanoid Robot Based on Coupled Oscillators, pp. 3207-3212. Attachment

Ha, Inyong (The Univ. of Tokyo), Tamura, Yusuke (The Univ. of Tokyo), Asama, Hajime (The Univ. of Tokyo)

15:00-15:15	WeCT7.7

A Computational Approach for Push Recovery in Case of Multiple Noncoplanar Contacts, pp. 3213-3220.

Mansour, Darine (Commissariat à l'Energie Atomique (CEA)), Micaelli, Alain (Commissariat à l'Energie Atomique), Lemerle, Pierre (Inst. National de Recherche et de Sécurité)

15:15-15:30	WeCT7.8

Stretched Knee Walking with Novel Inverse Kinematics for Humanoid Robots, pp. 3221-3226. Attachment

Kryczka, Przemyslaw (Waseda Univ.), Hashimoto, Kenji (Waseda Univ.), Kondo, Hideki (Waseda Univ.), Omer, Aiman (Waseda Univ.), Lim, Hun-ok (Kanagawa Univ.), Takanishi, Atsuo (Waseda Univ.)

WeCT8	Continental Parlor 8
Multirobot Planning (Regular Session)	

Chair: Du Toit, Noel E.	California Inst. of Tech.
Co-Chair: Berman, Spring	Harvard Univ.

14:00-14:15	WeCT8.1

Multiple Agent Coordination for Stochastic Target Interception Using MILP, pp. 3227-3234.

Shende, Apoorva (Virginia Tech.), Bays, Matthew (Virginia Tech.), Stilwell, Daniel (Virginia Tech.)

14:15-14:30	WeCT8.2

Using Minimal Communication to Improve Decentralized Conflict Resolution for Non-Holonomic Vehicles, pp. 3235-3240.

Krontiris, Athanasios (Univ. of Nevada, Reno), Bekris, Kostas E. (Univ. of Nevada, Reno)

14:30-14:45	WeCT8.3

A Reciprocal Sampling Algorithm for Lightweight Distributed Multi-Robot Localization, pp. 3241-3247.

Prorok, Amanda (EPFL), Martinoli, Alcherio (EPFL)

14:45-14:50	WeCT8.4

Localization Using Ambiguous Bearings from Radio Signal Strength (I), pp. 3248-3253.

Derenick, Jason (Univ. of Pennsylvania), Fink, Jonathan (Univ. of Pennsylvania), Kumar, Vijay (Univ. of Pennsylvania)

14:50-14:55	WeCT8.5

Planning for Multi-Robot Exploration with Multiple Objective Utility Functions, pp. 3254-3259. Attachment

Butzke, Jonathan (Carnegie Mellon Univ.), Likhachev, Maxim (Carnegie Mellon Univ.)

14:55-15:00	WeCT8.6

M*: A Complete Multirobot Path Planning Algorithm with Performance Bounds, pp. 3260-3267. Attachment

Wagner, Glenn (Carnegie Mellon), Choset, Howie (Carnegie Mellon Univ.)

15:00-15:15	WeCT8.7

Efficient and Complete Centralized Multi-Robot Path Planning, pp. 3268-3275. Attachment

Luna, Ryan (Univ. of Nevada Reno), Bekris, Kostas E. (Univ. of Nevada, Reno)

15:15-15:30	WeCT8.8

ARMO: Adaptive Road Map Optimization for Large Robot Teams, pp. 3276-3282.

Kleiner, Alexander (Univ. of Freiburg), Sun, Dali (Univ. of Freiburg), Meyer-Delius, Daniel (KUKA Lab. GmbH)

WeCT9	Continental Parlor 9
Visual & Multi-Sensor Calibration (Regular Session)	

Chair: Kelly, Jonathan	USC
Co-Chair: Birbach, Oliver	DFKI

14:00-14:15	WeCT9.1

Extrinsic Calibration of a Single Line Scanning Lidar and a Camera, pp. 3283-3289.

Kwak, Kiho (Carnegie Mellon Univ.), Huber, Daniel (CMU), Badino, Hernan (Carnegie Mellon Univ.), Kanade, Takeo (Carnegie Mellon Univ.)

14:15-14:30	WeCT9.2

A Novel 2.5D Pattern for Extrinsic Calibration of ToF and Camera Fusion System, pp. 3290-3296.

Jung, Jiyoung (KAIST), Jeong, Yekeun (KAIST), Park, Jaesik (KAIST), Ha, Hyowon (KAIST), Kim, James Dokyoon (Samsung Advanced Inst. of Tech.), Kweon, In So (KAIST)

14:30-14:45	WeCT9.3

Optimization Based IMU Camera Calibration, pp. 3297-3304.

Fleps, Michael (TUM), Mair, Elmar (Tech. Univ. München (TUM)), Ruepp, Oliver (Tech. Univ. Munich), Suppa, Michael (German Aerospace Center (DLR)), Burschka, Darius (Tech. Univ. Muenchen)

14:45-14:50	WeCT9.4

Rapid Development of Manifold-Based Graph Optimization Systems for Multi-Sensor Calibration and SLAM, pp. 3305-3312.

Wagner, René (Deutsches Forschungszentrum für Künstliche Intelligenz GmbH), Birbach, Oliver (DFKI), Frese, Udo (Univ. Bremen)

14:50-14:55	WeCT9.5

Two-Phase Online Calibration for Infrared-Based Inter-Robot Positioning Modules, pp. 3313-3319.

Gowal, Sven (EPFL), Prorok, Amanda (EPFL), Martinoli, Alcherio (EPFL)

14:55-15:00	WeCT9.6

Self Calibration of a Vision System Embedded in a Visual SLAM Framework, pp. 3320-3326. Attachment

Joly, Cyril (INRIA Sophia Antipolis Méditerannée), Rives, Patrick (INRIA)

15:00-15:15	WeCT9.7

High-Accuracy Hand-Eye Calibration from Motion on Manifolds, pp. 3327-3334.

Vicentini, Federico (Italian National Res. Council (CNR)), Pedrocchi, Nicola (National Res. Council), Malosio, Matteo (National Res. Council), Molinari Tosatti, Lorenzo (National Council of Res.)

15:15-15:30	WeCT9.8

A Nonlinear Observer Approach for Concurrent Estimation of Pose, IMU Bias and Camera-To-IMU Rotation, pp. 3335-3341. Attachment

Scandaroli, Glauco Garcia (INRIA), Morin, Pascal (INRIA), Silveira, Geraldo (CTI)

WeCPT10	Golden Gate Room
Interactive VII (Interactive Session)	

14:00-15:30	WeCPT10.1

Study on a Practical Robotic Follower to Support Home Oxygen Therapy Patients -Development and Control of a Mobile Platform*.

Tani, Atsushi (Tokyo Inst. of Tech.), Endo, Gen (Tokyo Inst. of Tech.), Fukushima, Edwardo F. (Tokyo Inst. of Tech.), Hirose, Shigeo (Tokyo Inst. of Tech.), Iribe, Masatsugu (Osaka Electro-Communication Univ.), Takubo, Toshio (Tokyo Women's Medical Univ.)

14:00-15:30	WeCPT10.2

Progress in Developing a Socially Assistive Mobile Home Robot Companion for the Elderly with Mild Cognitive Impairment*.

Gross, Horst-Michael (Ilmenau Univ. of Tech.)

14:00-15:30	WeCPT10.3

Wheelchair Navigation Assisted by Human-Machine Shared-Control and a P300-Based Brain Computer Interface*.

Lopes, Ana (Univ. of Coimbra), Pires, Gabriel (Univ. of Coimbra), Vaz, Luís (Univ. of Coimbra), Nunes, Urbano (Univ. de Coimbra)

14:00-15:30	WeCPT10.4

A Sensor Fusion Approach to Angle and Angular Rate Estimation*.

Kubus, Daniel (Tech. Univ. Braunschweig), Wahl, Friedrich M. (Tech. Univ. of Braunschweig)

14:00-15:30	WeCPT10.5

Combining Multiple Sensor Modalities for a Localisation Robust to Smoke*.

Brunner, Christopher Joseph (The Univ. of Sydney), Peynot, Thierry (The Univ. of Sydney), Vidal-Calleja, Teresa A. (Univ. of Sydney)

14:00-15:30	WeCPT10.6

Multisensor Data Fusion for Robust Pose Estimation of a Six-Legged Walking Robot*.

Stelzer, Annett (DLR German Aerospace Center), Hirschmüller, Heiko (German Aerospace Center (DLR)), Goerner, Martin (German Aerospace Center (DLR))

14:00-15:30	WeCPT10.7

Towards Validation of Robotic Surgery Training Assessment across Training Platforms*.

Gao, Yixin (Johns Hopkins Univ.), Sedef, Mert (Koc Univ.), Jog, Amod (Johns Hopkins Univ.), Hager, Gregory (Johns Hopkins Univ.), Berkley, Jeff (MIMIC Tech. Inc), Kumar, Rajesh (Johns Hopkins Univ.)

14:00-15:30	WeCPT10.8

Adaptive Path Planning for Steerable Needles Using Duty-Cycling*.

Bernardes, Mariana Costa (Univ. of Montpellier 2 / CNRS - LIRMM), Adorno, Bruno Vilhena (Univ. of Montpellier 2 / CNRS - LIRMM), Poignet, Philippe (LIRMM UMR 5506 CNRS UM2), Zemiti, Nabil (Univ. Montpellier II - CNRS UMR 5506), Borges, Geovany Araujo (Univ. de Brasilia)

14:00-15:30	WeCPT10.9

An Analytical Model for Deflection of Flexible Needles During Needle Insertion*.

Asadian, Ali (The Univ. of Western Ontario (UWO)), Kermani, Mehrdad R. (Univ. of Western Ontario), Patel, Rajnikant V. (The Univ. of Western Ontario)

14:00-15:30	WeCPT10.10

Two Hands Are Better Than One: Assisting Users with Multi-Robot Manipulation Tasks*.

Lewis, Bennie (Univ. of Central Florida), Sukthankar, Gita (Univ. of Central Florida)

14:00-15:30	WeCPT10.11

3-DOF Haptic Feedback for Assisted Driving of an Omnidirectional Wheelchair*.

Christensen, Quinton (Univ. of Utah), Mascaro, Stephen (Univ. of Utah)

14:00-15:30	WeCPT10.12

Configuration-Based Optimization for Six Degree-Of-Freedom Haptic Rendering Using Sphere-Trees*.

Zhang, Xin (Beihang Univ.), Wang, Dangxiao (Beihang Univ.), Zhang, Yuru (Beihang Univ.), Xiao, Jing (UNC-Charlotte)

14:00-15:30	WeCPT10.13

Finding Critical Changes in Dynamic Configuration Spaces (I)*.

Lu, Yanyan (George Mason Univ.), Lien, Jyh-Ming (George Mason Univ.)

14:00-15:30	WeCPT10.14

Toggle PRM: Simultaneous Mapping of C-Free and C-Obstacle - a Study in 2D - (I)*.

Denny, Jory (Texas A&M Univ.), Amato, Nancy (Texas A&M Univ.)

14:00-15:30	WeCPT10.15

Sampling Heuristics for Optimal Motion Planning in High Dimensions*.

Akgun, Baris (Georgia Inst. of Tech.), Stilman, Mike (Georgia Tech.)

14:00-15:30	WeCPT10.16

Embedded Robust Nonlinear Control for a Four-Rotor Rotorcraft: Validation in Real-Time with Wind Disturbances*.

Muñoz Hernandez, Laura Elena (HEUDIASYC UMR UTC 6599),

Castillo, Pedro (Univ. de Tech. de Compiègne), Sanahuja, Guillaume (Univ. de Tech. de Compiègne), Santos Sanchez, Omar Jacobo (Univ. Autonoma del Estado de Hidalgo, Mexico)

14:00-15:30	WeCPT10.17

Differential Flatness Based Control of a Rotorcraft for Aggressive Maneuvers*.

Ferrin, Jeffrey (Brigham Young Univ.), Leishman, Robert (Brigham Young Univ.), Beard, Randy (Brigham Young Univ.), McLain, T.W. (Bringham Young Univ.)

14:00-15:30	WeCPT10.18

Robust Embedded Egomotion Estimation (I)*.

Voigt, Rainer (ETH Zurich), Nikolic, Janosch (ETH Zürich), Hürzeler, Christoph (ETH Zürich), Weiss, Stephan (ETH Zurich), Kneip, Laurent (ETHZ), Siegwart, Roland (ETH Zurich)

14:00-15:30	WeCPT10.19

Development and Experiment of a Kneed Biped Walking Robot Based on Parametric Excitation Principle*.

Banno, Yoshihisa (Nagoya Univ.), Harata, Yuji (Hiroshima Univ.), Taji, Kouichi (Nagoya Unviersity), Uno, Yoji (Nagoya Univ.)

14:00-15:30	WeCPT10.20

Switchblade: An Agile Treaded Rover*.

Morozovsky, Nicholas (Univ. of California San Diego), Schmidt-Wetekam, Christopher (Univ. of California San Diego), Bewley, Thomas (Flow Control & Coordinated Robotics Lab.)

14:00-15:30	WeCPT10.21

Passive Dynamic Walking of Combined Rimless Wheel and Its Speeding-Up by Adjustment of Phase Difference*.

Inoue, Ryosuke (Japan Advanced Inst. of Science and Tech.), Asano, Fumihiko (Japan Advanced Inst. of Science and Tech.), Tanaka, Daiki (Japan Advanced Inst. of Science and Tech.), Tokuda, Isao (Japan Advanced Inst. of Science and Tech.)

14:00-15:30	WeCPT10.22

Market-Based Coordination of Coupled Robot Systems*.

Xu, Ling (Carnegie Mellon Univ.), Stentz, Anthony (Carnegie Mellon Univ.)

14:00-15:30	WeCPT10.23

Event-Driven Gaussian Process for Object Localization in Wireless Sensor Networks*.

Yoo, Jae Hyun (Seoul National Univ.), Kim, Woojin (School of Mechanical and Aerospace Engineering, Seoul National Univ.), Kim, H. Jin (Seoul National Univ.)

14:00-15:30	WeCPT10.24

Multi-Robot Patrolling with Coordinated Behaviours in Realistic Environments*.

Iocchi, Luca (Sapienza Univ. of Roma), Marchetti, Luca (Sophia Antipolis - Méditerranée), Nardi, Daniele (Sapienza Univ. of Rome)

14:00-15:30	WeCPT10.25

Improving Ultrasound Intensity-Based Visual Servoing: Tracking and Positioning Tasks with 2D and Bi-Plane Probes*.

Nadeau, Caroline (IRISA, INRIA Rennes-Bretagne Atlantique), Krupa, Alexandre (INRIA Rennes - Bretagne Atlantique)

14:00-15:30	WeCPT10.26

Automatic Landing on Aircraft Carrier by Visual Servoing*.

Coutard, Laurent (INRIA Rennes - Bretagne Atlantique), Chaumette, Francois (INRIA Rennes-Bretagne Atlantique), Pflimlin, Jean-Michel (laas-cnrs)

14:00-15:30	WeCPT10.27

Combining IBVS and PBVS to Ensure the Visibility Constraint*.

Kermorgant, Olivier (INRIA Rennes-Bretagne Atlantique), Chaumette, Francois (INRIA Rennes-Bretagne Atlantique)

WeDT1	Continental Parlor 1
Human-Robot Collaboration (Regular Session)	
Chair: Inamura, Tetsunari	National Inst. of Informatics
Co-Chair: Croft, Elizabeth	Univ. of British Columbia

16:00-16:15	WeDT1.1

Enhanced Visual Scene Understanding through Human-Robot Dialog, pp. 3342-3348. Attachment

Johnson-Roberson, Matthew (Univ. of Sydney), Bohg, Jeannette (KTH Stockholm), Skantze, Gabriel (Department for Speech, Music and Hearing, CSC, KTH Stockholm), Gustafson, Joakim (Department for Speech, Music and Hearing, CSC, KTH Stockholm), Carlson, Rolf (Department for Speech, Music and Hearing, CSC, KTH Stockholm), Rasolzadeh, Babak (KTH), Kragic, Danica (KTH)

16:15-16:30	WeDT1.2

Intention-Based Coordination and Interface Design for Human-Robot Cooperative Search, pp. 3349-3354.

Xie, Dan (Univ. of Massachusetts Amherst), Grupen, Rod (Univ. of Massachusetts), Lin, Yun (Univ. of Massachusetts Amherst), Hanson, Allen (Univ. of Massachusetts Amherst)

16:30-16:45	WeDT1.3

Towards Safe Physical Human-Robot Collaboration: A Projection-Based Safety System, pp. 3355-3360. Attachment

Vogel, Christian (Fraunhofer IFF), Poggendorf, Maik (Fraunhofer Inst. for Factory Operation and Automation IFF), Walter, Christoph (Fraunhofer IFF), Elkmann, Norbert (Fraunhofer IFF)

16:45-16:50	WeDT1.4

Experimental Investigation of Human-Robot Cooperative Carrying, pp. 3361-3366.

Parker, Chris (Univ. of British Columbia), Croft, Elizabeth (Univ. of British Columbia)

16:50-16:55	WeDT1.5

A Human-Centered Approach to Robot Gesture Based Communication within Collaborative Working Processes, pp. 3367-3374.

Ende, Tobias (DLR (German Aerospace Center)), Haddadin, Sami (German Aerospace Center (DLR)), Parusel, Sven (German Aerospace Center), Wüsthoff, Tilo (DLR), Hassenzahl, Marc (Folkwang Univ. der Künste), Albu-Schäffer, Alin (DLR - German Aerospace Center)

16:55-17:00	WeDT1.6

Human Workflow Analysis Using 3D Occupancy Grid Hand Tracking in a Human-Robot Collaboration Scenario, pp. 3375-3380. Attachment

Lenz, Claus (Tech. Univ. München), Sotzek, Alice (Tech. Univ. München), Röder, Thorsten (Tech. Univ. München), Radrich, Helmuth (Tech. Univ. München), Huber, Markus (LMU Munich), Glasauer, Stefan (Ludwig-Maximilian Univ.), Knoll, Alois (TU Munich)

17:00-17:15	WeDT1.7

Motion Coaching with Emphatic Motions and Adverbially Expression for Human Beings by Robotic System --Method for Controlling Motions and Expressions with Solo Parameter, pp. 3381-3386.

Okuno, Keisuke (The Graduate Univ. for Advanced Studies), Inamura, Tetsunari (National Inst. of Informatics)

17:15-17:30	WeDT1.8

A System for Interactive Learning in Dialogue with a Tutor, pp. 3387-3394.

Skocaj, Danijel (Univ. of Ljubljana), Kristan, Matej (Univ. of Ljubljana, Faculty of Computer and Information Sci), Vrecko, Alen

(Univ. of Ljubljana, Faculty of Computer andInformation Scie), Mahnič, Marko (Univ. of Ljubljana), Janicek, Miroslav (German Res. Center for Artificial Intelligence, DFKI G), Kruijff, Geert-Jan (German Res. Center for AI), Hanheide, Marc (Univ. of Birmingham), Hawes, Nick (Univ. of Birmingham), Keller, Thomas (Univ. of Freiburg), Zillich, Michael (Vienna Univ. of Tech.), Zhou, Kai (Automation and Control Inst. Vienna Univ. of Tech.)

WeDT2	Continental Parlor 2

Recognition & Prediction of Motion (Regular Session)

Chair: Calinon, Sylvain	Italian Inst. of Tech.
Co-Chair: Chitta, Sachin	Willow Garage Inc.

16:00-16:15	WeDT2.1

Realtime Recognition of Complex Daily Activities Using Dynamic Bayesian Network, pp. 3395-3400.

Zhu, Chun (Oklahoma State Univ.), Sheng, Weihua (Oklahoma State Univ.)

16:15-16:30	WeDT2.2

Motion Data Retrieval Based on Statistic Correlation between Motion Symbol Space and Language, pp. 3401-3406.

Hamano, Seiya (Univ. of Tokyo), Takano, Wataru (Univ. of Tokyo), Nakamura, Yoshihiko (Univ. of Tokyo)

16:30-16:45	WeDT2.3

Movement Segmentation Using a Primitive Library, pp. 3407-3412.

Meier, Franziska (Univ. of Southern California), Theodorou, Evangelos (Univ. of Southern California), Stulp, Freek (Univ. of Southern California), Schaal, Stefan (Univ. of Southern California)

16:45-16:50	WeDT2.4

Encoding the Time and Space Constraints of a Task in Explicit-Duration Hidden Markov Model, pp. 3413-3418. Attachment

Calinon, Sylvain (Istituto Italiano di Tecnologia), Pistillo, Antonio (Istituto Italiano di Tecnologia), Caldwell, Darwin G. (Italian Inst. of Tech.)

16:50-16:55	WeDT2.5

Behavior Prediction from Trajectories in a House by Estimating Transition Model Using Stay Points, pp. 3419-3425. Attachment

Mori, Taketoshi (The Univ. of Tokyo), Tominaga, Shoji (The Univ. of Tokyo), Noguchi, Hiroshi (The Univ. of Tokyo), Shimosaka, Masamichi (Univ. of Tokyo), Fukui, Rui (The Univ. of Tokyo), Sato, Tomomasa (The Univ. of Tokyo)

16:55-17:00	WeDT2.6

Estimation and Prediction of Multiple Flying Balls Using Probability Hypothesis Density Filtering, pp. 3426-3433. Attachment

Birbach, Oliver (DFKI), Frese, Udo (Univ. Bremen)

17:00-17:15	WeDT2.7

Trajectory Prediction of Spinning Ball for Ping-Pong Player Robot, pp. 3434-3439.

Huang, Yanlong (Inst. of Automation, Chinese Acad. of Sciences), Xu, De (Inst. of Automation, Chinese Acad. of Sciences), Tan, Min (Inst. of Automation,Chinese Acad. of Sciences), Su, Hu (Inst. of Automation, Chinese Acad. of Sciences)

17:15-17:30	WeDT2.8

Invariant Trajectory Indexing for Real Time 3D Motion Recognition, pp. 3440-3445.

Yang, Jianyu (Joint Advanced Res. Centre of City Univ. and), Li, Y.F. (City Univ. of Hong Kong), Wang, Keyi (Univ. of Science and Tech. of China)

WeDT3	Continental Parlor 3

Haptic Rendering & Object Recognition (Regular Session)

Chair: Cavusoglu, M. Cenk	Case Western Res. Univ.
Co-Chair: Konyo, Masashi	Tohoku Univ.

16:00-16:15	WeDT3.1

A Comparison of Encoding Schemes for Haptic Object Recognition Using a Biologically Plausible Spiking Neural Network, pp. 3446-3453.

Ratnasingam, Sivalogeswaran (Univ. of Ulster), McGinnity, Martin (Univ. of Ulster)

16:15-16:30	WeDT3.2

Study on Lower Back Electrotactile Stimulation Characteristics for Prosthetic Sensory Feedback, pp. 3454-3459.

Seps, Monika (Swiss Federal Inst. of Tech. Zurich (ETHZ)), Dermitzakis, Konstantinos (Univ. of Zurich), Hernandez Arieta, Alejandro (Artificial Intelligence Lab. Univ. of Zurich)

16:30-16:45	WeDT3.3

Effect of Visuo-Haptic Co-Location on 3D Fitts' Task Performance, pp. 3460-3467.

Fu, Michael J. (Case Western Res. Univ.), Hershberger, Andrew D. (Case Western Res. Univ.), Sano, Kumiko (Case Western Res. Univ.), Cavusoglu, M. Cenk (Case Western Res. Univ.)

16:45-16:50	WeDT3.4

Determining Object Geometry with Compliance and Simple Sensors, pp. 3468-3473.

Jentoft, Leif (Harvard Univ.), Howe, Robert D. (Harvard Univ.)

16:50-16:55	WeDT3.5

Usability of a Virtual Reality System Based on a Wearable Haptic Interface, pp. 3474-3479. Attachment

Kossyk, Ingo (German Aerospace Center (DLR)), Dörr, Jonas (Univ. of Tech. Berlin), Raschendörfer, Lars (Univ. of Tech. Berlin), Kondak, Konstantin (German Aerospace Center)

16:55-17:00	WeDT3.6

Teaching by Touching: Interpretation of Tactile Instructions for Motion Development, pp. 3480-3487.

DallaLibera, Fabio (Padua Univ.), Basoeki, Fransiska (Department of Systems Innovation, Graduate School of Engineering), Minato, Takashi (ATR), Ishiguro, Hiroshi (Osaka Univ.), Menegatti, Emanuele (The Univ. of Padua)

17:00-17:15	WeDT3.7

Enhancement of Human Force Perception by Multi-Point Tactile Stimulation, pp. 3488-3493.

Porquis, Lope Ben (Graduate School of Information Science, Tohoku Univ.), Konyo, Masashi (Tohoku Univ.), Tadokoro, Satoshi (Tohoku Univ.)

17:15-17:30	WeDT3.8

Enhancement of Vibrotactile Sensitivity: Effects of Stationary Boundary Contacts, pp. 3494-3500.

Sakurai, Tatsuma (Tohoku Univ.), Konyo, Masashi (Tohoku Univ.), Tadokoro, Satoshi (Tohoku Univ.)

WeDT5	Continental Ballroom 5

Symposium: Robot Motion Planning: New Frameworks and High Performance (Invited Session)

Chair: Likhachev, Maxim	Carnegie Mellon Univ.
Co-Chair: Alterovitz, Ron	Univ. of North Carolina at Chapel Hill
Organizer: Alterovitz, Ron	Univ. of North Carolina at Chapel Hill
Organizer: Likhachev, Maxim	Carnegie Mellon Univ.

16:00-16:15	WeDT5.1

Multiresolution H-Cost Motion Planning: A New Framework for Hierarchical Motion Planning for Autonomous Mobile Vehicles, pp. 3501-3506.

    Cowlagi, Raghvendra (Georgia Inst. of Tech.), Tsiotras, Panagiotis (Georgia Tech.)

16:15-16:30	WeDT5.2

Multi-Scale LPA* with Low Worst-Case Complexity Guarantees, pp. 3507-3512.

    Lu, Yibiao (Georgia Inst. of Tech.), Huo, Xiaoming (Georgia Inst. of Tech.), Arslan, Oktay (Georgia Inst. of Tech.), Tsiotras, Panagiotis (Georgia Tech.)

16:30-16:45	WeDT5.3

Massively Parallelizing the RRT and the RRT*, pp. 3513-3518.

    Bialkowski, Joshua J (Massachusetts Inst. of Tech.), Karaman, Sertac (Massachusetts Inst. of Tech.), Frazzoli, Emilio (Massachusetts Inst. of Tech.)

16:45-16:50	WeDT5.4

Deterministic Kinodynamic Planning with Hardware Demonstrations, pp. 3519-3525.

    Gaillard, François (ISEN SMAC LIFL), Soulignac, Michaël (ISEN Lille), Dinont, Cédric (ISEN), Mathieu, Philippe (Lab. d'Informatique Fondamentale de Lille Univ. des)

16:50-16:55	WeDT5.5

Navigation Meshes for Realistic Multi-Layered Environments, pp. 3526-3532.

    van Toll, Wouter (Utrecht Univ.), Cook IV, Atlas F. (Utrecht Univ.), Geraerts, Roland (Utrecht Univ.)

16:55-17:00	WeDT5.6

Solving Shortest Path Problems with Curvature Constraints Using Beamlets, pp. 3533-3538.

    Arslan, Oktay (Georgia Inst. of Tech.), Tsiotras, Panagiotis (Georgia Tech.), Huo, Xiaoming (Georgia Inst. of Tech.)

17:00-17:15	WeDT5.7

Adaptive Time Horizon for On-Line Avoidance in Dynamic Environments, pp. 3539-3544.

    Shiller, Zvi (Ariel Univ. Center), Gal, Oren (Tech. - Israel Inst. of Tech.), Raz, Ariel (Ariel Univ. Center of Samaria)

17:15-17:30	WeDT5.8

Spline Templates for Fast Path Planning in Unstructured Environments, pp. 3545-3550. Attachment

    Häselich, Marcel (Univ. of Koblenz-Landau), Handzhiyski, Nikolay (Univ. of Koblenz-Landau), Winkens, Christian (Univ. of Koblenz), Paulus, Dietrich (Univ. Koblenz-Landau)

WeDT6	Continental Ballroom 6

Symposium: Marine Robotics: Control and Planning (Invited Session)

Chair: Zhang, Fumin	Georgia Inst. of Tech.
Co-Chair: Chitre, Mandar	National Univ. of Singapore
Organizer: Smith, Ryan	Queensland Univ. of Tech.
Organizer: Zhang, Fumin	Georgia Inst. of Tech.
Organizer: Kondo, Hayato	Tokyo Univ. of Marine Science and Tech.
Organizer: Antonelli, Gianluca	Univ. degli Studi di Cassino

16:00-16:15	WeDT6.1

Semi-Plenary Invited Talk: Applications of Marine Robotic Vehicles*.

    Yuh, Junku (Korea Aerospace Univ.)

16:30-16:45	WeDT6.3

3D-Surface Reconstruction for Partially Submerged Marine Structures Using an Autonomous Surface Vehicle (I), pp. 3551-3557. Attachment

    Papadopoulos, Georgios (MIT), Kurniawati, Hanna (Singapore -- MIT Alliance for Res. and Tech.), Bin Mohd Shariff, Ahmed Shafeeq (NUS), Wong, Liang Jie (NUS), Patrikalakis, Nicholas (MIT, SMART)

16:45-16:50	WeDT6.4

Path Tracking: Combined Path Following and Trajectory Tracking for Autonomous Underwater Vehicles (I), pp. 3558-3563.

    Xiang, Xianbo (HUST), Lapierre, Lionel (LIRMM), Liu, Chao (LIRMM (UMR5506), CNRS, France), Jouvencel, Bruno (Univ. of Montpellier 2 - CNRS UMR5506 -LIRMM)

16:50-16:55	WeDT6.5

Autonomous Data Collection from Underwater Sensor Networks Using Acoustic Communication (I), pp. 3564-3570. Attachment

    Hollinger, Geoffrey (Univ. of Southern California), Mitra, Urbashi (Univ. of Southern California), Sukhatme, Gaurav (Univ. of Southern California)

16:55-17:00	WeDT6.6

Modeling and Reactive Navigation of an Autonomous Sailboat, pp. 3571-3576.

    Pêtrès, Clément (Univ. Paris VI), Romero-Ramirez, Miguel-Angel (ISIR, UPMC), Plumet, Frederic (UPMC)

17:00-17:15	WeDT6.7

Underwater SLAM with Robocentric Trajectory Using a Mechanically Scanned Imaging Sonar (I), pp. 3577-3582.

    Burguera, Antoni (Univ. de les Illes Balears), Gonzalez, Yolanda (Univ. de les Illes Balears), Oliver, Gabriel A. (Univ. of the Balearic Islands)

17:15-17:30	WeDT6.8

A Lower Bound on Navigation Error for Marine Robots Guided by Ocean Circulation Models (I), pp. 3583-3588.

    Szwaykowska, Klementyna (Georgia Inst. of Tech.), Zhang, Fumin (Georgia Inst. of Tech.)

WeDT7	Continental Parlor 7

Tracking & Gait Analysis (Regular Session)

Chair: Mariottini, Gian Luca	Univ. of Texas at Arlington
Co-Chair: Prattichizzo, Domenico	Istituto Italiano di Tecnologia

16:00-16:15	WeDT7.1

Identification of Mobile Entities Based on Trajectory and Shape Information, pp. 3589-3594.

    Yucel, Zeynep (Advanced Telecommunications Res. Inst.), Ikeda, Tetsushi (ATR), Miyashita, Takahiro (ATR), Hagita, Norihiro (ATR)

16:15-16:30	WeDT7.2

Marathoner Tracking Algorithms for a High Speed Mobile Robot, pp. 3595-3600. Attachment

    Jung, Eui-jung (Hanyang Univ.), Lee, Jae Hoon (Ehime Univ.), Yi, Byung-Ju (Hanyang Univ.), Suh, Il Hong (Hanyang Univ.), Yuta, Shinichi (Univ. of Tsukuba), Noh, Si Tae (Hanyang Univ.)

16:30-16:45	WeDT7.3

Adaptive Human Shape Reconstruction Via 3D Head Tracking for Motion Capture in Daily Living Environment, pp. 3601-3607.

    Murasaki, Kazuhiko (The Univ. of Tokyo), Shimosaka, Masamichi (Univ. of Tokyo), Mori, Taketoshi (The Univ. of Tokyo), Sato, Tomomasa (The Univ. of Tokyo)

16:45-16:50	WeDT7.4

Cooperative Active Target Tracking for Heterogeneous Robots with Application to Gait Monitoring, pp. 3608-3613.

Morbidi, Fabio (Univ. of Texas at Arlington), Christopher, Ray (Univ. of Texas at Arlington), Mariottini, Gian Luca (Univ. of Texas at Arlington)

16:50-16:55	WeDT7.5

Fast Visual People Tracking Using a Feature-Based People Detector, pp. 3614-3619. Attachment

Königs, Achim (Fraunhofer Inst. for Communication, InformationProcessing, a), Schulz, Dirk (FKIE)

16:55-17:00	WeDT7.6

A Nonlinear Controller for People Guidance Based on Omnidirectional Vision, pp. 3620-3625.

Pereira, Flávio Garcia (Univ. Federal do Espírito Santo / Federal Univ. of E), Santos, Milton César Paes (Federal Univ. of Espírito Santo), Vassallo, Raquel Frizera (UFES)

17:00-17:15	WeDT7.7

Particle Filter Based Monocular Human Tracking with a 3D Cardbox Model and a Novel Deterministic Resampling Strategy, pp. 3626-3631.

Liu, Ziyuan (Inst. of Automatic Control Engineering, Tech.), Lee, Dongheui (Tech. Univ. of Munich), Sepp, Wolfgang (German Aerospace Center (DLR))

17:15-17:30	WeDT7.8

Non-Drifting Limb Angle Measurement Relative to the Gravitational Vector During Dynamic Motions Using Accelerometers and Rate Gyros, pp. 3632-3637.

Petruska, Andrew (Univ. of Utah), Meek, Sanford (Univ. of Utah)

WeDT8	Continental Parlor 8
Multirobot Coordination & Modular Robots (Regular Session)	
Chair: Stoy, Kasper	Univ. of Southern Denmark
Co-Chair: Smith, Stephen L.	Univ. of Waterloo

16:00-16:15	WeDT8.1

Modeling Mutual Capabilities in Heterogeneous Teams for Role Assignment, pp. 3638-3644.

Liemhetcharat, Somchaya (Carnegie Mellon Univ.), Veloso, Manuela (Carnegie Mellon Univ.)

16:15-16:30	WeDT8.2

Collision Avoidance for Persistent Monitoring in Multi-Robot Systems with Intersecting Trajectories, pp. 3645-3652. Attachment

Soltero, Daniel E. (Massachusetts Inst. of Tech.), Smith, Stephen L. (Univ. of Waterloo), Rus, Daniela (MIT)

16:30-16:45	WeDT8.3

Evaluation of a Power Management System for Heterogeneous Modules in Self-Reconfigurable Multi-Module Systems, pp. 3653-3658.

Wang, Zhuowei (DFKI Robotics Innovation Center Bremen), Cordes, Florian (DFKI Robotics Innovation Center Bremen), Dettmann, Alexander (DFKI Robotics Innovation Center Bremen), Szczuka, Roman (DFKI Robotics Innovation Center Bremen)

16:45-16:50	WeDT8.4

Generalized Programming of Modular Robots through Kinematic Configurations, pp. 3659-3666.

Bordignon, Mirko (Univ. of Southern Denmark), Stoy, Kasper (Univ. of Southern Denmark), Schultz, Ulrik Pagh (Univ. of Southern Denmark)

16:50-16:55	WeDT8.5

Energy-Aware Coverage Control with Docking for Robot Teams, pp. 3667-3672.

Derenick, Jason (Univ. of Pennsylvania), Michael, Nathan (Univ. of Pennsylvania), Kumar, Vijay (Univ. of Pennsylvania)

16:55-17:00	WeDT8.6

Optimization of Personal Distribution for Evacuation Guidance Based on Vector Field, pp. 3673-3678. Attachment

Okada, Masafumi (Tokyo Inst. of Tech.), Ando, Teruhisa (Tokyo Inst. of Tech.)

17:00-17:15	WeDT8.7

Intent Inference and Strategic Escape in Multi-Robot Games with Physical Limitations and Uncertainty (I), pp. 3679-3685.

Valtazanos, Aris (Univ. of Edinburgh), Ramamoorthy, Subramanian (The Univ. of Edinburgh)

17:15-17:30	WeDT8.8

Optimisation Model and Exact Algorithm for Autonomous Straddle Carrier Scheduling at Automated Container Terminals, pp. 3686-3693.

Cai, Binghuang (Univ. of Tech. Sydney), Huang, Shoudong (Univ. of Tech. Sydney), Liu, Dikai (Facultyof Engineering and Information Tech.), Yuan, Shuai (Univ. of Tech. Sydney), Dissanayake, Gamini (Univ. of Tech. Sydney), Lau, Haye (Patrick Tech. & Systems), Pagac, Daniel (Patrick Tech. Systems)

WeDT9	Continental Parlor 9
Calibration & Identification (Regular Session)	
Chair: Metta, Giorgio	Istituto Italiano di Tecnologia (IIT)
Co-Chair: Kovecses, Jozsef	McGill Univ.

16:00-16:15	WeDT9.1

Skin Spatial Calibration Using Force/Torque Measurements, pp. 3694-3700.

Del Prete, Andrea (Italian Inst. of Tech.), Denei, Simone (Univ. of Genova), Natale, Lorenzo (Istutito Italiano di Tecnologia), Mastrogiovanni, Fulvio (Univ. of Genova, Italy), Nori, Francesco (ISTITUTO ITALIANO DI TECNOLOGIA), Cannata, Giorgio (Univ. of Genova), Metta, Giorgio (Istituto Italiano di Tecnologia (IIT))

16:15-16:30	WeDT9.2

Muscle Strength and Mass Distribution Identification Toward Subject-Specific Musculoskeletal Modeling, pp. 3701-3707.

Hayashibe, Mitsuhiro (INRIA), Venture, Gentiane (Tokyo Univ. of Agriculture and Tech.), Ayusawa, Ko (Univ. of Tokyo), Nakamura, Yoshihiko (Univ. of Tokyo)

16:30-16:45	WeDT9.3

Static Calibration of the DLR Medical Robot MIRO, a Flexible Lightweight Robot with Integrated Torque Sensors, pp. 3708-3715.

Klodmann, Julian (German Aerospace Center), Konietschke, Rainer (DLR (German Aerospace Center)), Albu-Schäffer, Alin (DLR - German Aerospace Center), Hirzinger, Gerd (German Aerospace Center (DLR))

16:45-16:50	WeDT9.4

Simultaneous Calibration, Localization, and Mapping, pp. 3716-3721.

Kuemmerle, Rainer (Univ. of Freiburg), Grisetti, Giorgio (Sapienza Univ. of Rome), Burgard, Wolfram (Univ. of Freiburg)

16:50-16:55	WeDT9.5

Experimental Evaluation of New Methods for In-Situ Calibration of Attitude and Doppler Sensors for Underwater Vehicle Navigation, pp. 3722-3727.

Troni, Giancarlo (Johns Hopkins Univ.), Whitcomb, Louis (The Johns Hopkins Univ.)

16:55-17:00	WeDT9.6

New Method for Global Identification of the Joint Drive Gains of Robots Using a Known Payload Mass, pp. 3728-3733.

Gautier, Maxime (Univ. of Nantes), Briot, Sébastien (IRCCyN)

17:00-17:15	WeDT9.7

Relative Accuracy Enhancement System Based on Internal Error Range Estimation for External Force Measurement in Construction Manipulator, pp. 3734-3739.

Kamezaki, Mitsuhiro (Waseda Univ.), Iwata, Hiroyasu (Waseda Univ.), Sugano, Shigeki (Waseda Univ.)

17:15-17:30	WeDT9.8

Recursive State-Parameter Estimation of Haptic Robotic Systems, pp. 3740-3745.

Mohtat, Arash (McGill Univ.), Ghaffari Toiserkan, Kamran (McGill Univ.), Kovecses, Jozsef (McGill Univ.)

WeDPT10	Golden Gate Room
Interactive VIII (Interactive Session)	

16:00-17:30	WeDPT10.1

Adapting Robot Team Behavior from Interaction with a Group of People*.

Urcola, Pablo (Inst. de Investigación en Ingeniería de Aragón, Univ. de Zaragoza), Montano, Luis (Univ. de Zaragoza)

16:00-17:30	WeDPT10.2

Towards a Platform-Independent Cooperative Human-Robot Interaction System: II. Perception, Execution and Imitation of Goal Directed Actions*.

Lallée, Stéphane (INSERM Stem Cell & Brain Res. Inst.), Pattacini, Ugo (Istituto Italiano di Tecnologia (IIT)), Boucher, Jean-David (INSERM Stem Cell & Brain Res. Inst.), Lemaignan, Séverin (CNRS - LAAS), Lenz, Alexander (Bristol Robotic Lab.), Melhuish, Chris (Bristol Robotic Lab.), Natale, Lorenzo (Istituto Italiano di Tecnologia (IIT)), Skachek, Sergey (Bristol Robotic Lab.), Hamann, Katharina (Max Planck Inst. for Evolutionary Anthropology), Steinwender, Jasmin (Max Planck Inst. for Evolutionary Anthropology), Sisbot, Emrah Akin (CNRS - LAAS), Metta, Giorgio (Istituto Italiano di Tecnologia (IIT)), Alami, Rachid (CNRS - LAAS), Warnier, Matthieu (CNRS - LAAS), Guitton, Julien (CNRS - LAAS), Warneken, Felix (Harvard Univ.), Dominey, Peter Ford (INSERM Stem Cell & Brain Res. Inst.)

16:00-17:30	WeDPT10.3

Listening for People: Exploiting the Spectral Structure of Speech to Robustly Perceive the Presence of People*.

Hilsenbeck, Barbara (Karlsruhe Univ. of Applied Sciences), Kirchner, Nathan (Univ. of Tech.)

16:00-17:30	WeDPT10.4

Outlet Detection and Pose Estimation for Robot Continuous Operation*.

Eruhimov, Victor (Itseez), Meeussen, Wim (Willow Garage inc.)

16:00-17:30	WeDPT10.5

Robust Tracking of Human Hand Postures for Robot Teaching*.

Maycock, Jonathan (Bielefeld Univ.), Steffen, Jan (Bielefeld Univ.), Haschke, Robert (Bielefeld Univ.), Ritter, Helge Joachim (Bielefeld Univ.)

16:00-17:30	WeDPT10.6

Visual Tracking Using the Sum of Conditional Variance*.

Richa, Rogerio (Johns Hopkins Univ.), Sznitman, Raphael (Johns Hopkins Univ.), Taylor, Russell H. (The Johns Hopkins Univ.), Hager, Gregory (Johns Hopkins Univ.)

16:00-17:30	WeDPT10.7

Capacitive Skin Sensors for Robot Impact Monitoring*.

Phan, Samson (Stanford Univ.), Quek, Zhan Fan (Stanford Univ.), Shah, Preyas (Stanford Univ.), Shin, Dongjun (Stanford Univ.), Ahmed, Zubair (Stanford Univ.), Khatib, Oussama (Stanford Univ.), Cutkosky, Mark (Stanford Univ.)

16:00-17:30	WeDPT10.8

Instantaneous Stiffness Effects on Impact Forces in Human-Friendly Robots*.

Shin, Dongjun (Stanford Univ.), Phan, Samson (Stanford Univ.), Quek, Zhan Fan (Stanford Univ.), Cutkosky, Mark (Stanford Univ.), Khatib, Oussama (Stanford Univ.)

16:00-17:30	WeDPT10.9

Fast Computation of Wheel-Soil Interactions for Safe and Efficient Operation of Mobile Robots*.

Jia, Zhenzhong (Univ. of Michigan), Smith, William (Univ. of Michigan), Peng, Huei (Univ. of MIchigan)

16:00-17:30	WeDPT10.10

Bilateral Physical Interaction with a Robot Manipulator through a Weighted Combination of Flow Fields*.

Pistillo, Antonio (Istituto Italiano di Tecnologia), Calinon, Sylvain (Istituto Italiano di Tecnologia), Caldwell, Darwin G. (Italian Inst. of Tech.)

16:00-17:30	WeDPT10.11

Motion Control of a Semi-Mobile Haptic Interface for Extended Range Telepresence*.

Pérez Arias, Antonia (Karlsruhe Inst. of Tech. (KIT)), Hanebeck, Uwe D. (Karlsruhe Inst. of Tech. (KIT))

16:00-17:30	WeDPT10.12

An Objective Index That Substitutes for Subjective Quality of Vibrotactile Material-Like Textures*.

Okamoto, Shogo (Nagoya Univ.), Yamada, Yoji (Nagoya Univ.)

16:00-17:30	WeDPT10.13

Minimalist Multiple Target Tracking Using Directional Sensor Beams (I)*.

Bobadilla, Leonardo (Univ. of Illinois), Sanchez Plazas, Oscar (Univ. of Illinois at Urbana-Champaign), Czarnowski, Justin (Univ. of Illinois at Urbana-Champaign), LaValle, Steven M (Univ. of Illinois)

16:00-17:30	WeDPT10.14

Temporal Logic Control in Dynamic Environments with Probabilistic Satisfaction Guarantees*.

Medina Ayala, Ana Ivonne (Boston Univ.), Andersson, Sean (Boston Univ.), Belta, Calin (Boston Univ.)

16:00-17:30	WeDPT10.15

Computing Unions of Inevitable Collision States and Increasing Safety to Unexpected Obstacles*.

Althoff, Daniel (Tech. Univ. München), Brand, Christoph Norbert (Tech. Univ. München), Wollherr, Dirk (Tech. Univ. München), Buss, Martin (Tech. Univ. München)

16:00-17:30	WeDPT10.16

Current-Sensitive Path Planning for an Underactuated Free-Floating Ocean Sensorweb (I)*.

Dahl, Kristen (California Inst. of Tech.), Thompson, David (JPL/ California Inst. of Tech.), McLaren, David (JPL/ California Inst. of Tech.), Chao, Yi (California Inst. of Tech.), Chien, Steve (Jet Propulsion Lab.)

16:00-17:30	WeDPT10.17

Toward Risk Aware Mission Planning for Autonomous Underwater Vehicles (I)*.

de Menezes Pereira, Arvind A. (Univ. of Southern California), Binney, Jonathan (Univ. of Southern California), Jones, Burton (Univ. of Southern California), Ragan, Matthew (Univ. of Southern California), Sukhatme, Gaurav (Univ. of Southern California)

16:00-17:30	WeDPT10.18

AUV Docking on a Moving Submarine Using a K-R Navigation Function*.

Sujit, P.B. (Univ. of Porto), Healey, Anthony J. (Naval Postgraduate School), Sousa, João (Univ. Porto - Faculdade Engenharia)

16:00-17:30	WeDPT10.19

Adaptive Predictive Gaze Control of a Redundant Humanoid Robot Head.

Milighetti, Giulio (Fraunhofer-Inst. of Optronics, System Tech. and Image Exploitation IOSB), Vallone, Luca (DIS, Univ. di Roma "La Sapienza"), De Luca, Alessandro (Univ. di Roma "La Sapienza")

16:00-17:30	WeDPT10.20

Dynamic Whole-Body Mobile Manipulation with a Torque Controlled Humanoid Robot Via Impedance Control Laws.

Dietrich, Alexander (German Aerospace Center (DLR)), Wimboeck, Thomas (German Aerospace Center (DLR)), Albu-Schäffer, Alin (DLR - German Aerospace Center)

16:00-17:30	WeDPT10.21

Gait Pattern Generation and Stabilization for Humanoid Robot Based on Coupled Oscillators.

Ha, Inyong (The Univ. of Tokyo), Tamura, Yusuke (The Univ. of Tokyo), Asama, Hajime (The Univ. of Tokyo)

16:00-17:30	WeDPT10.22

Localization Using Ambiguous Bearings from Radio Signal Strength (I).

Derenick, Jason (Univ. of Pennsylvania), Fink, Jonathan (Univ. of Pennsylvania), Kumar, Vijay (Univ. of Pennsylvania)

16:00-17:30	WeDPT10.23

Planning for Multi-Robot Exploration with Multiple Objective Utility Functions.

Butzke, Jonathan (Carnegie Mellon Univ.), Likhachev, Maxim (Carnegie Mellon Univ.)

16:00-17:30	WeDPT10.24

M: A Complete Multirobot Path Planning Algorithm with Performance Bounds*.

Wagner, Glenn (Carnegie Mellon), Choset, Howie (Carnegie Mellon Univ.)

16:00-17:30	WeDPT10.25

Rapid Development of Manifold-Based Graph Optimization Systems for Multi-Sensor Calibration and SLAM.

Wagner, René (Deutsches Forschungszentrum für Künstliche Intelligenz GmbH), Birbach, Oliver (DFKI), Frese, Udo (Univ. Bremen)

16:00-17:30	WeDPT10.26

Two-Phase Online Calibration for Infrared-Based Inter-Robot Positioning Modules.

Gowal, Sven (EPFL), Prorok, Amanda (EPFL), Martinoli, Alcherio (EPFL)

16:00-17:30	WeDPT10.27

Self Calibration of a Vision System Embedded in a Visual SLAM Framework.

Joly, Cyril (INRIA Sophia Antipolis Méditerannée), Rives, Patrick (INRIA)

Technical Program for Thursday September 29, 2011

ThAT1	Continental Parlor 1

Force and Stiffness Control (Regular Session)

Chair: Webster III, Robert James	Vanderbilt Univ.
Co-Chair: Hurst, Jonathan	Oregon State Univ.

08:00-08:15	ThAT1.1

A Trajectory Tracking Controller with Dynamic Gains for Mobile Robots, pp. 3746-3751.

Resende, Cassius (Federal Inst. for Education, Science and Tech. of Esp´&), Espinosa, Felipe (Univ. of Alcalá), Bravo, Ignacio (Univ. of Alcalá), Sarcinelli-Filho, Mario (Federal Univ. of Espirito Santo), Bastos-Filho, Teodiano (Federal Univ. of Espirito Santo)

08:15-08:30	ThAT1.2

Multi-Priority Control in Redundant Robotic Systems, pp. 3752-3757.

Sadeghian, Hamid (DIS), Villani, Luigi (Univ. di Napoli Federico II), Keshmiri, Mehdi (Isfahan Univ. of Tech.), Siciliano, Bruno (Univ. Napoli Federico II)

08:30-08:45	ThAT1.3

Force Control for Planar Spring-Mass Running, pp. 3758-3763.

Koepl, Devin (Oregon State Univ.), Hurst, Jonathan (Oregon State Univ.)

08:45-08:50	ThAT1.4

Deflection-Based Force Sensing for Continuum Robots: A Probabilistic Approach, pp. 3764-3769. Attachment

Rucker, Caleb (Vanderbilt Univ.), Webster III, Robert James (Vanderbilt Univ.)

08:50-08:55	ThAT1.5

Optimality Principles in Stiffness Control: The VSA Hammer, pp. 3770-3775.

Garabini, Manolo (Centro interdipartimentale di Ricerca E. Piaggio - Univ. di), Belo, Felipe (Univ. of Pisa), Passaglia, Andrea (Univ. di Pisa), Salaris, Paolo (Univ. of Pisa), Bicchi, Antonio (Univ. of Pisa)

08:55-09:00	ThAT1.6

A Novel Stiffness Node Controller Which Enables Simultaneous Regulation of Torque and Stiffness in Multi-Muscle Driven Joints, pp. 3776-3783.

Annunziata, Salvatore (Univ. of Bielefeld), Paskarbeit, Jan (Univ. of Bielefeld), Schneider, Axel (Univ. of Bielefeld)

09:00-09:15	ThAT1.7

Optimal and Fault-Tolerant Torque Control of Servo Motors Subject to Voltage and Current Limits, pp. 3784-3791.

Aghili, Farhad (Canadian Space Agency)

09:15-09:30	ThAT1.8

Online Motion Selection for Semi-Optimal Stabilization Using Reverse-Time Tree, pp. 3792-3799. Attachment

Kim, Chyon Hae (Honda Res. Inst. Japan Co.,Ltd.), Tsujino, Hiroshi (Honda Res. Inst. Co., Ltd.), Sugano, Shigeki (Waseda Univ.)

ThAT2	Continental Parlor 2

Range and RGB-D Sensing (Regular Session)

Chair: Zlot, Robert	CSIRO
Co-Chair: Arras, Kai Oliver	Univ. of Freiburg

08:00-08:15	ThAT2.1

3D Object Recognition in Range Images Using Visibility Context, pp. 3800-3807. Attachment

Kim, Eunyoung (Univ. of Southern California), Medioni, Gerard (Univ. of Southern California)

08:15-08:30	ThAT2.2

Fast Plane Extraction in 3D Range Data Based on Line Segments, pp. 3808-3815.

Georgiev, Kristiyan (Temple Univ.), Creed, Ross (Temple Univ.), Lakaemper, Rolf (Temple Univ.)

08:30-08:45	ThAT2.3

Comparative Evaluation of Range Sensing Technologies for Underground Void Modeling, pp. 3816-3823.

Wong, Uland (Carnegie Mellon Univ.), Morris, Aaron (Carnegie Mellon Univ.), Lea, Colin (SUNY at Buffalo), Lee, James (Carnegie Mellon Univ.), Whittaker, Chuck (Carnegie Mellon Univ.), Garney, Ben (Univ. of Oregon), Whittaker, William (Carnegie Mellon Univ.)

08:45-08:50	ThAT2.4

Tracking a Depth Camera: Parameter Exploration for Fast ICP, pp. 3824-3829.

Pomerleau, Francois (ETH Zurich), Magnenat, Stéphane (EPFL), Colas, Francis (ETH Zürich), Liu, Ming (ETH Zurich), Siegwart, Roland (ETH Zurich)

08:50-08:55	ThAT2.5

Watertight Surface Reconstruction of Caves from 3D Laser Data, pp. 3830-3837.

Holenstein, Claude (CSIRO), Zlot, Robert (CSIRO), Bosse, Michael (CSIRO ICT Centre)

08:55-09:00	ThAT2.6

People Detection in RGB-D Data, pp. 3838-3843.

Spinello, Luciano (Univ. of Freiburg), Arras, Kai Oliver (Univ. of Freiburg)

09:00-09:15	ThAT2.7

People Tracking in RGB-D Data with Online-Boosted Target Models, pp. 3844-3849.

Luber, Matthias (Univ. of Freiburg), Spinello, Luciano (Albert-Ludwigs-Univ. Freiburg), Arras, Kai Oliver (Univ. of Freiburg)

09:15-09:30	ThAT2.8

'Misspelled' Visual Words in Unsupervised Range Data Classification: The Effect of Noise on Classification Performance, pp. 3850-3855.

Firman, Michael David (Univ. Coll. London), Julier, Simon Justin (Univ. Coll. London)

ThAT3	Continental Parlor 3

Discrete & Kinodynamic Planning (Regular Session)

Chair: Olson, Edwin	Univ. of Michigan
Co-Chair: Biagiotti, Luigi	Univ. of Modena and Reggio Emilia

08:00-08:15	ThAT3.1

Improved Hierarchical Planner Performance Using Local Path Equivalence, pp. 3856-3861.

Knepper, Ross A (Carnegie Mellon Univ.), Mason, Matthew T. (Carnegie Mellon Univ.)

08:15-08:30	ThAT3.2

Simplicial Dijkstra and a* Algorithms for Optimal Feedback Planning, pp. 3862-3867.

Yershov, Dmitry (Univ. of Illinois at Urbana-Champaign), LaValle, Steven M (Univ. of Illinois)

08:30-08:45	ThAT3.3

Choosing Landmarks for Risky Planning, pp. 3868-3873.

Murphy, Elizabeth (Queensland Univ. of Tech.), Corke, Peter

(QUT), Newman, Paul (Oxford Univ.)

08:45-08:50	ThAT3.4

A Graph Traversal Based Algorithm for Obstacle Detection Using Lidar or Stereo, pp. 3874-3880.

Kuthirummal, Sujit (SRI International Sarnoff), Das, Aveek (SRI International Sarnoff), Samarasekera, Supun (Sarnoff)

08:50-08:55	ThAT3.5

Iterative Path Optimization for Practical Robot Planning, pp. 3881-3886.

Richardson, Andrew (Univ. of Michigan), Olson, Edwin (Univ. of Michigan)

08:55-09:00	ThAT3.6

Analysis of the Discontinuities in Prioritized Tasks-Space Control under Discreet Task Scheduling Operations, pp. 3887-3892.

Keith, François (INRIA Rhône-Alpes), Wieber, Pierre-Brice (INRIA Rhône-Alpes), Mansard, Nicolas (CNRS), Kheddar, Abderrahmane (CNRS)

09:00-09:15	ThAT3.7

Geometric Maneuverability, with Applications to Low Reynolds Number Swimming, pp. 3893-3898.

Hatton, Ross (Carnegie Mellon Univ.), Burton, Lisa (Massachusetts Inst. of Tech.), Hosoi, Anette (MIT), Choset, Howie (Carnegie Mellon Univ.)

09:15-09:30	ThAT3.8

Input Shaping Via B-Spline Filters for 3-D Trajectory Planning, pp. 3899-3904.

Biagiotti, Luigi (Univ. of Modena and Reggio Emilia), Melchiorri, Claudio (Univ. of Bologna)

ThAT4	Continental Ballroom 4

Symposium: Stochasticity in Robotics and Biological Systems I (Invited Session)

Chair: Hsieh, M. Ani	Drexel Univ.
Co-Chair: Asada, Harry	MIT
Organizer: Hsieh, M. Ani	Drexel Univ.
Organizer: Asada, Harry	MIT
Organizer: Chirikjian, Gregory	Johns Hopkins Univ.

08:00-08:15	ThAT4.1

Semi-Plenary Invited Talk: Set-Based Control in Stochastic Dynamical Systems: Making Almost Invariant Sets More Invariant.

Schwartz, Ira (US Naval Res. Lab.)

08:30-08:45	ThAT4.3

Noise, Bifurcations, and Modeling of Interacting Particle Systems (I), pp. 3905-3910. Attachment

Mier-Y-Teran-Romero, Luis (US Naval Res. Lab.), Forgoston, Eric (Montclair State Univ.), Schwartz, Ira (US Naval Res. Lab.)

08:45-08:50	ThAT4.4

Probability of Success in Stochastic Robot Navigation with State Feedback (I), pp. 3911-3916.

Shah, Shridhar (Univ. of Delaware), Pahlajani, Chetan (Univ. of Delaware), Tanner, Herbert G. (Univ. of Delaware)

08:50-08:55	ThAT4.5

A Stochastic Approach to Dubins Feedback Control for Target Tracking (I), pp. 3917-3922.

Anderson, Ross (Univ. of California, Santa Cruz), Milutinovic, Dejan (Baskin School of Engineering, UC Santa Cruz)

08:55-09:00	ThAT4.6

Optimization of Stochastic Strategies for Spatially Inhomogeneous

Robot Swarms: A Case Study in Commercial Pollination (I), pp. 3923-3930.

Berman, Spring (Harvard Univ.), Nagpal, Radhika (Harvard Univ.), Halasz, Adam (West Virginia Univ.)

09:00-09:15	ThAT4.7

Stochastic Tracking of Migrating Live Cells Interacting with 3D Gel Environment Using Augmented-Space Particle Filters (I), pp. 3931-3936.

Ong, Lee-Ling Sharon (Singapore-MIT Alliance for Res. and Tech.), Wood, Levi (Massachusetts Inst. of Tech.), Ang Jr, Marcelo H (National Univ. of Singapore), Asada, Harry (MIT)

09:15-09:30	ThAT4.8

Stochastic Dynamics of Bacteria Propelled Spherical Micro-Robots (I), pp. 3937-3942.

Arabagi, Veaceslav (Carnegie Mellon Univ.), Behkam, Bahareh (Virginia Tech.), Sitti, Metin (Carnegie Mellon Univ.)

ThAT5	Continental Ballroom 5

Symposium: Humanoid Robotics and Biped Locomotion (Invited Session)

Chair: Goswami, Ambarish	Honda Res. Inst.
Co-Chair: Yun, Seung-kook	Honda Res. Inst.
Organizer: Goswami, Ambarish	Honda Res. Inst.
Organizer: Yun, Seung-kook	Honda Res. Inst.

08:00-08:15	ThAT5.1

Semi-Plenary Invited Talk: Angular Momentum-Based Humanoid Robot Control*.

Kajita, Shuuji (National Inst. of AIST)

08:30-08:45	ThAT5.3

Momentum-Based Reactive Stepping Controller on Level and Non-Level Ground for Humanoid Robot Push Recovery (I), pp. 3943-3950. Attachment

Yun, Seung-kook (Honda Res. Inst.), Goswami, Ambarish (Honda Res. Inst.)

08:45-08:50	ThAT5.4

Time-Independent, Spatial Human Coordination for Humanoids, pp. 3951-3956. Attachment

Palyart Lamarche, Jean Christophe (The Italian Inst. of Tech. (IIT)), Bruneau, Olivier (UVSQ / LISV), Fontaine, Jean-Guy (Italian Inst. of Tech.)

08:50-08:55	ThAT5.5

The Effect of Swing Leg Retraction on Running Energy Efficiency, pp. 3957-3962.

Haberland, Matt (Massachusetts Inst. of Tech.), Karssen, Daniël (Delft Univ. of Tech.), Kim, Sangbae (Massachusetts Inst. of Tech.), Wisse, Martijn (Delft Univ. of Tech.)

08:55-09:00	ThAT5.6

Practical Bipedal Walking Control on Uneven Terrain Using Surface Learning and Push Recovery, pp. 3963-3968. Attachment

Yi, Seung Joon (Univ. of Pennsylvania), Zhang, Byoung-Tak (Seoul National Univ.), Hong, Dennis (Virginia Tech.), Lee, Daniel D. (Univ. of Pennsylvania)

09:00-09:15	ThAT5.7

Angular Momentum: Insights into Walking and Its Control (I), pp. 3969-3974.

Bennett, Bradford (Univ. of Virginia), Russell, Shawn (Univ. of Virginia), Robert, Thomas (Univ. de Lyon - IFSTTAR)

09:15-09:30	ThAT5.8

XoR: Hybrid Drive Exoskeleton Robot That Can Balance, pp. 3975-3981. Attachment

Hyon, Sang-Ho (Ritsumeikan Univ.), Morimoto, Jun (ATR Computational Neuroscience Lab.), Matsubara, Takamitsu (NAIST/ATR), Noda, Tomoyuki (ATR Computational Neuroscience Lab.), Kawato, Mitsuo (ATR)

ThAT6	Continental Ballroom 6
Symposium: Robots That Can See I (Invited Session)	
Chair: Neira, José	Univ. de Zaragoza
Co-Chair: Fox, Dieter	Univ. of Washington
Organizer: Neira, José	Univ. de Zaragoza
Organizer: Newman, Paul	Oxford Univ.

08:00-08:15   ThAT6.1

Semi-Plenary Invited Talk: Vision at Nanoscales*.

Sun, Yu (Univ. of Toronto)

08:30-08:45   ThAT6.3

Visual Place Categorization in Maps, pp. 3982-3989. Attachment

Ranganathan, Ananth (Honda Res. Inst. USA), Lim, Jongwoo (Google Inc.)

08:45-08:50   ThAT6.4

CD SLAM - Continuous Localization and Mapping in a Dynamic World, pp. 3990-3997. Attachment

Pirker, Katrin (Graz Univ. of Tech.), Rüther, Matthias (Graz Univ. of Tech.), Bischof, Horst (Graz Univ. of Tech.)

08:50-08:55   ThAT6.5

Vision-Based Mobile Robot's SLAM and Navigation in Crowded Environments, pp. 3998-4005. Attachment

Morioka, Hiroshi (Tokyo Inst. of Tech.), Sangkyu, Yi (Tokyo Inst. of Tech.), Hasegawa, Osamu (Tokyo Inst. of Tech.)

08:55-09:00   ThAT6.6

Vision Based Attitude and Altitude Estimation for UAVs in Dark Environments, pp. 4006-4011.

Natraj, Ashutosh (Univ. de Picardie, Jules Verne, Amiens, France), Demonceaux, Cédric (Univ. of Burgundy), Vasseur, Pascal (Univ. de Rouen), Sturm, Peter (INRIA Rhone Alpes)

09:00-09:15   ThAT6.7

Real-Time Photo-Realistic 3D Mapping for Micro Aerial Vehicles, pp. 4012-4019. Attachment

Heng, Lionel (ETH Zurich), Lee, Gim Hee (ETH Zurich), Fraundorfer, Friedrich (ETH Zurich), Pollefeys, Marc (ETH Zurich)

09:15-09:30   ThAT6.8

Stereo Visual Odometry for Pipe Mapping, pp. 4020-4025.

Hansen, Peter (Carnegie Mellon Univ. in Qatar), Alismail, Hatem (Carnegie Mellon Univ.), Browning, Brett (Carnegie Mellon Univ.), Rander, Peter (Carnegie Mellon Univ.)

ThAT7	Continental Parlor 7
Mechanisms: Joint Design (Regular Session)	
Chair: Sardellitti, Irene	Italian Inst. of Tech.
Co-Chair: Brethe, Jean-François	LE HAVRE Univ.

08:00-08:15   ThAT7.1

Robust Estimation of Variable Stiffness in Flexible Joints, pp. 4026-4033.

Flacco, Fabrizio (Univ. di Roma "La Sapienza"), De Luca, Alessandro (Univ. di Roma "La Sapienza"), Sardellitti, Irene (Italian Inst. of Tech.), Tsagarakis, Nikolaos (Italian Inst. of Tech. (IIT))

08:15-08:30   ThAT7.2

Cartesian Stiffness Matrix of Manipulators with Passive Joints: Analytical Approach, pp. 4034-4041.

Pashkevich, Anatol (Ec. des Mines de Nantes), Klimchik, Alexandr (Ec. des Mines de Nantes), Caro, Stéphane (CNRS), Chablat, Damien (Inst. de Recherche en Communications et Cybernétique de Nante)

08:30-08:45   ThAT7.3

A Bio-Inspired Condylar Hinge Joint for Mobile Robots, pp. 4042-4047.

Etoundi, Appolinaire C. (Univ. of Bristol), Vaidyanathan, Ravi (Imperial Coll. London), Burgess, Stuart (Univ. of Bristol)

08:45-08:50   ThAT7.4

The Mechanism of the Linear Load-Sensitive Continuously Variable Transmission with the Spherical Driving Unit, pp. 4048-4053. Attachment

Tadakuma, Kenjiro (Osaka Univ.), Tadakuma, Riichiro (Yamagata Univ.), Terada, Kazuki (the Univ. of Electro-Communications), Higashimori, Mitsuru (Osaka Univ.), Kaneko, Makoto (Osaka Univ.), Ming, Aiguo (The Univ. of Electro-Communications), Shimojo, Makoto (Univ. of Electro-COmmunications)

08:50-08:55   ThAT7.5

Dynamic Model of a Hyper-Redundant, Octopus-Like Manipulator for Underwater Applications, pp. 4054-4059. Attachment

Kang, Rongjie (Italian Inst. of Tech. (IIT)), Kazakidi, Asimina (Foundation for Res. & Tech. - Hellas (FORTH)), Guglielmino, Emanuele (Italian Inst. of Tech.), Branson, David (Istituto Italiano di Tecnologia (IIT)), Tsakiris, Dimitris (FORTH), Ekaterinaris, John A. (Inst. of Applied and Computational Mathematics, Foundation f), Caldwell, Darwin G. (Italian Inst. of Tech.)

08:55-09:00   ThAT7.6

Three Module Lumped Element Model of a Continuum Arm Section, pp. 4060-4065.

Giri, Nivedhitha (Clemson Univ.), Walker, Ian (Clemson Univ.)

09:00-09:15   ThAT7.7

Granular Stochastic Modeling of Robot Micrometric Precision, pp. 4066-4071.

Brethe, Jean-François (LE HAVRE Univ.)

ThAT8	Continental Parlor 8
Autonomous Vehicles (Regular Session)	
Chair: Iagnemma, Karl	MIT
Co-Chair: Smart, William	Washington Univ. in St. Louis

08:00-08:15   ThAT8.1

Avoiding Steering Actuator Saturation in Off-Road Mobile Robot Path Tracking Via Predictive Velocity Control, pp. 4072-4077.

Hach, Oliver (Cemagref - Centre de Clermont-Ferrand), Lenain, Roland (Cemagref), Thuilot, Benoit (Clermont-Ferrand Univ.), Martinet, Philippe (Blaise Pascal Univ.)

08:15-08:30   ThAT8.2

Consistent Pile-Shape Quantification for Autonomous Wheel Loaders, pp. 4078-4083.

Magnusson, Martin (Örebro Univ.), Almqvist, Håkan (Learning Systems Lab. Center for Applied Autonomous Sensor Syste)

08:30-08:45   ThAT8.3

Integrating Stereo Structure for Omnidirectional Trail Following, pp. 4084-4090.

Rasmussen, Christopher (Univ. of Delaware), Lu, Yan (Univ. of Delaware), Kocamaz, Mehmet (Univ. of Delaware)

08:45-08:50	ThAT8.4

Performance Analysis and Odometry Improvement of an Omnidirectional Mobile Robot for Outdoor Terrain, pp. 4091-4096. Attachment

Ishigami, Genya (Japan Aerospace Exploration Agency (JAXA)), Pineda, Elvine Philip (Massachusetts Inst. of Tech.), Overholt, Jim (US Army), Hudas, Greg (US Army RDECOM-TARDEC), Iagnemma, Karl (MIT)

08:50-08:55	ThAT8.5

Inertial Rotation Center Position Estimation for a Perching Treaded Vehicle, pp. 4097-4102. Attachment

Schmidt-Wetekam, Christopher (Univ. of California San Diego), Morozovsky, Nicholas (Univ. of California San Diego), Bewley, Thomas (Flow Control & Coordinated Robotics Lab.)

08:55-09:00	ThAT8.6

Improving Near-To-Near Lateral Control of Platoons without Communication, pp. 4103-4108.

Yazbeck, Jano (Nancy 1 Univ. / LORIA), Scheuer, Alexis (Nancy 1 Univ. / LORIA), Simonin, Olivier (LORIA), Charpillet, Francois (INRIA, Loria)

09:00-09:15	ThAT8.7

An Automated Truck Platoon for Energy Saving (I), pp. 4109-4114.

Tsugawa, Sadayuki (Meijo Univ.), Kato, Shin (National Inst. of AIST), Aoki, Keiji (Japan Automobile Res. Inst.)

09:15-09:30	ThAT8.8

Context-Aware Video Compression for Mobile Robots, pp. 4115-4120.

Lazewatsky, Daniel (Washington Univ. in St. Louis), Giertler, Bogumil (Colby Coll.), Witick, Martha (Colby Coll.), Perlmutter, Leah (Colby Coll.), Maxwell, Bruce (Colby Coll.), Smart, William (Washington Univ. in St. Louis)

ThAT9	Continental Parlor 9
Towards Anthropomimetic Robots (Regular Session)	
Chair: Beetz, Michael	Tech. Univ. München
Co-Chair: Kirchner, Frank	Univ. of Bremen

08:00-08:15	ThAT9.1

A Model of Reference Trajectory Adaptation for Interaction with Objects of Arbitrary Shape and Impedance, pp. 4121-4126.

Yang, Chenguang (Univ. of Plymouth), Burdet, Etienne (imperial Coll. london)

08:15-08:30	ThAT9.2

Generic Dynamic Motion Generation with Multiple Unilateral Constraints, pp. 4127-4133.

Saab, Layale (LAAS-CNRS), Ramos, Oscar (LAAS-CNRS), Mansard, Nicolas (CNRS), Soueres, Philippe (LAAS-CNRS), Fourquet, Jean-Yves (ENIT)

08:30-08:45	ThAT9.3

Predictive Compliance for Interaction Control of Robot Manipulators, pp. 4134-4140. Attachment

de Gea Fernandez, Jose (DFKI), Kirchner, Frank (Univ. of Bremen)

08:45-08:50	ThAT9.4

Parameterizing Actions to Have the Appropriate Effects, pp. 4141-4147.

Mösenlechner, Lorenz (Tech. Univ. München), Beetz, Michael (Tech. Univ. München)

08:50-08:55	ThAT9.5

Physics-Based Modeling of an Anthropomimetic Robot, pp. 4148-4153.

Wittmeier, Steffen (Tech. Univ. of Munich), Jäntsch, Michael (Tech.

Univ. of Munich), Dalamagkidis, Konstantinos (TU Munich), Knoll, Alois (TU Munich)

08:55-09:00	ThAT9.6

Reexamining Lucas-Kanade Method for Real-Time Independent Motion Detection: Application to the Icub Humanoid Robot, pp. 4154-4160.

Ciliberto, Carlo (Italian Inst. of Tech.), Pattacini, Ugo (Istituto Italiano di Tecnologia), Natale, Lorenzo (Istutito Italiano di Tecnologia), Nori, Francesco (ISTITUTO ITALIANO DI TECNOLOGIA), Metta, Giorgio (Istituto Italiano di Tecnologia (IIT))

09:00-09:15	ThAT9.7

A Comparison between Joint Level Torque Sensing and Proximal F/T Sensor Torque Estimation: Implementation on the Icub, pp. 4161-4167.

Randazzo, Marco (ISTITUTO ITALIANO DI TECNOLOGIA), Fumagalli, Matteo (Univ. of Twente), Nori, Francesco (ISTITUTO ITALIANO DI TECNOLOGIA), Natale, Lorenzo (Istutito Italiano di Tecnologia), Metta, Giorgio (Istituto Italiano di Tecnologia (IIT)), Sandini, Giulio (ITALIAN Inst. OF Tech.)

09:15-09:30	ThAT9.8

Computation with Mechanically Coupled Springs for Compliant Robots, pp. 4168-4173.

Sumioka, Hidenobu (Univ. of Zurich), Hauser, Helmut (Univ. of Zurich), Pfeifer, Rolf (Univ. of Zurich)

ThAPT10	Golden Gate Room
Interactive IX (Interactive Session)	

08:00-09:30	ThAPT10.1

*Experimental Investigation of Human-Robot Cooperative Carrying**.

Parker, Chris (Univ. of British Columbia), Croft, Elizabeth (Univ. of British Columbia)

08:00-09:30	ThAPT10.2

*A Human-Centered Approach to Robot Gesture Based Communication within Collaborative Working Processes**.

Ende, Tobias (DLR (German Aerospace Center)), Haddadin, Sami (German Aerospace Center (DLR)), Parusel, Sven (German Aerospace Center), Wüsthoff, Tilo (DLR), Albu-Schäffer, Alin (DLR - German Aerospace Center)

08:00-09:30	ThAPT10.3

*Human Workflow Analysis Using 3D Occupancy Grid Hand Tracking in a Human-Robot Collaboration Scenario**.

Lenz, Claus (Tech. Univ. München), Sotzek, Alice (Tech. Univ. München), Röder, Thorsten (Tech. Univ. München), Radrich, Helmuth (Tech. Univ. München), Huber, Markus (LMU Munich), Glasauer, Stefan (Ludwig-Maximilian Univ.), Knoll, Alois (TU Munich)

08:00-09:30	ThAPT10.4

*Encoding the Time and Space Constraints of a Task in Explicit-Duration Hidden Markov Model**.

Calinon, Sylvain (Istituto Italiano di Tecnologia), Pistillo, Antonio (Istituto Italiano di Tecnologia), Caldwell, Darwin G. (Italian Inst. of Tech.)

08:00-09:30	ThAPT10.5

*Behavior Prediction from Trajectories in a House by Estimating Transition Model Using Stay Points**.

Mori, Taketoshi (The Univ. of Tokyo), Tominaga, Shoji (The Univ. of Tokyo), Noguchi, Hiroshi (The Univ. of Tokyo), Shimosaka, Masamichi (Univ. of Tokyo), Fukui, Rui (The Univ. of Tokyo), Sato, Tomomasa (The Univ. of Tokyo)

08:00-09:30	ThAPT10.6

*Estimation and Prediction of Multiple Flying Balls Using Probability

Hypothesis Density Filtering*.

    Birbach, Oliver (DFKI), Frese, Udo (Univ. Bremen)

08:00-09:30	ThAPT10.7

Determining Object Geometry with Compliance and Simple Sensors*.

    Jentoft, Leif P. (Harvard Univ.), Howe, Robert D. (Harvard Univ.)

08:00-09:30	ThAPT10.8

Usability of a Virtual Reality System Based on a Wearable Haptic Interface*.

    Kossyk, Ingo (German Aerospace Center (DLR)), Dörr, Jonas (Univ. of Tech. Berlin), Raschendörfer, Lars (Univ. of Tech. Berlin), Kondak, Konstantin (German Aerospace Center)

08:00-09:30	ThAPT10.9

Teaching by Touching: Interpretation of Tactile Instructions for Motion Development*.

    DallaLibera, Fabio (Padua Univ.), Basoeki, Fransiska (Osaka Univ.), Minato, Takashi (ATR), Ishiguro, Hiroshi (Osaka Univ.), Menegatti, Emanuele (The Univ. of Padua)

08:00-09:30	ThAPT10.10

Deterministic Kinodynamic Planning with Hardware Demonstrations*.

    Gaillard, François (ISEN SMAC LIFL), Soulignac, Michaël (ISEN Lille), Dinont, Cédric (ISEN), Mathieu, Philippe (Lab. d'Informatique Fondamentale de Lille Univ. des Sciences et Tech. de Lille)

08:00-09:30	ThAPT10.11

Navigation Meshes for Realistic Multi-Layered Environments*.

    van Toll, Wouter (Utrecht Univ.), Cook IV, Atlas F. (Utrecht Univ.), Geraerts, Roland (Utrecht Univ.)

08:00-09:30	ThAPT10.12

Solving Shortest Path Problems with Curvature Constraints Using Beamlets*.

    Arslan, Oktay (Georgia Inst. of Tech.), Tsiotras, Panagiotis (Georgia Tech.), Huo, Xiaoming (Georgia Inst. of Tech.)

08:00-09:30	ThAPT10.13

Path Tracking: Combined Path Following and Trajectory Tracking for Autonomous Underwater Vehicles (I)*.

    Xiang, Xianbo (Huazhong Univ. of Science and Tech.), Zhang, Qin (INRIA/UM2), Liu, Chao (LIRMM (UMR5506), CNRS, France)

08:00-09:30	ThAPT10.14

Autonomous Data Collection from Underwater Sensor Networks Using Acoustic Communication (I)*.

    Hollinger, Geoffrey (Univ. of Southern California), Mitra, Urbashi (Univ. of Southern California), Sukhatme, Gaurav (Univ. of Southern California)

08:00-09:30	ThAPT10.15

Modeling and Reactive Navigation of an Autonomous Sailboat*.

    Romero-Ramirez, Miguel-Angel (ISIR, UPMC), Pêtrès, Clément (Univ. Paris VI), Plumet, Frederic (UPMC)

08:00-09:30	ThAPT10.16

Cooperative Active Target Tracking for Heterogeneous Robots with Application to Gait Monitoring*.

    Morbidi, Fabio (Univ. of Texas at Arlington), Ray, Christopher (Univ. of Texas at Arlington), Mariottini, Gian Luca (Univ. of Texas at Arlington)

08:00-09:30	ThAPT10.17

Fast Visual People Tracking Using a Feature-Based People Detector*.

    Königs, Achim (Fraunhofer Inst. for Communication, InformationProcessing, and Ergonomics FKIE), Schulz, Dirk (FKIE)

08:00-09:30	ThAPT10.18

A Nonlinear Controller for People Guidance Based on Omnidirectional Vision*.

    Pereira, Flávio Garcia (Univ. Federal do Espírito Santo / Federal Univ. of Espírito Santo), Santos, Milton César Paes (Federal Univ. of Espírito Santo), Vassallo, Raquel Frizera (UFES)

08:00-09:30	ThAPT10.19

Generalized Programming of Modular Robots through Kinematic Configurations*.

    Bordignon, Mirko (Univ. of Southern Denmark), Stoy, Kasper (Univ. of Southern Denmark), Schultz, Ulrik Pagh (Univ. of Southern Denmark)

08:00-09:30	ThAPT10.20

Energy-Aware Coverage Control with Docking for Robot Teams*.

    Derenick, Jason (Univ. of Pennsylvania), Michael, Nathan (Univ. of Pennsylvania), Kumar, Vijay (Univ. of Pennsylvania)

08:00-09:30	ThAPT10.21

Optimization of Personal Distribution for Evacuation Guidance Based on Vector Field*.

    Okada, Masafumi (Tokyo Inst. of Tech.), Ando, Teruhisa (Tokyo Inst. of Tech.)

08:00-09:30	ThAPT10.22

Simultaneous Calibration, Localization, and Mapping*.

    Kuemmerle, Rainer (Univ. of Freiburg), Grisetti, Giorgio (Sapienza Univ. of Rome), Burgard, Wolfram (Univ. of Freiburg)

08:00-09:30	ThAPT10.23

Experimental Evaluation of New Methods for In-Situ Calibration of Attitude and Doppler Sensors for Underwater Vehicle Navigation*.

    Troni, Giancarlo (Johns Hopkins Univ.), Whitcomb, Louis (The Johns Hopkins Univ.)

08:00-09:30	ThAPT10.24

New Method for Global Identification of the Joint Drive Gains of Robots Using a Known Payload Mass*.

    Gautier, Maxime (Univ. of Nantes), Briot, Sébastien (IRCCyN)

ThBT1	Continental Parlor 1
Control for Manipulation & Grasping (Regular Session)	
Chair: Xiao, Jing	UNC-Charlotte
Co-Chair: Villani, Luigi	Univ. di Napoli Federico II

10:00-10:15	ThBT1.1

Adaptive Sliding Mode Control of Grasped Object Slip for Prosthetic Hands, pp. 4174-4179.

    Engeberg, Erik Daniel (Univ. of Akron), Meek, Sanford (Univ. of Utah)

10:15-10:30	ThBT1.2

Cartesian Impedance Control for a Variable Stiffness Robot Arm, pp. 4180-4186.

    Petit, Florian (German Aerospace Center (DLR)), Albu-Schäffer, Alin (DLR - German Aerospace Center)

10:30-10:45	ThBT1.3

Self-Tuning Cooperative Control of Manipulators with Position/Orientation Uncertainties in the Closed-Kinematic Loop, pp. 4187-4193.

    Aghili, Farhad (Canadian Space Agency)

10:45-10:50	ThBT1.4

Kinematic Control with Force Feedback for a Redundant Bimanual Manipulation System, pp. 4194-4200. Attachment

    Caccavale, Fabrizio (Univ. degli Studi della Basilicata), Lippiello, Vincenzo (Univ. di Napoli Federico II), Muscio, Giuseppe (Univ. degli studi della Basilicata), Pierri, Francesco (Univ. della

Basilicata), Ruggiero, Fabio (Univ. di Napoli Federico II), Villani, Luigi (Univ. di Napoli Federico II)

10:50-10:55	ThBT1.5

Robust Manipulation for Temporary Lack of Sensory Information by a Multi-Fingered Hand-Arm System, pp. 4201-4206. Attachment

Kawamura, Akihiro (Kyushu Univ.), Tahara, Kenji (Kyushu Univ.), Kurazume, Ryo (Kyushu Univ.), Hasegawa, Tsutomu (Kyushu Univ.)

10:55-11:00	ThBT1.6

Determining "Grasping" Configurations for a Spatial Continuum Manipulator, pp. 4207-4214.

Li, Jinglin (Univ. of North Carolina - Charlotte), Xiao, Jing (UNC-Charlotte)

11:00-11:15	ThBT1.7

Impedance Control of a Non-Linearly Coupled Tendon Driven Thumb, pp. 4215-4221.

Chalon, Maxime (German Aerospace Center (DLR)), Friedl, Werner (German AerospaceCenter (DLR)), Reinecke, Jens (DLR), Wimboeck, Thomas (German Aerospace Center (DLR)), Albu-Schäffer, Alin (DLR - German Aerospace Center)

11:15-11:30	ThBT1.8

Energy Shaping Control for Robot Manipulators in Explicit Force Regulation Tasks with Elastic Environments, pp. 4222-4228.

Navarro-Alarcon, David (The Chinese Univ. of Hong Kong), Li, Peng (The Chinese Univ. of Hong Kong), Yip, Hiu Man (The Chinese Univ. of Hong Kong)

ThBT2	Continental Parlor 2
Mapping (Regular Session)	
Chair: Stachniss, Cyrill	Univ. of Freiburg
Co-Chair: Bryson, Mitch	Univ. of Sydney

10:00-10:15	ThBT2.1

Visual Mapping with Uncertainty for Correspondence-Free Localization Using Gaussian Process Regression, pp. 4229-4235.

Schairer, Timo (Univ. of Tuebingen), Huhle, Benjamin (Univ. of Tuebingen), Vorst, Philipp (Univ. of Tübingen), Schilling, Andreas (Univ. of Tuebingen, WSI/GRIS), Strasser, Wolfgang (Univ. of Tuebingen)

10:15-10:30	ThBT2.2

Distributed Large Scale Terrain Mapping for Mining and Autonomous Systems, pp. 4236-4241.

Thompson, Paul (The Univ. of Sydney), Nettleton, Eric (The Univ. of Sydney), Durrant-Whyte, Hugh (The Univ. of Sydney)

10:30-10:45	ThBT2.3

Dense Visual Mapping of Large Scale Environments for Real-Time Localisation, pp. 4242-4248. Attachment

Meilland, Maxime (INRIA Sophia Antipolis), Comport, Andrew Ian (CNRS), Rives, Patrick (INRIA)

10:45-10:50	ThBT2.4

Hierarchies of Octrees for Efficient 3D Mapping, pp. 4249-4255.

Wurm, Kai M. (Univ. of Freiburg), Hennes, Daniel (Maastricht Univ.), Holz, Dirk (Univ. of Bonn), Rusu, Radu Bogdan (Willow Garage, Inc), Stachniss, Cyrill (Univ. of Freiburg), Konolige, Kurt (Willow Garage), Burgard, Wolfram (Univ. of Freiburg)

10:50-10:55	ThBT2.5

A Comparison of Feature and Pose-Based Mapping Using Vision, Inertial and GPS on a UAV, pp. 4256-4262.

Bryson, Mitch (Univ. of Sydney), Sukkarieh, Salah (Univ. of Sydney)

10:55-11:00	ThBT2.6

Autonomous Semantic Mapping for Robots Performing Everyday Manipulation Tasks in Kitchen Environments, pp. 4263-4270. Attachment

Blodow, Nico (Tech. Univ. München), Goron, Lucian Cosmin (Univ. Tehnica Cluj-Napoca), Marton, Zoltan-Csaba (Tech. Univ. München), Pangercic, Dejan (TU Muenchen), Ruehr, Thomas (Tech. Univ. Muenchen), Tenorth, Moritz (TU München), Beetz, Michael (Tech. Univ. München)

11:00-11:15	ThBT2.7

Occupancy Grid Rasterization in Large Environments for Teams of Robots, pp. 4271-4276.

Strom, Johannes H. (Univ. of Michigan), Olson, Edwin (Univ. of Michigan)

11:15-11:30	ThBT2.8

Autonomous Mapping for Inspection of 3D Structures, pp. 4277-4283.

Tavakoli, Mahmoud (Univ. of Coimbra), Faria, Ricardo (Univ. of Coimbra), Marques, Lino (Univ. of Coimbra), de Almeida, Anibal (Univ. of Coimbra)

ThBT3	Continental Parlor 3
Randomized Planning & Kinematic Control (Regular Session)	
Chair: Amato, Nancy	Texas A&M Univ.
Co-Chair: Shammas, Elie	American Univ. of Beirut

10:00-10:15	ThBT3.1

FIRM: Feedback Controller-Based Information-State Roadmap, a Framework for Motion Planning under Uncertainty, pp. 4284-4291.

Agha-mohammadi, Ali-akbar (Texas A&M Univ.), Chakravorty, Suman (Texas A&M Univ.), Amato, Nancy (Texas A&M Univ.)

10:15-10:30	ThBT3.2

Computing Spanners of Asymptotically Optimal Probabilistic Roadmaps, pp. 4292-4298.

Marble, James (Univ. of Nevada Reno), Bekris, Kostas E. (Univ. of Nevada, Reno)

10:30-10:45	ThBT3.3

Optimal Probabilistic Robot Path Planning with Missing Information, pp. 4299-4306.

Movafaghpour, Mohamad Ali (Tarbiat Modares Univ.), Masehian, Ellips (Tarbiat Modares Univ.)

10:45-10:50	ThBT3.4

Asymptotically-Optimal Path Planning for Manipulation Using Incremental Sampling-Based Algorithms, pp. 4307-4313.

Perez, Alejandro (MIT Computer Science and Artificial Intelligence Lab.), Karaman, Sertac (Massachusetts Inst. of Tech.), Shkolnik, Alexander (MIT), Frazzoli, Emilio (Massachusetts Inst. of Tech.), Teller, Seth (MIT), Walter, Matthew (MIT)

10:50-10:55	ThBT3.5

Quasi-Static Motion Planning on Uneven Terrain for a Wheeled Mobile Robot, pp. 4314-4320. Attachment

Eathakota, Vijay (IIIT Hyderabad), Gattupalli, Aditya (IIIT , Hyderabad), Krishna, Madhava (IIIT Hyderabad)

10:55-11:00	ThBT3.6

Minimum-Time Trajectories for Kinematic Mobile Robots and Other Planar Rigid Bodies with Finite Control Sets, pp. 4321-4328.

Furtuna, Andrei (Dartmouth Coll.), Lu, Wenyu (Dartmouth Coll.), Wang, Weifu (Dartmouth Coll.), Balkcom, Devin (Dartmouth Coll.)

11:00-11:15	ThBT3.7

Exact Motion Planning Solution for Principally Kinematic Systems, pp. 4329-4334.

Shammas, Elie (American Univ. of Beirut), de Oliveira, Mauricio (Univ. of California, San Diego)

11:15-11:30   ThBT3.8

Continuous-Curvature Kinematic Control for Path Following Problems, pp. 4335-4340.

Girbés, Vicent (Tech. Univ. of Valencia), Armesto, Leopoldo (Univ. Pol. de Valencia Q4618002B), Tornero, Josep (Tech. Univ. of valencia), Solanes, Ernesto (Univ. Pol. de Valencia)

ThBT4	Continental Ballroom 4

Symposium: Stochasticity in Robotics and Biological Systems II (Invited Session)

Chair: Hsieh, M. Ani	Drexel Univ.
Co-Chair: Milutinovic, Dejan	Baskin School of Engineering, UC Santa Cruz
Organizer: Hsieh, M. Ani	Drexel Univ.
Organizer: Asada, Harry	MIT
Organizer: Chirikjian, Gregory	Johns Hopkins Univ.

10:00-10:15   ThBT4.1

A Trajectory-Based Calibration Method for Stochastic Motion Models (I), pp. 4341-4347.

Di Mario, Ezequiel (EPFL), Mermoud, Gregory (EPFL), Mastrangeli, Massimo (EPFL), Martinoli, Alcherio (EPFL)

10:15-10:30   ThBT4.2

Cooperative Multi-Agent Inference Over Grid Structured Markov Random Fields, pp. 4348-4353.

Williams, Ryan (Univ. of Southern California), Sukhatme, Gaurav (Univ. of Southern California)

10:30-10:45   ThBT4.3

Stochastic Optimal Control with Variable Impedance Manipulators in Presence of Uncertainties and Delayed Feedback (I), pp. 4354-4359.

Berret, Bastien (Italian Inst. of Tech.), Ivaldi, Serena (Italian Inst. of Tech. Univ. of Genoa), Nori, Francesco (ISTITUTO ITALIANO DI TECNOLOGIA), Sandini, Giulio (Italian Inst. of Tech.)

10:45-10:50   ThBT4.4

Stochastic Optimization of a Chain Sliding Mode Controller for the Mobile Robot Maneuvering, pp. 4360-4365. Attachment

Terekhov, Alexander V. (UPMC / CNRS), Mouret, Jean-Baptiste (Univ. Pierre et Marie Curie (UPMC)), Grand, Christophe (Univ. Pierre et Marie Curie)

10:50-10:55   ThBT4.5

Programmable 3D Stochastic Fluidic Assembly of Cm-Scale Modules, pp. 4366-4371.

Tolley, Michael Thomas (Harvard Univ.), Lipson, Hod (Cornell Univ.)

10:55-11:00   ThBT4.6

Hierarchical Congestion Control for Robotic Swarms, pp. 4372-4377. Attachment

Graciano Santos, Vinicius (Federal Univ. of Minas Gerais), Chaimowicz, Luiz (Federal Univ. of Minas Gerais)

11:00-11:15   ThBT4.7

Visual Localization in Fused Image and Laser Range Data (I), pp. 4378-4385.

Carlevaris-Bianco, Nicholas (Univ. of Michigan), Mohan, Anush (Univ. of Michigan at Ann Arbor (umich.edu)), McBride, James (Ford Motor Company), Eustice, Ryan (Univ. of Michigan)

11:15-11:30   ThBT4.8

A Mathematical Analysis of the Minimum Variance Model of Human-Like Reaching Movements (I), pp. 4386-4391.

Svinin, Mikhail (Kyushu Univ.), Yamamoto, Motoji (Kyushu Univ.)

ThBT5	Continental Ballroom 5

Symposium: Humanoid Technologies (Invited Session)

Chair: Asfour, Tamim	Karlsruhe Inst. of Tech. (KIT)
Co-Chair: Yokoi, Kazuhito	National Inst. of AIST
Organizer: Asfour, Tamim	Karlsruhe Inst. of Tech. (KIT)
Organizer: Sugano, Shigeki	Waseda Univ.
Organizer: Kagami, Satoshi	National Inst. of AIST

10:00-10:15   ThBT5.1

Semi-Plenary Invited Talk: Optimal Control of Motions of Humanoid Robots*.

Mombaur, Katja (Univ. of Heidelberg)

10:30-10:45   ThBT5.3

Hardware Improvement of Cybernetic Human HRP-4C for Entertainment Use (I), pp. 4392-4399.

Kaneko, Kenji (National Inst. of AIST), Kanehiro, Fumio (National Inst. of AIST), Morisawa, Mitsuharu (National Inst. of AIST), Tsuji, Tokuo (National Inst. of AIST), Miura, Kanako (National Inst. of AIST), Nakaoka, Shin'ichiro (AIST), Kajita, Shuuji (National Inst. of AIST), Yokoi, Kazuhito (National Inst. of AIST)

10:45-10:50   ThBT5.4

Humanoid Robot HRP-4 - Humanoid Robotics Platform with Lightweight and Slim Body - (I), pp. 4400-4407.

Kaneko, Kenji (National Inst. of AIST), Kanehiro, Fumio (National Inst. of AIST), Morisawa, Mitsuharu (National Inst. of AIST), Akachi, Kazuhiko (KAWADA INDUSTRIES,INC.), Miyamori, Go (Kawada Industries,Inc), Hayashi, Atsushi (Kawada Industries, Inc.), Kanehira, Noriyuki (Kawada Industries,Inc.)

10:50-10:55   ThBT5.5

Weakly Collision-Free Paths for Continuous Humanoid Footstep Planning (I), pp. 4408-4413. Attachment

Perrin, Nicolas Yves (Univ. de Toulouse ; UPS, INSA, INP, ISAE ; LAAS), Stasse, Olivier (CNRS/AIST), Lamiraux, Florent (CNRS), Yoshida, Eiichi (National Inst. of AIST)

10:55-11:00   ThBT5.6

Using a Multi-Objective Controller to Synthesize Simulated Humanoid Robot Motion with Changing Contact Configurations (I), pp. 4414-4419. Attachment

Bouyarmane, Karim (AIST Japan (Tsukuba)), Kheddar, Abderrahmane (CNRS)

11:00-11:15   ThBT5.7

Bipedal Walking Control Based on Capture Point Dynamics (I), pp. 4420-4427.

Englsberger, Johannes (DLR (German Aerospace Center)), Ott, Christian (German Aerospace Center (DLR)), Roa, Maximo A. (German Aerospace Center, DLR), Albu-Schäffer, Alin (DLR - German Aerospace Center), Hirzinger, Gerd (German Aerospace Center (DLR))

11:15-11:30   ThBT5.8

Human-Like Walking with Toe Supporting for Humanoids (I), pp. 4428-4435. Attachment

Miura, Kanako (National Inst. of AIST), Morisawa, Mitsuharu (National Inst. of AIST), Kanehiro, Fumio (National Inst. of AIST), Kajita, Shuuji (National Inst. of AIST), Kaneko, Kenji (National Inst. of AIST), Yokoi, Kazuhito (National Inst. of AIST)

ThBT6	Continental Ballroom 6

Symposium: Robots That Can See II (Invited Session)

Chair: Neira, José	Univ. de Zaragoza
Co-Chair: Fox, Dieter	Univ. of Washington
Organizer: Neira, José	Univ. de Zaragoza
Organizer: Newman, Paul	Oxford Univ.

10:00-10:15   ThBT6.1

Semi-Plenary Invited Talk: Vision in the Field*.

    Corke, Peter (QUT)

10:15-10:30   ThBT6.2

Semi-Plenary Invited Talk: Vision in Space*.

    Howard, Andrew (Space Exploration Tech. (SpaceX))

10:30-10:45   ThBT6.3

Capturing City-Level Scenes with a Synchronized Camera-Laser Fusion Sensor, pp. 4436-4441.

    Bok, Yunsu (KAIST), Choi, Dong - Geol (Korea Advanced Inst. of Science and Tech.), Jeong, Yekeun (KAIST), Kweon, In So (KAIST)

10:45-10:50   ThBT6.4

Vehicle Detection and Tracking at Nighttime for Urban Autonomous Driving, pp. 4442-4447.

    Tehrani Nik Nejad, Hossein (Toyota Tech. Inst.), Takahashi, Koji (Toyota Tech. Inst.), Mita, Seiichi (Toyota Tech. Inst.), McAllester, David (Toyota Tech. Inst. at Chicago)

10:50-10:55   ThBT6.5

Dense Multi-Planar Scene Estimation from a Sparse Set of Images, pp. 4448-4454.

    Argiles, Alberto (Univ. de Zaragoza), Civera, Javier (Univ. de Zaragoza), Montesano, Luis (Univ. de Zaragoza)

10:55-11:00   ThBT6.6

Plenoptic Flow: Closed-Form Visual Odometry for Light Field Cameras, pp. 4455-4462.

    Dansereau, Donald Gilbert (Univ. of Sydney), Mahon, Ian (Univ. of Sydney), Pizarro, Oscar (Australian Centre for Field Robotics), Williams, Stefan Bernard (Univ. of Sydney)

11:00-11:15   ThBT6.7

Real-Time Step Edge Estimation Using Stereo Images for Biped Robot, pp. 4463-4468.

    Asatani, Minami (Honda R&D Co.,Ltd.), Sugimoto, Shigeki (Tokyo Inst. of Tech.), Okutomi, Masatoshi (Tokyo Inst. of Tech.)

11:15-11:30   ThBT6.8

Exploiting Motion Priors in Visual Odometry for Vehicle-Mounted Cameras with Non-Holonomic Constraints, pp. 4469-4476.

    Scaramuzza, Davide (Univ. of Pennsylvania), Censi, Andrea (California Inst. of Tech.), Daniilidis, Kostas (Univ. of Pennsylvania)

ThBT7	Continental Parlor 7
Medical Robots & Systems (Regular Session)	
Chair: Dupont, Pierre	Children's Hospital Boston, Harvard Medical School
Co-Chair: Kim, Jung	KAIST

10:00-10:15   ThBT7.1

Identification of a Hybrid Model for Simulation of the Instrument/trocar Interaction Force, pp. 4477-4482.

    Verspecht, Jonathan (Univ. libre de Bruxelles), Catoire, Laurent (Univ. Libre de Bruxelles), Torfs, Serge (Univ. libre de Bruxelles), Kinnaert, Michel (Univ. Libre de Bruxelles)

10:15-10:30   ThBT7.2

A Fast Classification System for Decoding of Human Hand Configurations Using Multi-Channel Semg Signals, pp. 4483-4487.

    Park, Myoung Soo (Korea Inst. of Science and Tech.), Kim, Keehoon (Korea Inst. of Science and Tech.), Oh, Sang-Rok (KIST)

10:30-10:45   ThBT7.3

Bio-Inspired Active Soft Orthotic Device for Ankle Foot Pathologies, pp. 4488-4495. Attachment

    Park, Yong-Lae (Harvard Univ.), Chen, Bor-rong (Harvard Univ.), Young, Diana (Wyss Inst. of Biologically Inspired Engineering at Harvard U), Stirling, Leia (Wyss Inst. for Biologically Inspired Engineering, Harvard Un), Wood, Robert (Harvard Univ.), Goldfield, Eugene (Children's Hospital Boston, Harvard Medical School), Nagpal, Radhika (Harvard Univ.)

10:45-10:50   ThBT7.4

A Preliminary Experiment for Transferring Human Motion to a Musculoskeletal Robot - Decomposition of Human Running Based on Muscular Coordination -, pp. 4496-4501.

    Iimura, Taiki (Osaka Univ.), Inoue, Keita (Graduate school of engineering science of Osaka Univ.), Pham, Hang (Graduate School of Engineering Science, Osaka Univ.), Hirai, Hiroaki (Graduate School of Engineering Science, Osaka Univ.), Miyazaki, Fumio (Graduate School of Engineering Science, Osaka Univ.)

10:50-10:55   ThBT7.5

Heart Motion Simulator for Motion Compensation, pp. 4502-4507.

    Iskakov, Renat (German Aerospace Center - DLR), Groeger, Martin (German Aerospace Center (DLR)), Hirzinger, Gerd (German Aerospace Center (DLR))

10:55-11:00   ThBT7.6

MRI-Powered Actuators for Robotic Interventions, pp. 4508-4515. Attachment

    Vartholomeos, Panagiotis (Brigham and Women's Hospital, Harvard Medical School), Qin, Lei (Brigham and Women's Hospital, Harvard Medical School), Dupont, Pierre (Children's Hospital Boston, Harvard Medical School)

11:00-11:15   ThBT7.7

New Approach for Abnormal Tissue Localization with Robotic Palpation and Mechanical Property Characterization, pp. 4516-4521.

    Ahn, Bummo (Korea Advanced Inst. of Science and Tech. (KAIST)), Kim, Yeongjin (KAIST), Kim, Jung (KAIST)

11:15-11:30   ThBT7.8

Position Estimation of an Epicardial Crawling Robot on the Beating Heart by Modeling of Physiological Motion, pp. 4522-4527.

    Wood, Nathan (Carnegie Mellon Univ.), Moral del Agua, Diego (Univ. of Valladolid), Zenati, Marco (Univ. of Pittsburgh), Riviere, Cameron (Carnegie Mellon Univ.)

ThBT8	Continental Parlor 8
Search & Rescue Robots (Regular Session)	
Chair: Chung, Timothy H.	Naval Postgraduate School
Co-Chair: Hollinger, Geoffrey	Univ. of Southern California

10:00-10:15   ThBT8.1

Repairing Plans for Object Finding in 3-D Environments, pp. 4528-4535.

    Espinoza León, Judith (CIMAT), Murrieta-Cid, Rafael (Center for Mathematical Res.)

10:15-10:30   ThBT8.2

Searching for Multiple Targets Using Probabilistic Quadtrees, pp. 4536-4543. Attachment

    Carpin, Stefano (Univ. of California, Merced), Burch, Derek (Univ. of California, Merced), Chung, Timothy H. (Naval Postgraduate School)

10:30-10:45   ThBT8.3

Optimal Deployment of Robotic Teams for Autonomous Wilderness Search and Rescue, pp. 4544-4549.

Macwan, Ashish (Univ. of Toronto), Nejat, Goldie (Univ. of Toronto), Benhabib, Beno (Univ. of Toronto)

10:45-10:50	ThBT8.4

Development of the High Strength Retractable Skin and the Closed Type Crawler Vehicle, pp. 4550-4555. Attachment

Aoki, Takeshi (Chiba Inst. of Tech.), Karino, Takahiro (Chiba Inst. of Tech.), Kuwahara, Hiroyuki (SUSTAINable Robotics)

10:50-10:55	ThBT8.5

Human-In-The-Loop: MPC for Shared Control of a Quadruped Rescue Robot, pp. 4556-4561.

Chipalkatty, Rahul (Georgia Inst. of Tech.), Daepp, Hannes (Georgia Inst. of Tech.), Egerstedt, Magnus (Georgia Inst. of Tech.), Book, Wayne (Georgia Inst. of Tech.)

10:55-11:00	ThBT8.6

Detection and Tracking of Road Networks in Rural Terrain by Fusing Vision and LIDAR, pp. 4562-4568. Attachment

Manz, Michael (Univ. of the Bundeswehr Munich), Himmelsbach, Michael (Univ. of the Bundeswehr Munich), Luettel, Thorsten (Univ. of the Bundeswehr Muenchen), Wuensche, Hans J (UniBw Munich)

ThBT9	Continental Parlor 9

Intelligent Transportation Systems (Automotive) (Regular Session)

Chair: Radig, Bernd	TU Muenchen
Co-Chair: Nieto, Juan	Univ. of Sydney, Australian Centre for Field Robotics

10:00-10:15	ThBT9.1

On-Line Estimation of a Stability Metric Including Grip Conditions and Slope: Application to Rollover Prevention for All-Terrain Vehicles, pp. 4569-4574.

Richier, Mathieu (Cemagref), Lenain, Roland (Cemagref), Thuilot, Benoit (Clermont-Ferrand Univ.), Debain, Christophe (CEMAGREF/FR-TIMS)

10:15-10:30	ThBT9.2

Tracking Objects of Arbitrary Shape Using Expectation Maximization Algorithm, pp. 4575-4580.

Zeng, Shuqing (General Motors Res. and Development), Li, Yuanhong (General Moyors Corp.), Shen, Yantao (Univ. of Nevada, Reno)

10:30-10:45	ThBT9.3

Autonomous Intersection Management: Multi-Intersection Optimization, pp. 4581-4586.

Hausknecht, Matthew (Univ. of Texas at Austin), Au, Tsz-Chiu (The Univ. of Texas at Austin), Stone, Peter (Univ. of Texas at Austin)

10:45-10:50	ThBT9.4

Evaluation of Different Approaches for Road Course Estimation Using Imaging Radar, pp. 4587-4592.

Sarholz, Frederik (Daimler AG), Mehnert, Jens (Daimler), Klappstein, Jens (Daimler AG), Dickmann, Jürgen (Daimler AG), Radig, Bernd (TU Muenchen)

10:50-10:55	ThBT9.5

A Car Transportation System Using Multiple Mobile Robots: Icart II, pp. 4593-4600.

Kashiwazaki, Koshi (Tohoku Univ.), Yonezawa, Naoaki (Tohoku Univ.), Endo, Mitsuru (Tohoku Univ.), Kosuge, Kazuhiro (Tohoku Univ.), Sugahara, Yusuke (Tohoku Univ.), Hirata, Yasuhisa (Tohoku Univ.), Kanbayashi, Takashi (Ishikawajima Transport

Machinery Co. Ltd.), Suzuki, Kouki (Ishikawajima Transport Machinery Co. Ltd.), Murakami, Kazunori (Ishikawajima Transport Machinery Co. Ltd.), Nakamura, Kenichi (Ishikawajima Transport Machinery Co. Ltd.)

10:55-11:00	ThBT9.6

Probabilistic Road Geometry Estimation Using a Millimetre-Wave Radar, pp. 4601-4607. Attachment

Hernandez-Gutierrez, Andres (Univ. of Sydney, Australian Centre for Field Robotics), Nieto, Juan (Univ. of Sydney, Australian Centre for Field Robotics), Bailey, Tim (Univ. of Sydney), Nebot, Eduardo (Unversity of Sydney)

11:00-11:15	ThBT9.7

Intelligent Driver Drowsiness Detection System Using Uncorrelated Fuzzy Locality Preserving Analysis, pp. 4608-4614.

Khushaba, Rami (Univ. of Tech. Sydney), Kodagoda, Sarath (Univ. of Tech. Sydney), Lal, Sara (Univ. of Tech. Sydney (UTS)), Dissanayake, Gamini (Univ. of Tech. Sydney)

11:15-11:30	ThBT9.8

An Efficient Control Strategy for the Traffic Coordination of AGVs, pp. 4615-4620.

Olmi, Roberto (Univ. of Modena and Reggio Emilia), Secchi, Cristian (Univ. of Modena & Reggio Emilia), Fantuzzi, Cesare (Univ. di Modena e Reggio Emilia)

ThBPT10	Golden Gate Room

Interactive X (Interactive Session)

10:00-11:30	ThBPT10.1

Deflection-Based Force Sensing for Continuum Robots: A Probabilistic Approach.

Rucker, Caleb (Vanderbilt Univ.), Webster III, Robert James (Vanderbilt Univ.)

10:00-11:30	ThBPT10.2

Optimality Principles in Stiffness Control: The VSA Hammer.

Garabini, Manolo (Centro interdipartimentale di Ricerca E. Piaggio - Univ. di Pisa), Passaglia, Andrea (Univ. di Pisa), Belo, Felipe (Univ. of Pisa), Salaris, Paolo (Univ. of Pisa), Bicchi, Antonio (Univ. of Pisa)

10:00-11:30	ThBPT10.3

A Novel Stiffness Node Controller Which Enables Simultaneous Regulation of Torque and Stiffness in Multi-Muscle Driven Joints.

Annunziata, Salvatore (Univ. of Bielefeld), Paskarbeit, Jan (Univ. of Bielefeld), Schneider, Axel (Univ. of Bielefeld)

10:00-11:30	ThBPT10.4

Tracking a Depth Camera: Parameter Exploration for Fast ICP.

Pomerleau, Francois (ETH Zurich), Magnenat, Stéphane (ETH Zürich), Colas, Francis (ETH Zürich), Liu, Ming (ETH Zurich), Siegwart, Roland (ETH Zurich)

10:00-11:30	ThBPT10.5

Watertight Surface Reconstruction of Caves from 3D Laser Data.

Holenstein, Claude (CSIRO), Zlot, Robert (CSIRO), Bosse, Michael (CSIRO ICT Centre)

10:00-11:30	ThBPT10.6

People Detection in RGB-D Data.

Spinello, Luciano (Univ. of Freiburg), Arras, Kai Oliver (Univ. of Freiburg)

10:00-11:30	ThBPT10.7

A Graph Traversal Based Algorithm for Obstacle Detection Using Lidar or Stereo.

Das, Aveek (SRI International Sarnoff), Samarasekera, Supun

(SRI Sarnoff), Kuthirummal, Sujit (SRI International Sarnoff)

| 10:00-11:30 | ThBPT10.8 |

Iterative Path Optimization for Practical Robot Planning*.

Richardson, Andrew (Univ. of Michigan), Olson, Edwin (Univ. of Michigan)

| 10:00-11:30 | ThBPT10.9 |

Analysis of the Discontinuities in Prioritized Tasks-Space Control under Discreet Task Scheduling Operations*.

Keith, François (INRIA Rhône-Alpes), Wieber, Pierre-Brice (INRIA Rhône-Alpes), Mansard, Nicolas (CNRS), Kheddar, Abderrahmane (CNRS)

| 10:00-11:30 | ThBPT10.10 |

Probability of Success in Stochastic Robot Navigation with State Feedback (I)*.

Shah, Shridhar (Univ. of Delaware), Pahlajani, Chetan (Univ. of Delaware), Tanner, Herbert G. (Univ. of Delaware)

| 10:00-11:30 | ThBPT10.11 |

A Stochastic Approach to Dubins Feedback Control for Target Tracking (I)*.

Anderson, Ross (Univ. of California, Santa Cruz), Milutinovic, Dejan (Baskin School of Engineering, UC Santa Cruz)

| 10:00-11:30 | ThBPT10.12 |

Optimization of Stochastic Strategies for Spatially Inhomogeneous Robot Swarms: A Case Study in Commercial Pollination (I)*.

Berman, Spring (Harvard Univ.), Nagpal, Radhika (Harvard Univ.), Halasz, Adam (West Virginia Univ.)

| 10:00-11:30 | ThBPT10.13 |

Time-Independent, Spatial Human Coordination for Humanoids*.

Palyart Lamarche, Jean Christophe (The Italian Inst. of Tech. (IIT)), Bruneau, Olivier (UVSQ / LISV), Fontaine, Jean-Guy (Italian Inst. of Tech.)

| 10:00-11:30 | ThBPT10.14 |

The Effect of Swing Leg Retraction on Running Energy Efficiency*.

Haberland, Matt (Massachusetts Inst. of Tech.), Karssen, Daniël (Delft Univ. of Tech.), Kim, Sangbae (Massachusetts Inst. of Tech.), Wisse, Martijn (Delft Univ. of Tech.)

| 10:00-11:30 | ThBPT10.15 |

Practical Bipedal Walking Control on Uneven Terrain Using Surface Learning and Push Recovery*.

Yi, Seung Joon (Univ. of Pennsylvania), Zhang, Byoung-Tak (Seoul National Univ.), Hong, Dennis (Virginia Tech.), Lee, Daniel D. (Univ. of Pennsylvania)

| 10:00-11:30 | ThBPT10.16 |

CD SLAM - Continuous Localization and Mapping in a Dynamic World*.

Pirker, Katrin (Graz Univ. of Tech.), Rüther, Matthias (Graz Univ. of Tech.), Bischof, Horst (Graz Univ. of Tech.)

| 10:00-11:30 | ThBPT10.17 |

Vision-Based Mobile Robot's SLAM and Navigation in Crowded Environments*.

Morioka, Hiroshi (Tokyo Inst. of Tech.), Sangkyu, Yi (Tokyo Inst. of Tech.), Hasegawa, Osamu (Tokyo Inst. of Tech.)

| 10:00-11:30 | ThBPT10.18 |

Vision Based Attitude and Altitude Estimation for UAVs in Dark Environments*.

Natraj, Ashutosh (Univ. de Picardie, Jules Verne, Amiens, France), Demonceaux, Cédric (Univ. of Burgundy), Vasseur, Pascal (Univ. de Rouen), Sturm, Peter (INRIA Rhone Alpes)

| 10:00-11:30 | ThBPT10.19 |

The Mechanism of the Linear Load-Sensitive Continuously Variable Transmission with the Spherical Driving Unit*.

Tadakuma, Kenjiro (Osaka Univ.), Tadakuma, Riichiro (Yamagata Univ.), Terada, Kazuki (the Univ. of Electro-Communications), Higashimori, Mitsuru (Osaka Univ.), Kaneko, Makoto (Osaka Univ.)

| 10:00-11:30 | ThBPT10.20 |

Dynamic Model of a Hyper-Redundant, Octopus-Like Manipulator for Underwater Applications*.

Kang, Rongjie (Istituto Italiano di Tecnologia), Kazakidi, Asimina (Foundation for Res. & Tech. - Hellas (FORTH)), Guglielmino, Emanuele (Italian Inst. of Tech.), Branson, David (Istituto Italiano di Tecnologia (IIT)), Tsakiris, Dimitris (FORTH), Ekaterinaris, John A. (Inst. of Applied and Computational Mathematics, Foundation for Res. and Tech. - Hellas, GR 70013, Crete, Greece), Caldwell, Darwin G. (Italian Inst. of Tech.)

| 10:00-11:30 | ThBPT10.21 |

Three Module Lumped Element Model of a Continuum Arm Section*.

Giri, Nivedhitha (Clemson Univ.), Walker, Ian (Clemson Univ.)

| 10:00-11:30 | ThBPT10.22 |

Performance Analysis and Odometry Improvement of an Omnidirectional Mobile Robot for Outdoor Terrain*.

Ishigami, Genya (Japan Aerospace Exploration Agency (JAXA)), Pineda, Elvine Philip (Massachusetts Inst. of Tech.), Overholt, Jim (US Army), Hudas, Greg (US Army RDECOM-TARDEC), Iagnemma, Karl (MIT)

| 10:00-11:30 | ThBPT10.23 |

Inertial Rotation Center Position Estimation for a Perching Treaded Vehicle*.

Schmidt-Wetekam, Christopher (Univ. of California San Diego), Morozovsky, Nicholas (Univ. of California San Diego), Bewley, Thomas (Flow Control & Coordinated Robotics Lab.)

| 10:00-11:30 | ThBPT10.24 |

Improving Near-To-Near Lateral Control of Platoons without Communication*.

Yazbeck, Jano (INRIA, Nancy 1 Univ. / LORIA), Scheuer, Alexis (Nancy 1 Univ. / LORIA), Simonin, Olivier (LORIA), Charpillet, Francois (INRIA, Loria)

| 10:00-11:30 | ThBPT10.25 |

Parameterizing Actions to Have the Appropriate Effects*.

Mösenlechner, Lorenz (Tech. Univ. München), Beetz, Michael (Tech. Univ. München)

| 10:00-11:30 | ThBPT10.26 |

Physics-Based Modeling of an Anthropomimetic Robot*.

Wittmeier, Steffen (Tech. Univ. of Munich), Jäntsch, Michael (Tech. Univ. of Munich), Dalamagkidis, Konstantinos (TU Munich), Knoll, Alois (TU Munich)

| 10:00-11:30 | ThBPT10.27 |

Reexamining Lucas-Kanade Method for Real-Time Independent Motion Detection: Application to the Icub Humanoid Robot*.

Ciliberto, Carlo (ISTITUTO ITALIANO DI TECNOLOGIA), Pattacini, Ugo (Istituto Italiano di Tecnologia), Natale, Lorenzo (Istutito Italiano di Tecnologia), Nori, Francesco (ISTITUTO ITALIANO DI TECNOLOGIA), Metta, Giorgio (Istituto Italiano di Tecnologia (IIT))

| **ThPT11** | Continental Ballroom |

Plenary III: Self-Driving Cars (Plenary Session)

| Chair: Christensen, Henrik Iskov | Georgia Inst. of Tech. |

| 13:30-14:30 | ThPT11.1 |

Self-Driving Cars*.

Thrun, Sebastian (Stanford Univ.)

ThCT1 — Continental Parlor 1

Manipulation (Regular Session)

Chair: Stilman, Mike	Georgia Tech.
Co-Chair: Righetti, Ludovic	Univ. of Southern California

14:45-15:00 — ThCT1.1

On the Advantages of Task Motion Multigraphs for Efficient Mobile Manipulation (I), pp. 4621-4626.

Sucan, Ioan Alexandru (Rice Univ.), Kavraki, Lydia (Rice Univ.)

15:00-15:15 — ThCT1.2

Push Planning for Object Placement on Cluttered Table Surfaces (I), pp. 4627-4632. Attachment

Cosgun, Akansel (Georgia Inst. of Tech.), Hermans, Tucker (Georgia Inst. of Tech.), Emeli, Victor (Georgia Inst. of Tech.), Stilman, Mike (Georgia Tech.)

15:15-15:30 — ThCT1.3

Distributed Generalization of Learned Planning Models in Robot Programming by Demonstration, pp. 4633-4638.

Jäkel, Rainer (Karlsruhe Inst. of Tech.), Meißner, Pascal (FZI - Res. Center for Information Tech.), Schmidt-Rohr, Sven R. (Karlsruhe Inst. of Tech.), Dillmann, Rüdiger (KIT Karlsruher Inst. für Tech.)

15:30-15:35 — ThCT1.4

Learning Force Control Policies for Compliant Manipulation (I), pp. 4639-4644. Attachment

Kalakrishnan, Mrinal (Univ. of Southern California), Righetti, Ludovic (Univ. of Southern California), Pastor, Peter (Univ. of Southern California), Schaal, Stefan (Univ. of Southern California)

15:35-15:40 — ThCT1.5

Autonomous Indoor Aerial Gripping Using a Quadrotor (I), pp. 4645-4651.

Ghadiok, Vaibhav (Utah State Univ.), Goldin, Jeremy (Utah State Univ.), Ren, Wei (Utah State Univ.)

15:40-15:45 — ThCT1.6

Shooting Manipulation System with High Reaching Accuracy, pp. 4652-4657. Attachment

Hatakeyama, Tomofumi (Univ. of Tsukuba), Mochiyama, Hiromi (Univ. of Tsukuba)

15:45-16:00 — ThCT1.7

Interactive Manipulation between a Human and a Humanoid: When Robots Control Human Arm Motion, pp. 4658-4663. Attachment

Adorno, Bruno Vilhena (Univ. of Montpellier 2 / CNRS - LIRMM), Bó, Antônio Padilha Lanari (Univ. de Brasília), Fraisse, Philippe (LIRMM)

16:00-16:15 — ThCT1.8

A Novel Approach to the Manipulation of Body-Parts Ownership Using a Bilateral Master-Slave System, pp. 4664-4669.

Hara, Masayuki (The Univ. of Tokyo), Rognini, Giulio (EPFL), Evans, Nathan (EPFL), Blanke, Olaf (EPFL), Yamamoto, Akio (Univ. of Tokyo), Bleuler, Hannes (Ec. Pol. Federale de Lausanne), Higuchi, Toshiro (The Univ. of Tokyo)

ThCT2 — Continental Parlor 2

Industrial Robots (Regular Session)

Chair: Ota, Jun	The Univ. of Tokyo
Co-Chair: Johansson, Rolf	Lund Univ.

14:45-15:00 — ThCT2.1

Assembly Strategy Modeling and Selection for Human and Robot Coordinated Cell Assembly, pp. 4670-4675.

Chen, Fei (Nagoya Univ.), Sekiyama, Kosuke (Nagoya Univ.), Sasaki, Hironobu (Nagoya Univ.), Huang, Jian (Huazhong Univ. of Science and Tech.), Sun, Baiqing (Nagoya Univ.), Fukuda, Toshio (Nagoya Univ.)

15:00-15:15 — ThCT2.2

Stereographic Projection for Industrial Manipulator Tasks: Theory and Experiments, pp. 4676-4683.

Bjerkeng, Magnus (Norwegian Univ. of Science and Tech.), Pettersen, Kristin Y. (Norwegian Univ. of Science and Tech.), Kyrkjebø, Erik (SINTEF ICT)

15:15-15:30 — ThCT2.3

Reusable Hybrid Force-Velocity Controlled Motion Specifications with Executable Domain Specific Languages, pp. 4684-4689. Attachment

Klotzbuecher, Markus (Katholieke Univ. Leuven), Smits, Ruben (Katholieke Univ. Leuven), Bruyninckx, Herman (Katholieke Univ. Leuven), De Schutter, Joris (Katholieke Univ. Leuven)

15:30-15:35 — ThCT2.4

Entropy-Based Motion Selection for Touch-Based Registration Using Rao-Blackwellized Particle Filtering, pp. 4690-4697. Attachment

Taguchi, Yuichi (Mitsubishi Electric Res. Lab.), Marks, Tim K. (Mitsubishi Electric Res. Lab. (MERL)), Hershey, John R. (MERL)

15:35-15:40 — ThCT2.5

Manipulator System Selection Based on Evaluation of Task Completion Time and Cost, pp. 4698-4703. Attachment

Huang, Yanjiang (The Res. into Artifacts, Center forEngineering,TheUniversity), Gueta, Lounell B. (Center for Engineering, Univ. of Tokyo), Chiba, Ryosuke (Tokyo Metropolitan Univ.), Arai, Tamio (The Univ. of Tokyo), Ueyama, Tsuyoshi (DENSO WAVE INCORPORATED), Sugi, Masao (Tokyo Univ. of Agriculture and Tech.), Ota, Jun (The Univ. of Tokyo)

15:40-15:45 — ThCT2.6

Modeling and Control of a Piezo-Actuated High-Dynamic Compensation Mechanism for Industrial Robots, pp. 4704-4709.

Olofsson, Bjorn (Lund Univ.), Sornmo, Olof (Lund Univ.), Schneider, Ulrich (Fraunhofer IPA), Robertsson, Anders (LTH, Lund Univ.), Puzik, Arnold (Fraunhofer IPA), Johansson, Rolf (Lund Univ.)

15:45-16:00 — ThCT2.7

Dynamics Identification of Industrial Robots Using Contact Force for the IDCS Control, pp. 4710-4715. Attachment

Aoki, Kengo (Tokyo Univ. of Agriculture and Tech.), Venture, Gentiane (Tokyo Univ. of Agriculture and Tech.), Tagawa, Yasutaka (Tokyo Univ. of Agriculture and Tech.)

16:00-16:15 — ThCT2.8

A Fast Distributed Auction and Consensus Process Using Parallel Task Allocation and Execution, pp. 4716-4721.

Das, Gautham (Univ. of Ulster), McGinnity, Martin (Univ. of Ulster), Coleman, Sonya (Univ. of Ulster), Behera, Laxmidhar (IIT Kanpur)

ThCT3 — Continental Parlor 3

Marine Systems I (Regular Session)

Chair: Barkby, Stephen	Univ. of Sydney
Co-Chair: Huntsberger, Terry	Jet Propulsion Lab.

15:00-15:15 — ThCT3.2

Toward Automatic Classification of Chemical Sensor Data from Autonomous Underwater Vehicles, pp. 4722-4727.

Jakuba, Michael (Univ. of Sydney), Steinberg, Daniel (The Univ. of

Sydney), Kinsey, James (Woods Hole Oceanographic Inst.), Yoerger, Dana (Woods Hole Oceanographic Inst.), Camilli, Richard (Woods Hole Oceanographic Inst.), Pizarro, Oscar (Australian Centre for Field Robotics), Williams, Stefan Bernard (Univ. of Sydney)

15:15-15:30	ThCT3.3

Safe Maritime Navigation with COLREGs Using Velocity Obstacles, pp. 4728-4734.

Kuwata, Yoshiaki (Jet Propulsion Lab.), Wolf, Michael (Jet Propulsion Lab.), Zarzhitsky, Dimitri (Jet Propulsion Lab.), Huntsberger, Terry (Jet Propulsion Lab.)

15:30-15:35	ThCT3.4

A Novel Propulsion Method of Flexible Underwater Robots, pp. 4735-4740.

Shintake, Jun (The Univ. of Electro-Communications), Ming, Aiguo (The Univ. of Electro-Communications), Shimojo, Makoto (Univ. of Electro-COmmunications)

15:35-15:40	ThCT3.5

On Adaptive Underwater Object Detection, pp. 4741-4748.

Williams, David (NATO Undersea Res. Centre)

15:40-15:45	ThCT3.6

Modeling, Simulation, and Performance of a Synergistically Propelled Ichthyoid, pp. 4749-4755.

Strefling, Paul (Michigan State Univ.), Hellum, Aren (Michigan State Univ.), Mukherjee, Ranjan (Michigan State Univ.)

15:45-16:00	ThCT3.7

Pitch and Roll Control Using Independent Movable Floats for Small Underwater Robots, pp. 4756-4761.

Sakagami, Norimitsu (Tokai Univ.), Ueda, Tomohiro (Ritsumeikan Univ.), Shibata, Mizuho (Kinki Univ.), Kawamura, Sadao (Ritsumeikan Univ.)

ThCT4	Continental Ballroom 4
Symposium: (Self-)assembly from the Nano to the Macro Scale: State of the Art and Future Directions (Invited Session)	
Chair: Correll, Nikolaus	Univ. of Colorado at Boulder
Co-Chair: Yim, Mark	Univ. of Pennsylvania
Organizer: Correll, Nikolaus	Univ. of Colorado at Boulder
Organizer: Hsieh, M. Ani	Drexel Univ.
Organizer: Yim, Mark	Univ. of Pennsylvania

14:45-15:00	ThCT4.1

(Self-)assembly from the Nano to the Macro Scale*.

Correll, Nikolaus (Univ. of Colorado at Boulder), Hsieh, M. Ani (Drexel Univ.), Yim, Mark (Univ. of Pennsylvania)

15:00-15:15	ThCT4.2

Enhanced Directional Self-Assembly Based on Active Recruitment and Guidance (I), pp. 4762-4769.

Mathews, Nithin (Univ. Libre de Bruxelles), Christensen, Anders Lyhne (Lisbon Univ. Inst.), O'Grady, Rehan (Univ. Libre de Bruxelles), Rétornaz, Philippe (École Pol. Fédérale de Lausanne), Bonani, Michael (EPFL), Mondada, Francesco (EPFL), Dorigo, Marco (Univ. Libre de Bruxelles)

15:15-15:30	ThCT4.3

Self-Assembly for Maximum Yields under Constraints (I), pp. 4770-4775.

Fox, Michael (Georgia Inst. of Tech.), Shamma, Jeff (Georgia Inst. of Tech.)

15:30-15:35	ThCT4.4

Towards Language-Based Verification of Robot Behaviors (I), pp.

4776-4782.

Cowley, Anthony (Univ. of Pennsylvania), Taylor, Camillo Jose (Univ. of Pennsylvania)

15:35-15:40	ThCT4.5

Self-Assembly of Modular Robots from Finite Number of Modules Using Graph Grammars (I), pp. 4783-4789.

Rai, Vijeth (Univ. of Colorado, Boulder), van Rossum, Anne (Almende B.V.), Correll, Nikolaus (Univ. of Colorado at Boulder)

15:40-15:45	ThCT4.6

Constrained Task Partitioning for Distributed Assembly (I), pp. 4790-4796. Attachment

Worcester, James (Drexel Univ.), Rogoff, Joshua (Drexel Univ.), Hsieh, M. Ani (Drexel Univ.)

15:45-16:00	ThCT4.7

Structure Synthesis On-The-Fly in a Modular Robot, pp. 4797-4802. Attachment

Revzen, Shai (Univ. of Pennsylvania), Bhoite, Mohit (Univ. of Pennsylvania), Macasieb, Juan Antonio Miguel Lim (Univ. of Pennsylvania), Yim, Mark (Univ. of Pennsylvania)

16:00-16:15	ThCT4.8

Constraint-Aware Coordinated Construction of Generic Structures, pp. 4803-4810.

Stein, David (MIT), Schoen, Timothy Ryan (Massachusetts Inst. of Tech.), Rus, Daniela (MIT)

ThCT5	Continental Ballroom 5
Symposium: Humanoid Applications (Invited Session)	
Chair: Dillmann, Rüdiger	KIT Karlsruher Inst. für Tech.
Co-Chair: Sugano, Shigeki	Waseda Univ.
Organizer: Asfour, Tamim	Karlsruhe Inst. of Tech. (KIT)
Organizer: Sugano, Shigeki	Waseda Univ.
Organizer: Kagami, Satoshi	National Inst. of AIST

14:45-15:00	ThCT5.1

Semi-Plenary Invited Talk: Humanoid Robotics Research: Retrospection and Prospects*.

Asfour, Tamim (Karlsruhe Inst. of Tech. (KIT))

15:15-15:30	ThCT5.3

Actuation Requirements for Hopping and Running of the Musculoskeletal Robot BioBiped1 (I), pp. 4811-4818. Attachment

Radkhah, Katayon (Tech. Univ. Darmstadt), von Stryk, Oskar (Tech. Univ. Darmstadt)

15:30-15:35	ThCT5.4

Combined Intention, Activity, and Motion Recognition for a Humanoid Household Robot, pp. 4819-4825.

Gehrig, Dirk (Karlsruhe Inst. of Tech.), Krauthausen, Peter (Karlsruhe Inst. of Tech.), Rybok, Lukas (Karlsruhe Inst. of Tech. (KIT)), Kuehne, Hildegard (Insitute for Anthropomatics, Karlsruhe Inst. of Tech.), Hanebeck, Uwe D. (Karlsruhe Inst. of Tech. (KIT)), Schultz, Tanja (Univ. of Karlsruhe), Stiefelhagen, Rainer (Karlsruhe Inst. of Tech.)

15:35-15:40	ThCT5.5

An Expected Perception Architecture Using Visual 3D Reconstruction for a Humanoid Robot, pp. 4826-4831. Attachment

Moutinho, Nuno (Inst. Superior Técnico), Cauli, Nino (Scuola Superiore Sant'Anna, Italy), Falotico, Egidio (Scuola Superiore Sant'Anna), Ferreira, Ricardo (Inst. Superior Técnico), Gaspar, Jose (Inst. Superior Técnico - Inst. for Systems and Robotics), Bernardino, Alexandre (Inst. Superior Técnico - Inst. for Systems and Robotics), Santos-Victor, José (Inst. Superior Técnico - Inst. for Systems and Robotics), Dario, Paolo (Scuola Superiore

Sant'Anna), Laschi, Cecilia (Scuola Superiore Sant'Anna)

15:40-15:45	ThCT5.6

Multilayer Control of Skiing Robot, pp. 4832-4837. Attachment

Petric, Tadej (Jozef Stefan Inst.), Nemec, Bojan (Jozef Stefan Inst.), Babic, Jan (Jozef Stefan Inst.), Žlajpah, Leon (Jožef Stefan Inst.)

15:45-16:00	ThCT5.7

Development of Whole-Body Humanoid "Pneumat-BS" with Pneumatic Musculoskeletal System, pp. 4838-4843.

Ogawa, Keita (Osaka Univ.), Narioka, Kenichi (Osaka Univ.), Hosoda, Koh (Osaka Univ.)

16:00-16:15	ThCT5.8

Autonomous Climbing of Spiral Staircases with Humanoids, pp. 4844-4849. Attachment

Osswald, Stefan (Univ. of Freiburg), Goeroeg, Attila (Univ. of Freiburg), Hornung, Armin (Univ. of Freiburg), Bennewitz, Maren (Univ. of Freiburg)

ThCT6	Continental Ballroom 6
Symposium: Computer Vision for Robotics (Invited Session)	
Chair: Fox, Dieter	Univ. of Washington
Co-Chair: Neira, José	Univ. de Zaragoza
Organizer: Fox, Dieter	Univ. of Washington
Organizer: Davison, Andrew J	Imperial Coll. London

14:45-15:00	ThCT6.1

Semi-Plenary Invited Talk: Learning to Recognize Objects Despite Novel Environments and Sensors.

Darrell, Trevor (UC Berkeley)

15:15-15:30	ThCT6.3

RGB-D Object Discovery Via Multi-Scene Analysis, pp. 4850-4856.

Herbst, Evan (Univ. of Washington), Ren, Xiaofeng (Intel Lab.), Fox, Dieter (Univ. of Washington)

15:30-15:35	ThCT6.4

Online Learning for Automatic Segmentation of 3D Data, pp. 4857-4864.

Tombari, Federico (Univ. of Bologna), Di Stefano, Luigi (Univ. of Bologna), Giardino, Simone (Univ. of Bologna)

15:35-15:40	ThCT6.5

Shape-Based Depth Image to 3D Model Matching and Classification with Inter-View Similarity, pp. 4865-4870.

Wohlkinger, Walter (Vienna Univ. of Tech. (VUT)), Vincze, Markus (Vienna Univ. of Tech.)

15:40-15:45	ThCT6.6

Model for Unfolding Laundry Using Interactive Perception, pp. 4871-4876.

Willimon, Bryan (Clemson Univ.), Birchfield, Stan (Clemson Univ.), Walker, Ian (Clemson Univ.)

15:45-16:00	ThCT6.7

Perception for the Manipulation of Socks, pp. 4877-4884.

Wang, Ping Chuan (Univ. of California, Berkeley), Miller, Stephen (Univ. of Califonia at Berkeley), Fritz, Mario (Max-Planck-Inst. for Informatics), Darrell, Trevor (UC Berkeley), Abbeel, Pieter (UC Berkeley)

16:00-16:15	ThCT6.8

Mobile 3D Object Detection in Clutter, pp. 4885-4892.

Meger, David Paul (Univ. of British Columbia), Little, James J. (UBC)

ThCT7	Continental Parlor 7
Exoskeleton Robots & Gait Rehabilitation (Regular Session)	
Chair: Espiau, Bernard	INRIA
Co-Chair: Mavroidis, Constantinos	Northeastern Univ.

14:45-15:00	ThCT7.1

Design and Control of a Robotic Lower Extremity Exoskeleton for Gait Rehabilitation, pp. 4893-4898.

Unluhisarcikli, Ozer (Northeastern Univ.), Pietrusinski, Maciej (Northeastern Univ.), Weinberg, Brian (Northeastern Univ.), Bonato, Paolo (Harvard Medical School), Mavroidis, Constantinos (Northeastern Univ.)

15:00-15:15	ThCT7.2

Active Air Mat for Comfortable and Easy to Wear a Forearm Support System, pp. 4899-4904.

Hasegawa, Yasuhisa (Univ. of Tsukuba), Tayama, Munenori (Univ. of Tsukuba), Saito, Takefumi (Univ. of Tsukuba), Sankai, Yoshiyuki (Univ. of Tsukuba)

15:15-15:30	ThCT7.3

Ergonomic Considerations for Anthropomorphic Wrist Exoskeletons: A Simulation Study on the Effects of Joint Misalignment, pp. 4905-4910.

Esmaeili Malekabadi, Mohammad (Nanyang Tech. Univ.), Welihena Gamage, Kumudu Chalaka Gamage (Nanyang Tech. Univ.), Tan, Sia Nguan Eugene (Nanyang Tech. Univ.), Campolo, Domenico (Nanyang Tech. Univ.)

15:30-15:35	ThCT7.4

The Development and Testing of a Human Machine Interface for a Mobile Medical Exoskeleton, pp. 4911-4916. Attachment

Strausser, Katherine (Univ. of California, Berkeley), Kazerooni, Homayoon (Univ. of California at Berkeley)

15:35-15:40	ThCT7.5

A Self-Adjusting Knee Exoskeleton for Robot-Assisted Treatment of Knee Injuries, pp. 4917-4922.

Ergin, Mehmet Alper (Sabanci Univ.), Patoglu, Volkan (Sabanci Univ.)

15:40-15:45	ThCT7.6

Study of Body Weight Shifting on Robotic Assisted Gait Rehabilitation with NaTUre-Gaits, pp. 4923-4928.

Lim, Hup Boon (Nanyang Tech. Univ.), Luu, Trieu Phat (Nanyang Tech. Univ.), Hoon, Kay Hiang (Nanyang Tech. Univ.), Qu, Xingda (Nanyang Tech. Univ.), Tow, Adela (Tan Tock Seng Hospital), Low, K. H. (Nanyang Tech. Univ.)

ThCT8	Continental Parlor 8
Aerial Robots: Navigation, Tracking & Landing (Regular Session)	
Chair: Hrabar, Stefan	CSIRO ICT Centre
Co-Chair: Minor, Mark	Univ. of Utah

14:45-15:00	ThCT8.1

Chasing a Moving Target from a Flying UAV, pp. 4929-4934. Attachment

Teuliere, Celine (CEA-LIST), Eck, Laurent (CEA), Marchand, Eric (Univ. de Rennes 1, IRISA, INRIA Rennes)

15:00-15:15	ThCT8.2

A Fast and Adaptive Method for Estimating UAV Attitude from the Visual Horizon, pp. 4935-4940. Attachment

Moore, Richard James Donald (Univ. of Queensland), Thurrowgood, Saul (Univ. of Queensland), Bland, Daniel Peter (Univ. of Queensland), Soccol, Dean (Univ. of Queensland), Srinivasan, Mandyam (The Univ. of Queensland)

15:15-15:30	ThCT8.3

Autonomous Miniature Blimp Navigation with Online Motion Planning and Re-Planning, pp. 4941-4946. Attachment

    Mueller, Joerg (Univ. of Freiburg), Kohler, Norman (Univ. of Freiburg), Burgard, Wolfram (Univ. of Freiburg)

15:30-15:35	ThCT8.4

Efficient Target Geolocation by Highly Uncertain Small Air Vehicles, pp. 4947-4952.

    Grocholsky, Ben (Carnegie Mellon Univ.), Dille, Michael (Carnegie Mellon Univ.), Nuske, Stephen (CMU Robotics Inst.)

15:35-15:40	ThCT8.5

Beyond Visual Range Obstacle Avoidance and Infrastructure Inspection by an Autonomous Helicopter, pp. 4953-4960.

    Merz, Torsten (CSIRO), Kendoul, Farid (Australian Commonwealth Scientific and Res. (CSI)

15:40-15:45	ThCT8.6

Coordinated Landing of a Quadrotor on a Skid-Steered Ground Vehicle in the Presence of Time Delays, pp. 4961-4966.

    Daly, John Michael (Univ. of Waterloo), Ma, Yan (Univ. of Waterloo), Waslander, Steven Lake (Univ. of Waterloo)

15:45-16:00	ThCT8.7

Reactive Obstacle Avoidance for Rotorcraft UAVs, pp. 4967-4974. Attachment

    Hrabar, Stefan (CSIRO ICT Centre)

16:00-16:15	ThCT8.8

Avian-Inspired Passive Perching Mechanism for Robotic Rotorcraft, pp. 4975-4980.

    Doyle, Courtney (Univ. of Utah), Bird, Justin (Univ. of Utah), Isom, Taylor (Univ. of Utah), Johnson, Chris (Univ. of Utah), Kallman, Jason (Univ. of Utah), Simpson, Jason (Univ. of Utah), King, Raymond (Univ. of Utah), Abbott, Jake (Univ. of Utah), Minor, Mark (Univ. of Utah)

ThCT9	Continental Parlor 9
Swarms and Flocks (Regular Session)	
Chair: Shell, Dylan	Texas A&M Univ.
Co-Chair: Nagpal, Radhika	Harvard Univ.

14:45-15:00	ThCT9.1

Communication Assisted Navigation in Robotic Swarms: Self-Organization and Cooperation, pp. 4981-4988.

    Ducatelle, Frederick (IDSIA (USI/SUPSI)), Di Caro, Gianni A. (IDSIA (USI/SUPSI)), Pinciroli, Carlo (Univ. Libre de Bruxelles), Mondada, Francesco (EPFL), Gambardella, Luca (idsia)

15:00-15:15	ThCT9.2

Effect of Sensor and Actuator Quality on Robot Swarm Algorithm Performance, pp. 4989-4994.

    Hoff, Nicholas (Harvard Univ.), Wood, Robert (Harvard Univ.), Nagpal, Radhika (Harvard Univ.)

15:15-15:30	ThCT9.3

The Distributed Co-Evolution of an Embodied Simulator and Controller for Swarm Robot Behaviours, pp. 4995-5000.

    O'Dowd, Paul Jason (Univ. of the West of England, Bristol), Winfield, Alan (Univ. of the West of England, Bristol), Studley, Matthew (Univ. of the West of England, Bristol)

15:30-15:35	ThCT9.4

Flocking: Don't Need No Stinkin' Robot Recognition, pp. 5001-5006.

    Fine, Benjamin (Texas A&M Univ.), Shell, Dylan (Texas A&M Univ.)

15:35-15:40	ThCT9.5

Gas Source Localization in Indoor Environments Using Multiple Inexpensive Robots and Stigmergy, pp. 5007-5014.

    Di Rocco, Maurizio (Univ. di Roma Tre), Saffiotti, Alessandro (Orebro Univ.), Reggente, Matteo (AASS Res. Center - Learning Systems Lab.)

15:40-15:45	ThCT9.6

Reynolds Flocking in Reality with Fixed-Wing Robots: Communication Range vs. Maximum Turning Rate, pp. 5015-5020. Attachment

    Hauert, Sabine (EPFL), Leven, Severin (Ec. Pol. Federale de Lausanne), Varga, Maja (Univ. of Zagreb, Faculty of Electrical Engineering and Comp), Ruini, Fabio (Univ. of Plymouth), Cangelosi, Angelo (Univ. of Plymouth, UK), Zufferey, Jean-Christophe (EPFL), Floreano, Dario (Ec. Pol. Federal, Lausanne)

15:45-16:00	ThCT9.7

Human Swarm Modeling in Exhibition Space and Space Design, pp. 5021-5026. Attachment

    Okada, Masafumi (Tokyo Inst. of Tech.), Motegi, Yuichi (Tokyo Inst. of Tech.), Yamamoto, Ko (Tokyo Inst. of Tech.)

16:00-16:15	ThCT9.8

ARGoS: A Modular, Multi-Engine Simulator for Heterogeneous Swarm Robotics (I), pp. 5027-5034.

    Pinciroli, Carlo (Univ. Libre de Bruxelles), Trianni, Vito (Univ. Libre de Bruxelles), O'Grady, Rehan (Univ. Libre de Bruxelles), Pini, Giovanni (Univ. Libre de Bruxelles), Brutschy, Arne (Univ. Libre de Bruxelles), Brambilla, Manuele (Univ. Libre de Bruxelles), Mathews, Nithin (Univ. Libre de Bruxelles), Ferrante, Eliseo (Univ. Libre de Bruxelles), Di Caro, Gianni A. (IDSIA (USI/SUPSI)), Ducatelle, Frederick (IDSIA (USI/SUPSI)), Stirling, Timothy (EPFL), Gutierrez, Alvaro (Univ. Pol. de Madrid), Gambardella, Luca (idsia), Dorigo, Marco (Univ. Libre de Bruxelles)

ThCPT10	Golden Gate Room
Interactive XI (Interactive Session)	

14:45-16:15	ThCPT10.1

*Kinematic Control with Force Feedback for a Redundant Bimanual Manipulation System**.

    Caccavale, Fabrizio (Univ. degli Studi della Basilicata), Lippiello, Vincenzo (Univ. di Napoli Federico II), Muscio, Giuseppe (Univ. degli studi della Basilicata), Pierri, Francesco (Univ. della Basilicata), Ruggiero, Fabio (Univ. di Napoli Federico II), Villani, Luigi (Univ. di Napoli Federico II)

14:45-16:15	ThCPT10.2

*Robust Manipulation for Temporary Lack of Sensory Information by a Multi-Fingered Hand-Arm System**.

    Kawamura, Akihiro (Kyushu Univ.), Tahara, Kenji (Kyushu Univ.), Kurazume, Ryo (Kyushu Univ.), Hasegawa, Tsutomu (Kyushu Univ.)

14:45-16:15	ThCPT10.3

*Determining "Grasping" Configurations for a Spatial Continuum Manipulator**.

    Li, Jinglin (Univ. of North Carolina - Charlotte), Xiao, Jing (UNC-Charlotte)

14:45-16:15	ThCPT10.4

*Hierarchies of Octrees for Efficient 3D Mapping**.

    Wurm, Kai M. (Univ. of Freiburg), Hennes, Daniel (Maastricht Univ.), Holz, Dirk (Univ. of Bonn), Rusu, Radu Bogdan (Willow Garage, Inc), Stachniss, Cyrill (Univ. of Freiburg), Konolige, Kurt (Willow Garage), Burgard, Wolfram (Univ. of Freiburg)

14:45-16:15	ThCPT10.5

A Comparison of Feature and Pose-Based Mapping Using Vision, Inertial and GPS on a UAV*.

Bryson, Mitch (Univ. of Sydney), Sukkarieh, Salah (Univ. of Sydney)

14:45-16:15	ThCPT10.6

Autonomous Semantic Mapping for Robots Performing Everyday Manipulation Tasks in Kitchen Environments*.

Pangercic, Dejan (TU Muenchen), Blodow, Nico (Tech. Univ. München), Marton, Zoltan-Csaba (Tech. Univ. München), Ruehr, Thomas (Tech. Univ. Muenchen), Tenorth, Moritz (TU München), Beetz, Michael (Tech. Univ. München), Goron, Lucian Cosmin (Univ. Tehnica Cluj-Napoca)

14:45-16:15	ThCPT10.7

Asymptotically-Optimal Path Planning for Manipulation Using Incremental Sampling-Based Algorithms*.

Perez, Alejandro (MIT), Karaman, Sertac (Massachusetts Inst. of Tech.), Walter, Matthew (MIT), Shkolnik, Alexander (MIT), Frazzoli, Emilio (Massachusetts Inst. of Tech.), Teller, Seth (MIT)

14:45-16:15	ThCPT10.8

Quasi-Static Motion Planning on Uneven Terrain for a Wheeled Mobile Robot*.

Eathakota, Vijay (IIIT Hyderabad), Krishna, Madhava (IIIT Hyderabad), Gattupalli, Aditya (IIIT , Hyderabad)

14:45-16:15	ThCPT10.9

Minimum-Time Trajectories for Kinematic Mobile Robots and Other Planar Rigid Bodies with Finite Control Sets*.

Furtuna, Andrei (Dartmouth Coll.), Lu, Wenyu (Dartmouth Coll.), Wang, Weifu (Dartmouth Coll.), Balkcom, Devin (Dartmouth Coll.)

14:45-16:15	ThCPT10.10

Stochastic Optimization of a Chain Sliding Mode Controller for the Mobile Robot Maneuvering*.

Terekhov, Alexander V. (UPMC / CNRS), Mouret, Jean-Baptiste (Univ. Pierre et Marie Curie (UPMC)), Grand, Christophe (Univ. Pierre et Marie Curie)

14:45-16:15	ThCPT10.11

Programmable 3D Stochastic Fluidic Assembly of Cm-Scale Modules*.

Tolley, Michael Thomas (Harvard Univ.), Lipson, Hod (Cornell Univ.)

14:45-16:15	ThCPT10.12

Hierarchical Congestion Control for Robotic Swarms*.

Graciano Santos, Vinicius (Federal Univ. of Minas Gerais), Chaimowicz, Luiz (Federal Univ. of Minas Gerais)

14:45-16:15	ThCPT10.13

Humanoid Robot HRP-4 - Humanoid Robotics Platform with Lightweight and Slim Body - (I)*.

Kaneko, Kenji (National Inst. of AIST), Kanehiro, Fumio (National Inst. of AIST), Morisawa, Mitsuharu (National Inst. of AIST), Akachi, Kazuhiko (KAWADA INDUSTRIES,INC.), Miyamori, Go (Kawada Industries,Inc), Hayashi, Atsushi (Kawada Industries, Inc.), Kanehira, Noriyuki (Kawada Industries,Inc.)

14:45-16:15	ThCPT10.14

Weakly Collision-Free Paths for Continuous Humanoid Footstep Planning (I)*.

Perrin, Nicolas Yves (Univ. de Toulouse ; UPS, INSA, INP, ISAE ; LAAS), Stasse, Olivier (CNRS/AIST), Lamiraux, Florent (CNRS), Yoshida, Eiichi (National Inst. of AIST)

14:45-16:15	ThCPT10.15

Using a Multi-Objective Controller to Synthesize Simulated Humanoid Robot Motion with Changing Contact Configurations (I)*.

Bouyarmane, Karim (AIST), Kheddar, Abderrahmane (CNRS)

14:45-16:15	ThCPT10.16

Vehicle Detection and Tracking at Nighttime for Urban Autonomous Driving*.

Tehrani Nik Nejad, Hossein (Toyota Tech. Inst.), Takahashi, Koji (Toyota Tech. Inst.), Mita, Seiichi (Toyota Tech. Inst.), McAllester, David (Toyota Tech. Inst. at Chicago)

14:45-16:15	ThCPT10.17

Dense Multi-Planar Scene Estimation from a Sparse Set of Images*.

Argiles, Alberto (Univ. de Zaragoza), Civera, Javier (Univ. de Zaragoza), Montesano, Luis (Univ. de Zaragoza)

14:45-16:15	ThCPT10.18

Plenoptic Flow: Closed-Form Visual Odometry for Light Field Cameras*.

Dansereau, Donald Gilbert (Univ. of Sydney), Mahon, Ian (Univ. of Sydney), Pizarro, Oscar (Australian Centre for Field Robotics), Williams, Stefan Bernard (Univ. of Sydney)

14:45-16:15	ThCPT10.19

A Preliminary Experiment for Transferring Human Motion to a Musculoskeletal Robot - Decomposition of Human Running Based on Muscular Coordination -*.

Iimura, Taiki (Osaka Univ.), Inoue, Keita (Graduate school of engineering science of Osaka Univ.), Pham, Hang (Graduate School of Engineering Science, Osaka Univ.), Hirai, Hiroaki (Graduate School of Engineering Science, Osaka Univ.), Miyazaki, Fumio (Graduate School of Engineering Science, Osaka Univ.)

14:45-16:15	ThCPT10.20

Heart Motion Simulator for Motion Compensation*.

Iskakov, Renat (German Aerospace Center - DLR), Groeger, Martin (German Aerospace Center (DLR)), Hirzinger, Gerd (German Aerospace Center (DLR))

14:45-16:15	ThCPT10.21

MRI-Powered Actuators for Robotic Interventions*.

Vartholomeos, Panagiotis (Children's Hospital Boston , Harvard Medical School), Qin, Lei (Brigham and Women's Hospital, Harvard Medical School), Dupont, Pierre (Children's Hospital Boston, Harvard Medical School)

14:45-16:15	ThCPT10.22

Development of the High Strength Retractable Skin and the Closed Type Crawler Vehicle*.

Aoki, Takeshi (Chiba Inst. of Tech.), Karino, Takahiro (Chiba Inst. of Tech.), Kuwahara, Hiroyuki (SUSTAINable Robotics)

14:45-16:15	ThCPT10.23

Human-In-The-Loop: MPC for Shared Control of a Quadruped Rescue Robot*.

Chipalkatty, Rahul (Georgia Inst. of Tech.), Egerstedt, Magnus (Georgia Inst. of Tech.), Book, Wayne (Georgia Inst. of Tech.), Daepp, Hannes (Georgia Inst. of Tech.)

14:45-16:15	ThCPT10.24

Detection and Tracking of Road Networks in Rural Terrain by Fusing Vision and LIDAR*.

Manz, Michael (Univ. of the Bundeswehr Munich), Himmelsbach, Michael (Univ. of the Bundeswehr Munich), Luettel, Thorsten (Univ. of the Bundeswehr Muenchen), Wuensche, Hans J (UniBw Munich)

14:45-16:15	ThCPT10.25

Evaluation of Different Approaches for Road Course Estimation Using Imaging Radar*.

Sarholz, Frederik (Daimler AG), Mehnert, Jens (Daimler), Klappstein, Jens (Daimler AG), Dickmann, Jürgen (Daimler AG), Radig, Bernd (TU Muenchen)

14:45-16:15	ThCPT10.26

A Car Transportation System Using Multiple Mobile Robots: Icart II*.

Kashiwazaki, Koshi (Tohoku Univ.), Yonezawa, Naoaki (Tohoku Univ.), Endo, Mitsuru (Tohoku Univ.), Kosuge, Kazuhiro (Tohoku Univ.), Sugahara, Yusuke (Tohoku Univ.), Hirata, Yasuhisa (Tohoku Univ.), Kanbayashi, Takashi (Ishikawajima Transport Machinery Co. Ltd.), Suzuki, Kouki (Ishikawajima Transport Machinery Co. Ltd.), Murakami, Kazunori (Ishikawajima Transport Machinery Co. Ltd.), Nakamura, Kenichi (Ishikawajima Transport Machinery Co. Ltd.)

14:45-16:15	ThCPT10.27

Probabilistic Road Geometry Estimation Using a Millimetre-Wave Radar*.

Hernandez-Gutierrez, Andres (Univ. of Sydney, Australian Centre for Field Robotics), Nieto, Juan (Univ. of Sydney, Australian Centre for Field Robotics), Bailey, Tim (Univ. of Sydney), Nebot, Eduardo (Unversity of Sydney)

ThDT1	Continental Parlor 1
Climbing & Brachiation (Regular Session)	
Chair: Iida, Fumiya	ETH Zurich
Co-Chair: Yamamoto, Motoji	Kyushu Univ.

16:45-17:00	ThDT1.1

CLASH: Climbing Loose Vertical Cloth, pp. 5087-5093.

Birkmeyer, Paul (Univ. of California, Berkeley), Gillies, Andrew G (UC Berkeley), Fearing, Ronald (Univ. of California at Berkeley)

17:00-17:15	ThDT1.2

Shaping Energetically Efficient Brachiation Motion for a 24-DOF Gorilla Robot, pp. 5094-5099.

Pchelkin, Stepan (NTNU), Shiriaev, Anton (Norwegian Univ. of Science and Tech.), Mettin, Uwe (Norwegian Univ. of Science and Tech.), Freidovich, Leonid (Umeå Univ.), Aoyama, Tadayoshi (Nagoya Univ.), Lu, Zhiguo (Nagoya Univ.), Fukuda, Toshio (Nagoya Univ.)

17:15-17:30	ThDT1.3

Scaling Walls: Applying Dry Adhesives to the Real World, pp. 5100-5106.

Hawkes, Elliot Wright (Stanford Univ.), Ulmen, John (Stanford Univ.), Esparza, Noe (Stanford Univ.), Cutkosky, Mark (Stanford Univ.)

17:30-17:45	ThDT1.4

A Climbing Robot Based on Hot Melt Adhesion, pp. 5107-5112. Attachment

Osswald, Marc (Swiss Federal Inst. of Tech. Zurich), Iida, Fumiya (ETH Zurich)

ThDT2	Continental Parlor 2
Novel System Designs: Locomotion (Regular Session)	
Chair: Pierrot, François	CNRS - LIRMM
Co-Chair: Lin, Pei-Chun	National Taiwan Univ.

16:45-17:00	ThDT2.1

Shape and Location Design of Supporting Legs for a New Water Strider Robot, pp. 5061-5066. Attachment

Wu, Licheng (Minzu Univ. of China), Wang, Shuhui (Beihang Univ.), Ceccarelli, Marco (LARM, Univ. of Cassino), Yuan, Haiwen (Beihang Univ.), Yang, Guosheng (Coll. of Information Engineering, Minzu Univ. of China)

17:00-17:15	ThDT2.2

Locomotion Approach of REMORA: A REonfigurable MObile Robot

for Manufacturing Applications, pp. 5067-5072.

Yang, Hai (Tecnalia), Krut, Sebastien (LIRMM (CNRS & Univ. Montpellier 2)), Baradat, Cédric (Fondation Fatronik), Pierrot, François (CNRS - LIRMM)

17:15-17:30	ThDT2.3

HAMR3: An Autonomous 1.7g Ambulatory Robot, pp. 5073-5079. Attachment

Baisch, Andrew (Harvard Univ.), Heimlich, Christian (Ec. Pol. Fédérale de Lausanne EPFL), Karpelson, Michael (Harvard Univ.), Wood, Robert (Harvard Univ.)

17:30-17:45	ThDT2.4

Experimental Dynamics of Wing Assisted Running for a Bipedal Ornithopter, pp. 5080-5086. Attachment

Peterson, Kevin (Univ. of California, Berkeley), Fearing, Ronald (Univ. of California at Berkeley)

ThDT3	Continental Parlor 3
Marine Systems II (Regular Session)	
Chair: Rekleitis, Ioannis	McGill Univ.
Co-Chair: Ma, Shugen	Ritsumeikan Univ.

16:45-17:00	ThDT3.1

Epaddle Mechanism: Towards the Development of a Versatile Amphibious Locomotion Mechanism, pp. 5035-5040.

Sun, Yi (Ritsumeikan Univ.), Ma, Shugen (Ritsumeikan Univ.)

17:00-17:15	ThDT3.2

Generic Architecture for Multi-AUV Cooperation Based on a Multi-Agent Reactive Organizational Approach, pp. 5041-5047.

Carlési, Nicolas (LIRMM, Univ. Montpellier 2), Michel, Fabien (Univ. Montpellier II - CNRS), Jouvencel, Bruno (Univ. of Montpellier 2 - CNRS UMR5506 -LIRMM), Ferber, Jacques (LIRMM, Univ. Montpellier 2)

17:15-17:30	ThDT3.3

MARE: Marine Autonomous Robotic Explorer, pp. 5048-5053. Attachment

Girdhar, Yogesh (McGill Univ.), Xu, Anqi (McGill Univ.), Dey, Bir Bikram (Centre for Intelligent Machines, McGill Univ.), Meghjani, Malika (McGill Univ.), Shkurti, Florian (McGill Univ.), Rekleitis, Ioannis (McGill Univ.), Dudek, Gregory (McGill Univ.)

17:30-17:45	ThDT3.4

State Estimation of an Underwater Robot Using Visual and Inertial Information, pp. 5054-5060. Attachment

Shkurti, Florian (McGill Univ.), Rekleitis, Ioannis (McGill Univ.), Scaccia, Milena (School of Computer Science), Dudek, Gregory (McGill Univ.)

ThDT7	Continental Parlor 7
Medical Robotics: Motion Planning & State Estimation (Regular Session)	
Chair: Zinn, Michael	Univ. of Wisconsin - Madison
Co-Chair: Okamura, Allison M.	Stanford Univ.

16:45-17:00	ThDT7.1

A Modeling Approach for Continuum Robotic Manipulators: Effects of Nonlinear Internal Device Friction, pp. 5139-5146.

Jung, Jinwoo (Univ. of Wisconsin-Madison), Penning, Ryan (Univ. of Wisconsin-Madison), Ferrier, Nicola (Univ. of Wisconsin-Madison), Zinn, Michael (Univ. of Wisconsin - Madison)

17:00-17:15	ThDT7.2

Inequality Constrained Kalman Filtering for the Localization and Registration of a Surgical Robot, pp. 5147-5152.

Tully, Stephen (Carnegie Mellon Univ.), Kantor, George (Carnegie Mellon Univ.), Choset, Howie (Carnegie Mellon Univ.)

17:15-17:30	ThDT7.3

Motion Planning for Concentric Tube Robots Using Mechanics-Based Models, pp. 5153-5159.

Torres, Luis G. (Univ. of North Carolina at Chapel Hill), Alterovitz, Ron (Univ. of North Carolina at Chapel Hill)

17:30-17:45	ThDT7.4

State Estimation and Feedforward Tremor Suppression for a Handheld Micromanipulator with a Kalman Filter, pp. 5160-5165. Attachment

Becker, Brian C. (Carnegie Mellon Unversity), MacLachlan, Robert A. (Carnegie Mellon Univ.), Riviere, Cameron (Carnegie Mellon Univ.)

ThDT8	Continental Parlor 8
Aerial Robots (Regular Session)	
Chair: Beard, Randy	Brigham Young Univ.
Co-Chair: Schwager, Mac	Univ. of Pennsylvania

16:45-17:00	ThDT8.1

Design of a Flexible High Performance Quadcopter Platform Breaking the MAV Endurance Record with Laser Power Beaming, pp. 5166-5172. Attachment

Achtelik, Michael C. (Ascending Tech. GmbH), Stumpf, Jan Carsten (Ascending Tech. GmbH), Gurdan, Daniel (Ascending Tech. GmbH), Doth, Klaus-Michael (Ascending Tech. GmbH)

17:00-17:15	ThDT8.2

Utilizing an Improved Rotorcraft Dynamic Model in State Estimation, pp. 5173-5178.

Leishman, Robert (Brigham Young Univ.), Macdonald, John (Brigham Young Univ.), Ferrin, Jeffrey (Brigham Young Univ.), Quebe, Stephen (Brigham Young Univ.), Beard, Randy (Brigham Young Univ.), McLain, T.W. (Bringham Young Univ.)

17:15-17:30	ThDT8.3

Quadrocopter Performance Benchmarking Using Optimal Control, pp. 5179-5186. Attachment

Ritz, Robin (ETH Zürich), Hehn, Markus (ETH Zürich), Lupashin, Sergei (ETH Zurich), D'Andrea, Raffaello (ETHZ)

17:30-17:45	ThDT8.4

A Scalable Information Theoretic Approach to Distributed Robot Coordination (I), pp. 5187-5194. Attachment

Julian, Brian (MIT), Angermann, Michael (German Aerospace Center), Schwager, Mac (Univ. of Pennsylvania), Rus, Daniela (MIT)

ThDT9	Continental Parlor 9
Novel System Designs: Sensing and Manipulation (Regular Session)	
Chair: Madhavan, Raj	UMD-CP/NIST
Co-Chair: Han, Chang-Soo	Hanyang Univ.

16:45-17:00	ThDT9.1

Quadrocopter Ball Juggling, pp. 5113-5120. Attachment

Müller, Mark Wilfried (ETH Zurich), Lupashin, Sergei (ETH Zurich), D'Andrea, Raffaello (ETHZ)

17:00-17:15	ThDT9.2

2-DOF Contactless Distributed Manipulation Using Superposition of Induced Air Flows, pp. 5121-5126. Attachment

Delettre, Anne (FEMTO-ST Inst. - CNRS - ENSMM - Univ. de Franche-Comté), Laurent, Guillaume J. (FEMTO-ST Inst. - CNRS -

ENSMM - Univ. de Franche-Comté), Le Fort-Piat, Nadine (FEMTO-ST)

17:15-17:30	ThDT9.3

Compact Design of a Torque Sensor Using Optical Technique and Its Fabrication for Wearable and Quadrupt Robots, pp. 5127-5132.

Shams, Sarmad (Hanyang Univ.), Shin, Dongik (Hanyang Univ.), Han, Jungsoo (hansung Univ.), Lee, Ji Yeong Lee (Hanyang Univ. Ansan), Shin, Kyoosik (Hanyang Univ.), Han, Chang-Soo (Hanyang Univ.)

17:30-17:45	ThDT9.4

Development of a High Efficiency and High Reliable Glass Cleaning Robot with a Dirt Detect Sensor, pp. 5133-5138.

Katsuki, Yoshio (Kyushu Univ.), Ikeda, Takeshi (Kyushu Univ.), Yamamoto, Motoji (Kyushu Univ.)

ThDPT10	Golden Gate Room
Interactive XII (Interactive Session)	

16:45-17:45	ThDPT10.1

Learning Force Control Policies for Compliant Manipulation (I)*.

Kalakrishnan, Mrinal (Univ. of Southern California), Righetti, Ludovic (Univ. of Southern California), Pastor, Peter (Univ. of Southern California), Schaal, Stefan (Univ. of Southern California)

16:45-17:45	ThDPT10.2

Autonomous Indoor Aerial Gripping Using a Quadrotor (I)*.

Ghadiok, Vaibhav (Utah State Univ.), Goldin, Jeremy (Utah State Univ.), Ren, Wei (Utah State Univ.)

16:45-17:45	ThDPT10.3

Shooting Manipulation System with High Reaching Accuracy*.

Hatakeyama, Tomofumi (Univ. of Tsukuba), Mochiyama, Hiromi (Univ. of Tsukuba)

16:45-17:45	ThDPT10.4

Entropy-Based Motion Selection for Touch-Based Registration Using Rao-Blackwellized Particle Filtering*.

Taguchi, Yuichi (Mitsubishi Electric Res. Lab.), Marks, Tim K. (Mitsubishi Electric Res. Lab. (MERL)), Hershey, John R. (MERL)

16:45-17:45	ThDPT10.5

Manipulator System Selection Based on Evaluation of Task Completion Time and Cost*.

Huang, Yanjiang (The Res. into Artifacts, Center forEngineering,TheUniversity of Tokyo), Gueta, Lounell B. (Center for Engineering, Univ. of Tokyo), Chiba, Ryosuke (Tokyo Metropolitan Univ.), Arai, Tamio (The Univ. of Tokyo), Ueyama, Tsuyoshi (DENSO WAVE INCORPORATED), Ota, Jun (The Univ. of Tokyo)

16:45-17:45	ThDPT10.6

Modeling and Control of a Piezo-Actuated High-Dynamic Compensation Mechanism for Industrial Robots*.

Olofsson, Bjorn (Lund Univ.), Sornmo, Olof (Lund Univ.), Schneider, Ulrich (Fraunhofer IPA), Robertsson, Anders (LTH, Lund Univ.), Puzik, Arnold (Fraunhofer IPA), Johansson, Rolf (Lund Univ.)

16:45-17:45	ThDPT10.7

A Novel Propulsion Method of Flexible Underwater Robots*.

Shintake, Jun (The Univ. of Electro-Communications), Ming, Aiguo (The Univ. of Electro-Communications), Shimojo, Makoto (Univ. of Electro-COmmunications)

16:45-17:45	ThDPT10.8

On Adaptive Underwater Object Detection*.

Williams, David (NATO Undersea Res. Centre)

| 16:45-17:45 | ThDPT10.9 |

*Modeling, Simulation, and Performance of a Synergistically Propelled Ichthyoid**.

Strefling, Paul (Michigan State Univ.), Hellum, Aren (Michigan State Univ.), Mukherjee, Ranjan (Michigan State Univ.)

| 16:45-17:45 | ThDPT10.10 |

*Towards Language-Based Verification of Robot Behaviors (I)**.

Cowley, Anthony (Univ. of Pennsylvania), Taylor, Camillo Jose (Univ. of Pennsylvania)

| 16:45-17:45 | ThDPT10.11 |

*Self-Assembly of Modular Robots from Finite Number of Modules Using Graph Grammars (I)**.

Rai, Vijeth (Univ. of Colorado, Boulder), van Rossum, Anne (Almende B.V.), Correll, Nikolaus (Univ. of Colorado at Boulder)

| 16:45-17:45 | ThDPT10.12 |

*Constrained Task Partitioning for Distributed Assembly (I)**.

Worcester, James (Drexel Univ.), Rogoff, Joshua (Drexel Univ.), Hsieh, M. Ani (Drexel Univ.)

| 16:45-17:45 | ThDPT10.13 |

*Combined Intention, Activity, and Motion Recognition for a Humanoid Household Robot**.

Gehrig, Dirk (Karlsruhe Inst. of Tech.), Krauthausen, Peter (Karlsruhe Inst. of Tech.), Rybok, Lukas (Karlsruhe Inst. of Tech. (KIT)), Kuehne, Hildegard (Insitute for Anthropomatics, Karlsruhe Inst. of Tech.), Hanebeck, Uwe D. (Karlsruhe Inst. of Tech. (KIT)), Schultz, Tanja (Univ. of Karlsruhe), Stiefelhagen, Rainer (Karlsruhe Inst. of Tech.)

| 16:45-17:45 | ThDPT10.14 |

*An Expected Perception Architecture Using Visual 3D Reconstruction for a Humanoid Robot**.

Moutinho, Nuno (Inst. Superior Técnico), Cauli, Nino (Scuola Superiore Sant'Anna, Italy), Falotico, Egidio (Scuola Superiore Sant'Anna), Ferreira, Ricardo (Inst. Superior Técnico), Gaspar, Jose (Inst. Superior Técnico - Inst. for Systems and Robotics), Bernardino, Alexandre (Inst. Superior Técnico - Inst. for Systems and Robotics), Santos-Victor, José (Inst. Superior Técnico - Inst. for Systems and Robotics), Dario, Paolo (Scuola Superiore Sant'Anna), Laschi, Cecilia (Scuola Superiore Sant'Anna)

| 16:45-17:45 | ThDPT10.15 |

*Multilayer Control of Skiing Robot**.

Petric, Tadej (Jozef Stefan Inst.), Nemec, Bojan (Jozef Stefan Inst.), Babic, Jan (Jozef Stefan Inst.), Žlajpah, Leon (Jožef Stefan Inst.)

| 16:45-17:45 | ThDPT10.16 |

*Online Learning for Automatic Segmentation of 3D Data**.

Tombari, Federico (Univ. of Bologna), Di Stefano, Luigi (Univ. of Bologna), Giardino, Simone (Univ. of Bologna)

| 16:45-17:45 | ThDPT10.17 |

*Shape-Based Depth Image to 3D Model Matching and Classification with Inter-View Similarity**.

Wohlkinger, Walter (Vienna Univ. of Tech. (VUT)), Vincze, Markus (Vienna Univ. of Tech.)

| 16:45-17:45 | ThDPT10.18 |

*Model for Unfolding Laundry Using Interactive Perception**.

Willimon, Bryan (Clemson Univ.), Birchfield, Stan (Clemson Univ.), Walker, Ian (Clemson Univ.)

| 16:45-17:45 | ThDPT10.19 |

*The Development and Testing of a Human Machine Interface for a Mobile Medical Exoskeleton**.

Strausser, Katherine (Univ. of California, Berkeley), Kazerooni,

Homayoon (Univ. of California at Berkeley)

| 16:45-17:45 | ThDPT10.20 |

*A Self-Adjusting Knee Exoskeleton for Robot-Assisted Treatment of Knee Injuries**.

Ergin, Mehmet Alper (Sabanci Univ.), Patoglu, Volkan (Sabanci Univ.)

| 16:45-17:45 | ThDPT10.21 |

*Study of Body Weight Shifting on Robotic Assisted Gait Rehabilitation with NaTUre-Gaits**.

Lim, Hup Boon (Nanyang Tech. Univ.), Luu, Trieu Phat (Nanyang Tech. Univ.), Hoon, Kay Hiang (Nanyang Tech. Univ.), Qu, Xingda (Nanyang Tech. Univ.), Tow, Adela (Tan Tock Seng Hospital), Low, K. H. (Nanyang Tech. Univ.)

| 16:45-17:45 | ThDPT10.22 |

*Efficient Target Geolocation by Highly Uncertain Small Air Vehicles**.

Grocholsky, Ben (Carnegie Mellon Univ.), Dille, Michael (Carnegie Mellon Univ.), Nuske, Stephen (CMU Robotics Inst.)

| 16:45-17:45 | ThDPT10.23 |

*Beyond Visual Range Obstacle Avoidance and Infrastructure Inspection by an Autonomous Helicopter**.

Merz, Torsten (CSIRO), Kendoul, Farid (Australian Commonwealth Scientific and Res. (CSIRO))

| 16:45-17:45 | ThDPT10.24 |

*Coordinated Landing of a Quadrotor on a Skid-Steered Ground Vehicle in the Presence of Time Delays**.

Daly, John Michael (Univ. of Waterloo), Ma, Yan (Univ. of Waterloo), Waslander, Steven Lake (Univ. of Waterloo)

| 16:45-17:45 | ThDPT10.25 |

*Flocking: Don't Need No Stinkin' Robot Recognition**.

Fine, Benjamin (Texas A&M Univ.), Shell, Dylan (Texas A&M Univ.)

| 16:45-17:45 | ThDPT10.26 |

*Gas Source Localization in Indoor Environments Using Multiple Inexpensive Robots and Stigmergy**.

Di Rocco, Maurizio (Univ. di Roma Tre), Saffiotti, Alessandro (Orebro Univ.), Reggente, Matteo (AASS Res. Center - Learning Systems Lab.)

| 16:45-17:45 | ThDPT10.27 |

*Reynolds Flocking in Reality with Fixed-Wing Robots: Communication Range vs. Maximum Turning Rate**.

Hauert, Sabine (EPFL), Leven, Severin (Ec. Pol. Federale de Lausanne), Varga, Maja (Univ. of Zagreb, Faculty of Electrical Engineering and Computing), Ruini, Fabio (Univ. of Plymouth), Cangelosi, Angelo (Univ. of Plymouth, UK), Zufferey, Jean-Christophe (EPFL), Floreano, Dario (Ec. Pol. Federal, Lausanne)