

2016 IEEE-RAS 16th international Conference on Humanoid Robots (Humanoids 2016)

**Cancun, Mexico
15-17 November 2016**

Pages 1-655



**IEEE Catalog Number: CFP16HUM-POD
ISBN: 978-1-5090-4719-2**

**Copyright © 2016 by the Institute of Electrical and Electronics Engineers, Inc
All Rights Reserved**

Copyright and Reprint Permissions: Abstracting is permitted with credit to the source. Libraries are permitted to photocopy beyond the limit of U.S. copyright law for private use of patrons those articles in this volume that carry a code at the bottom of the first page, provided the per-copy fee indicated in the code is paid through Copyright Clearance Center, 222 Rosewood Drive, Danvers, MA 01923.

For other copying, reprint or republication permission, write to IEEE Copyrights Manager, IEEE Service Center, 445 Hoes Lane, Piscataway, NJ 08854. All rights reserved.

******This publication is a representation of what appears in the IEEE Digital Libraries. Some format issues inherent in the e-media version may also appear in this print version.***

IEEE Catalog Number:	CFP16HUM-POD
ISBN (Print-On-Demand):	978-1-5090-4719-2
ISBN (Online):	978-1-5090-4718-5
ISSN:	2164-0572

Additional Copies of This Publication Are Available From:

Curran Associates, Inc
57 Morehouse Lane
Red Hook, NY 12571 USA
Phone: (845) 758-0400
Fax: (845) 758-2633
E-mail: curran@proceedings.com
Web: www.proceedings.com

CURRAN ASSOCIATES INC.
proceedings
.com

TABLE OF CONTENTS

THE TASKS PRIORITY MATRIX: A NEW TOOL FOR HIERARCHICAL REDUNDANCY RESOLUTION	1
<i>Fabrizio Flacco</i>	
BALANCE CONTROL USING CENTER OF MASS HEIGHT VARIATION: LIMITATIONS IMPOSED BY UNILATERAL CONTACT	8
<i>Twan Koolen ; Michael Posa ; Russ Tedrake</i>	
ACCELERATING WHOLE-BODY MOTION GENERATION USING REGRESSION OF THE TORSO POSTURE OF A HUMANOID ROBOT	16
<i>Satoki Tsuchihiro ; Yuya Hakamata ; Gustavo Alfonso Garcia Ricardez ; Jun Takamatsu ; Tsukasa Ogasawara</i>	
SAMPLE EFFICIENT OPTIMIZATION FOR LEARNING CONTROLLERS FOR BIPEDAL LOCOMOTION	22
<i>Rika Antonova ; Akshara Rai ; Christopher G. Atkeson</i>	
IMPROVEMENT OF HUMANOID WALKING CONTROL BY COMPENSATING ACTUATOR ELASTICITY	29
<i>Jeeseop Kim ; Mingon Kim ; Jaeheung Park</i>	
STEP TIMING ADJUSTMENT: A STEP TOWARD GENERATING ROBUST GAITS	35
<i>Majid Khadiv ; Alexander Herzog ; S. Ali. A. Moosavian ; Ludovic Righetti</i>	
EFFICIENT WHOLE-BODY TRAJECTORY OPTIMIZATION USING CONTACT CONSTRAINT RELAXATION	43
<i>Michael Neunert ; Farbod Farshidian ; Jonas Buchli</i>	
THREE-DIMENSIONAL HUMANOID MOTION PLANNING USING COM FEASIBLE REGION AND ITS APPLICATION TO LADDER CLIMBING TASKS	49
<i>Shunichi Nozawa ; Masao Kanazawa ; Yohei Kakiuchi ; Kei Okada ; Takahide Yoshiike ; Masayuki Inaba</i>	
BIPED WALKING AND STAIRS CLIMBING USING RECONFIGURABLE ADAPTIVE MOTION PRIMITIVES	57
<i>Mirko Raković ; Branislav Borovac ; José Santos-Victor ; Aleksandar Batinica ; Milutin Nikolić ; Srdan Savić</i>	
BALANCING AND WALKING USING FULL DYNAMICS LQR CONTROL WITH CONTACT CONSTRAINTS	63
<i>Sean Mason ; Nicholas Rotella ; Stefan Schaal ; Ludovic Righetti</i>	
REAL-TIME FOOTSTEP PLANNING IN 3D ENVIRONMENTS	69
<i>Philipp Karkowski ; Stefan Oßwald ; Maren Bennewitz</i>	
OMNIDIRECTIONAL HUMANOID NAVIGATION IN CLUTTERED ENVIRONMENTS BASED ON OPTICAL FLOW INFORMATION	75
<i>Marco Ferro ; Antonio Paolillo ; Andrea Cherubini ; Marilena Vendittelli</i>	
MATERIAL RECOGNITION CNNs AND HIERARCHICAL PLANNING FOR BIPED ROBOT LOCOMOTION ON SLIPPERY TERRAIN	81
<i>Martim Brandão ; Yukitoshi Minami Shiguematsu ; Kenji Hashimoto ; Atsuo Takanishi</i>	
WHOLE BODY CONTROL OF A WHEELED INVERTED PENDULUM HUMANOID	89
<i>Munzir Zafar ; Henrik I. Christensen</i>	
WHOLE BODY MOTION GENERATION OF A HUMANOID ROBOT USING A PREDIFINED REACTION FORCE	95
<i>Yuya Hakamata ; Satoki Tsuchihiro ; Jun Takamatsu ; Tsukasa Ogasawara</i>	
LEARNING SOFT TASK PRIORITIES FOR SAFE CONTROL OF HUMANOID ROBOTS WITH CONSTRAINED STOCHASTIC OPTIMIZATION	101
<i>Valerio Modugno ; Ugo Chervet ; Giuseppe Oriolo ; Serena Ivaldi</i>	
ENRICHED MANIPULATION ACTION SEMANTICS FOR ROBOT EXECUTION OF TIME CONSTRAINED TASKS	109
<i>Eren Erdal Aksoy ; You Zhou ; Mirko Wächter ; Tamim Asfour</i>	
COMBINING SENSORY MODALITIES AND EXPLORATORY PROCEDURES TO IMPROVE HAPTIC OBJECT RECOGNITION IN ROBOTICS	117
<i>Bertrand Higy ; Carlo Ciliberto ; Lorenzo Rosasco ; Lorenzo Natale</i>	
INTEGRATED AFFORDANCE DETECTION AND HUMANOID LOCOMOTION PLANNING	125
<i>Will Pryor ; Yu-Chi Lin ; Dmitry Berenson</i>	
TERRAIN CLASSIFICATION AND LOCOMOTION PARAMETERS ADAPTATION FOR HUMANOID ROBOTS USING FORCE/TORQUE SENSING	133
<i>Krzysztof Walas ; Dimitrios Kanoulas ; Przemysław Kryczka</i>	
HIGHLY DYNAMIC BALANCING VIA FORCE CONTROL	141
<i>Daniele Pucci ; Francesco Romano ; Silvio Traversaro ; Francesco Nori</i>	
LEARNING HUMAN-ROBOT INTERACTIONS FROM HUMAN-HUMAN DEMONSTRATIONS (WITH APPLICATIONS IN LEGO ROCKET ASSEMBLY)	142
<i>David Vogt ; Simon Stepputtis ; Richard Weinhold ; Bernhard Jung ; Heni Ben Amor</i>	
FEASIBILITY STUDY OF A NOVEL ROBOTIC SYSTEM BALLU: BUOYANCY ASSISTED LIGHTWEIGHT LEGGED UNIT	144
<i>Sepehr Ghassemi ; Dennis Hong</i>	
FEASIBILITY STUDY OF A NOVEL BIPED NABIROS: NON ANTHROPOMORPHIC BIPEDAL ROBOTIC SYSTEM	145
<i>Sepehr Ghassemi ; Jeffrey Yu ; Joshua Hooks ; Dennis Hong</i>	

STABLE BIPEDAL FOOT PLANTING ON UNEVEN TERRAIN THROUGH OPTIMAL ANKLE IMPEDANCE.....	146
<i>Francesco Romano ; Naveen Kuppuswamy ; Matteo Ciocca ; Silvio Traversaro ; Francesco Nori</i>	
TORQUE-CONTROLLED STEPPING-STRATEGY PUSH RECOVERY: DESIGN AND IMPLEMENTATION ON THE ICUB HUMANOID ROBOT.....	152
<i>Stefano Dafarra ; Francesco Romano ; Francesco Nori</i>	
AUTOMATIC GAIN TUNING OF A MOMENTUM BASED BALANCING CONTROLLER FOR HUMANOID ROBOTS.....	158
<i>Daniele Pucci ; Gabriele Nava ; Francesco Nori</i>	
WHAT AM I DOING? ROBOTIC SELF-ACTION RECOGNITION	165
<i>Zijia Li ; Chi Wun Au ; Yohei Kakiuchi ; Kei Okada ; Masayuki Inaba</i>	
ANALYSIS OF THE INERTIA AND DYNAMICS OF GRASPED OBJECTS, FOR CHOOSING OPTIMAL GRASPS TO ENABLE TORQUE-EFFICIENT POST-GRASP MANIPULATIONS.....	171
<i>Nikos Mavrakis ; Amir M. Ghalamzan ; Rustam Stolkin ; Luca Baronti ; Marek Kopicki ; Marco Castellani</i>	
ACTIVE PERCEPTION: BUILDING OBJECTS' MODELS USING TACTILE EXPLORATION	179
<i>Nawid Jamali ; Carlo Ciliberto ; Lorenzo Rosasco ; Lorenzo Natale</i>	
TEMPORAL ARM TRACKING AND PROBABILISTIC POINTED OBJECT SELECTION FOR ROBOT TO ROBOT INTERACTION USING DEICTIC GESTURES	186
<i>Polychronis Kondaxakis ; Khurram Gulzar ; Ville Kyrki</i>	
REINFORCEMENT LEARNING FOR IMPROVING IMITATED IN-CONTACT SKILLS.....	194
<i>Murtaza Hazara ; Ville Kyrki</i>	
NON-LINEAR ZMP BASED STATE ESTIMATION FOR HUMANOID ROBOT LOCOMOTION.....	202
<i>Stylianos Piperakis ; Panos Trahanias</i>	
BIMANUAL FOLDING ASSEMBLY: SWITCHED CONTROL AND CONTACT POINT ESTIMATION	210
<i>Diogo Almeida ; Francisco E. Viña ; Yiannis Karayiannidis</i>	
INTRINSIC TACTILE SENSING SYSTEM DESIGN FOR ROBOTICS MANIPULATION.....	217
<i>Andres Ospina ; Saïfeddine Aloui ; Mathieu Grossard ; Alain Micaelli</i>	
INCREMENTAL BOOTSTRAPPING OF PARAMETERIZED MOTOR SKILLS.....	223
<i>Jeffrey Frederic Queißer ; René Felix Reinhart ; Jochen Jakob Steil</i>	
DEVELOPMENT OF AN ASSISTIVE SYSTEM FOR POSITION CONTROL OF A HUMAN HAND WITH HIGH SPEED AND HIGH ACCURACY	230
<i>Wataru Tooyama ; Shouren Huang ; Kenichi Murakami ; Yuji Yamakawa ; Masatoshi Ishikawa</i>	
VIBRATION SUPPRESSION BASED ON INPUT SHAPING FOR BIPED WALKING	236
<i>Jiang Yi ; Qiuguo Zhu ; Rong Xiong ; Jun Wu</i>	
PANORAMIC VIEW RECONSTRUCTION FOR STEREOSCOPIC TELEOPERATION OF A HUMANOID ROBOT	242
<i>Konstantinos Theofilis ; Jason Orlosky ; Yukie Nagai ; Kiyoshi Kiyokawa</i>	
ROBOT CONTACT TASK STATE ESTIMATION VIA POSITION-BASED ACTION GRAMMARS	249
<i>Juan Rojas ; Zhenjie Huang ; Kensuke Harada</i>	
A NOVEL BAYESIAN FILTERING APPROACH TO TACTILE OBJECT RECOGNITION	256
<i>G. Vezzani ; N. Jamali ; U. Pattacini ; G. Battistelli ; L. Chisci ; L. Natale</i>	
CONTINUOUS TASK-PRIORITY REARRANGEMENT DURING MOTION EXECUTION WITH A MIXTURE OF TORQUE CONTROLLERS.....	264
<i>Niels Dehio ; René Felix Reinhart ; Jochen J. Steil</i>	
IDRM: HUMANOID MOTION PLANNING WITH REALTIME END-POSE SELECTION IN COMPLEX ENVIRONMENTS.....	271
<i>Yiming Yang ; Vladimir Ivan ; Zhibin Li ; Maurice Fallon ; Sethu Vijayakumar</i>	
GUIDING HUMAN MOTIONS IN PHYSICAL HUMAN-ROBOT INTERACTION THROUGH COM MOTION CONTROL OF A DANCE TEACHING ROBOT	279
<i>Diego Felipe Paez Granados ; Jun Kinugawa ; Yasuhisa Hirata ; Kazuhiro Kosuge</i>	
VISION-BASED MANIPULATION WITH THE HUMANOID ROBOT ROMEO.....	286
<i>Giovanni Claudio ; Fabien Spindler ; François Chaumette</i>	
WHOLE-BODY MOTION RETARGETING USING CONSTRAINED SMOOTHING AND FUNCTIONAL PRINCIPLE COMPONENT ANALYSIS	294
<i>Saori Morishima ; Ko Ayusawa ; Eiichi Yoshida ; Gentiane Venture</i>	
EFFECTIVE REWARD FUNCTION IN DISCERNMENT BEHAVIOR REINFORCEMENT LEARNING BASED ON CATEGORIZATION PROGRESS	300
<i>Chyon Hae Kim ; Yusuke Kon ; Ricardo Navarro ; Manabu Gouko ; Yuichi Kobayashi</i>	
GENERAL RECOGNITION MODELS CAPABLE OF INTEGRATING MULTIPLE SENSORS FOR DIFFERENT DOMAINS.....	306
<i>Karinne Ramirez-Amaro ; Emmanuel Dean-Leon ; Ilya Dianov ; Florian Bergner ; Gordon Cheng</i>	
DESIGN STRATEGY FOR ROBOTIC SPINES OF ANDROIDS WITH A NATURAL POSTURAL APPEARANCE.....	312
<i>Andrei S. Ramalho ; Yutaka Nakamura ; Yoshihiro Nakata ; Hiroshi Ishiguro</i>	
IS HUGGING A ROBOT WEIRD? INVESTIGATING THE INFLUENCE OF ROBOT APPEARANCE ON USERS' PERCEPTION OF HUGGING	318
<i>Gabriele Trovato ; Martin Do ; Ömer Terlemez ; Christian Mandery ; Hiroyuki Ishii ; Nadia Bianchi-Berthouze ; Tamim Asfour ; Atsuo Takanishi</i>	
A HUMAN-INSPIRED CONTROLLER FOR FLUID HUMAN-ROBOT HANDOVERS.....	324
<i>José R. Medina ; Felix Duvallet ; Murali Karnam ; Aude Billard</i>	

MINSTREL ROBOTS: BODY LANGUAGE EXPRESSION THROUGH APPLAUSE EVALUATION	332
<i>F. Kraemer ; I. Rodriguez ; O. Parra ; T. Ruiz ; E. Lazkano</i>	
BIOLOGICAL MOVEMENT DETECTOR ENHANCES THE ATTENTIVE SKILLS OF HUMANOID ROBOT ICUB	338
<i>Alessia Vignolo ; Francesco Rea ; Nicoletta Noceti ; Alessandra Sciutti ; Francesca Odone ; Giulio Sandini</i>	
COOPERATIVE HUMAN-ROBOT CONTROL BASED ON FITTS' LAW	345
<i>Tadej Petrič ; Rok Goljat ; Jan Babič</i>	
INCREMENTAL IMITATION LEARNING OF CONTEXT-DEPENDENT MOTOR SKILLS.....	351
<i>Marco Ewerton ; Guilherme Maeda ; Gerrit Kollegger ; Josef Wiemeyer ; Jan Peters</i>	
UNCERTAINTY ANALYSIS FOR CURVED SURFACE CONTACT PATCHES.....	359
<i>Dimitrios Kanoulas ; Nikos G. Tsagarakis ; Marsette Vona</i>	
EXTERNAL FORCE OBSERVER FOR MEDIUM-SIZED HUMANOID ROBOTS.....	366
<i>Louis Hawley ; Wael Suleiman</i>	
CO-ACTIVE LEARNING TO ADAPT HUMANOID MOVEMENT FOR MANIPULATION.....	372
<i>Ren Mao ; John S. Baras ; Yezhou Yang ; Cornelia Fermüller</i>	
SAFE NAVIGATION STRATEGIES FOR A BIPED ROBOT WALKING IN A CROWD	379
<i>Néstor Bohorquez ; Alexander Sherikov ; Dimitar Dimitrov ; Pierre-Brice Wieber</i>	
HIERARCHICAL GRASP CONTROLLER USING TACTILE FEEDBACK	387
<i>Massimo Regoli ; Ugo Pattacini ; Giorgio Metta ; Lorenzo Natale</i>	
DYNAMIC HEEL-STRIKE TOE-OFF WALKING CONTROLLER FOR FULL-SIZE MODULAR HUMANOID ROBOTS.....	395
<i>Seung-Joon Yi ; Daniel D. Lee</i>	
ENABLING A TELEOPERATED HUMANOID ROBOT TO PASS THROUGH DEBRIS-FILLED TERRAIN USING MANIPULATION	401
<i>Rafael Cisneros ; Mitsuharu Morisawa ; Shin'ichiro Nakaoka ; Kenji Kaneko ; Shuuji Kajita ; Takeshi Sakaguchi ; Fumio Kanehiro</i>	
RESIDUAL-BASED CONTACTS ESTIMATION FOR HUMANOID ROBOTS	409
<i>Fabrizio Flacco ; Antonio Paolillo ; Abderrahmane Kheddar</i>	
LEARNING A TOOL'S HOMOGENEOUS TRANSFORMATION BY TACTILE-BASED INTERACTION.....	416
<i>Qiang Li ; Robert Haschke ; Helge Ritter</i>	
MODEL BASED IN SITU CALIBRATION OF SIX AXIS FORCE TORQUE SENSORS.....	422
<i>Francisco Javier Andrade Chavez ; Silvio Traversaro ; Daniele Pucci ; Francesco Nori</i>	
FRICITION FROM VISION: A STUDY OF ALGORITHMIC AND HUMAN PERFORMANCE WITH CONSEQUENCES FOR ROBOT PERCEPTION AND TELEOPERATION	428
<i>Martim Brandão ; Kenji Hashimoto ; Atsuo Takanishi</i>	
DYNAMICALLY CONSISTENT INVERSE KINEMATICS FRAMEWORK USING OPTIMIZATIONS FOR HUMAN MOTION ANALYSIS	436
<i>S. Futamura ; V. Bonnet ; R. Dumas ; D. Kulic ; G. Venture</i>	
MODEL ESTIMATION AND CONTROL OF COMPLIANT CONTACT NORMAL FORCE	442
<i>Morteza Azad ; Valerio Ortenzi ; Hsiu-Chin Lin ; Elmar Rueckert ; Michael Mistry</i>	
COLLABORATION OF HETEROGENEOUS AGENTS IN TIME CONSTRAINED TASKS	448
<i>Michail Maniadakis ; Eren Erdal Aksoy ; Tamim Asfour ; Panos Trahanias</i>	
A MODULAR, DISTRIBUTED, SOFT, 3-AXIS SENSOR SYSTEM FOR ROBOT HANDS.....	454
<i>Tito Pradhono Tomo ; Wai Keat Wong ; Alexander Schmitz ; Harris Kristanto ; Alexandre Sarazin ; Lorenzo Jamone ; Sophon Somlor ; Shigeki Sugano</i>	
INFERRING THE EFFECTS OF WIPING MOTIONS BASED ON HAPTIC PERCEPTION	461
<i>Daniel Leidner ; Michael Beetz</i>	
BIRRTOPT: A COMBINED SAMPLING AND OPTIMIZING MOTION PLANNER FOR HUMANOID ROBOTS.....	469
<i>Lening Li ; Xianchao Long ; Michael A. Gennert</i>	
A NEURO-BASED METHOD FOR DETECTING CONTEXT-DEPENDENT ERRONEOUS ROBOT ACTION	477
<i>Stefan Ehrlich ; Gordon Cheng</i>	
BALANCE CONTROL FOR AN UNDERACTUATED LEG EXOSKELETON BASED ON CAPTURE POINT CONCEPT AND HUMAN BALANCE STRATEGIES.....	483
<i>Vaiyee Huynh ; Catherine Bidard ; Chistine Chevallereau</i>	
ADAPTATION OF ROBOT PHYSICAL BEHAVIOUR TO HUMAN FATIGUE IN HUMAN-ROBOT CO-MANIPULATION.....	489
<i>Luka Peternel ; Nikos Tsagarakis ; Darwin Caldwell ; Arash Ajoudani</i>	
EXERCISING WITH A HUMANOID COMPANION IS MORE EFFECTIVE THAN EXERCISING ALONE	495
<i>Sebastian Schneider ; Franz Kümmert</i>	
USING PROBABILISTIC MOVEMENT PRIMITIVES FOR STRIKING MOVEMENTS.....	502
<i>Sebastian Gomez-Gonzalez ; Gerhard Neumann ; Bernhard Schölkopf ; Jan Peters</i>	
EXPLOITING HUMAN WALKING SPEED TRANSITIONS USING A DYNAMIC BIPEDAL WALKING ROBOT WITH CONTROLLABLE STIFFNESS AND LIMB COORDINATION	509
<i>Yan Huang ; Baojun Chen ; Libo Meng ; Zhangguo Yu ; Xuechao Chen ; Qiang Huang ; Qining Wang</i>	
DEMONSTRATION BASED TRAJECTORY OPTIMIZATION FOR GENERALIZABLE ROBOT MOTIONS	515
<i>Dorothea Koert ; Guilherme Maeda ; Rudolf Lioutikov ; Gerhard Neumann ; Jan Peters</i>	
DESIGN OF A HIGH-PERFORMANCE HUMANOID DUAL ARM SYSTEM WITH INNER SHOULDER JOINTS.....	523
<i>Samuel Rader ; Lukas Kaul ; Hennes Fischbach ; Nikolaus Vahrenkamp ; Tamim Asfour</i>	

ACTIVE PERCEPTION AND MODELING OF DEFORMABLE SURFACES USING GAUSSIAN PROCESSES AND POSITION-BASED DYNAMICS	530
<i>Sergio Caccamo ; Püren Güler ; Hedvig Kjellström ; Danica Kragic</i>	
ROBUST STABILIZATION OF A FULLY ACTUATED 3D BIPEDAL LOCOMOTION VIA NONLINEAR H_∞-CONTROL UNDER UNILATERAL CONSTRAINTS	538
<i>Oscar Montano ; Yury Orlov ; Yannick Aoustin ; Christine Chevallereau</i>	
TRAJECTORY LEARNING FROM DEMONSTRATION WITH CANAL SURFACES: A PARAMETER-FREE APPROACH	544
<i>S. Reza Ahmadzadeh ; Roshni Kaushik ; Sonia Chernova</i>	
MULTI-CONTACT WALKING PATTERN GENERATION BASED ON MODEL PREVIEW CONTROL OF 3D COM ACCELERATIONS	550
<i>Stéphane Carón ; Abderrahmane Kheddar</i>	
PERCEPTION-LESS TERRAIN ADAPTATION THROUGH WHOLE BODY CONTROL AND HIERARCHICAL OPTIMIZATION	558
<i>C. Dario Bellicoso ; Christian Gehring ; Jemin Hwangbo ; Péter Fankhauser ; Marco Hutter</i>	
A METHODOLOGICAL FRAMEWORK FOR ROBOTIC REPRODUCTION OF OBSERVED HUMAN ACTIONS: FORMULATION USING LATENT SPACE REPRESENTATION	565
<i>Maria Koskinopoulou ; Panos Trahanias</i>	
REAL-TIME IMAGE TEMPLATE MATCHING ALGORITHM BASED ON DIFFERENTIAL EVOLUTION	573
<i>Carlos López-Franco ; Jesús Hernández-Barragán ; Michel Lopez-Franco ; Margarita Reynoso ; Emmanuel Nuño ; Adriana López-Franco</i>	
PLANNING ROBUST WALKING MOTION ON UNEVEN TERRAIN VIA CONVEX OPTIMIZATION	579
<i>Hongkai Dai ; Russ Tedrake</i>	
A PARAMETERIZED FAMILY OF ANATOMICALLY ACCURATE HUMAN UPPER-BODY MUSCULOSKELETAL MODELS FOR DYNAMIC SIMULATION & CONTROL	587
<i>Samir Menon ; Toki Migimatsu ; Oussama Khatib</i>	
A HUMANOID ROBOT TOYING A SPINNING TOP: ANALYSIS AND DESIGN	595
<i>M. Guzman-Alvarado ; G. Guzman-Solis ; J. Obregon ; J. Hernandez-Tuyin ; V. Parra-Vega ; E. Olguín-Díaz ; R. Garcia-Rodriguez</i>	
INTRINSICALLY STABLE MPC FOR HUMANOID GAIT GENERATION	601
<i>Nicola Scianca ; Marco Cagnetti ; Daniele De Simone ; Leonardo Lanari ; Giuseppe Oriolo</i>	
BIMANUAL HUMAN ROBOT COOPERATION WITH ADAPTIVE STIFFNESS CONTROL	607
<i>Bojan Nemec ; Nejc Likar ; Andrej Gams ; Aleš Ude</i>	
TRANSFORMABLE SEMANTIC MAP BASED NAVIGATION USING AUTONOMOUS DEEP LEARNING OBJECT SEGMENTATION	614
<i>Yuki Furuta ; Kentaro Wada ; Masaki Murooka ; Shunichi Nozawa ; Yohei Kakiuchi ; Kei Okada ; Masayuki Inaba</i>	
AN AFFORDANCE-BASED PILOT INTERFACE FOR HIGH-LEVEL CONTROL OF HUMANOID ROBOTS IN SUPERVISED AUTONOMY	621
<i>Peter Kaiser ; Dimitrios Kanoulas ; Markus Grotz ; Luca Muratore ; Alessio Rocchi ; Enrico Mingo Hoffman ; Nikos G. Tsagarakis ; Tamim Asfour</i>	
DYNAMIC MOVEMENT PRIMITIVES IN LATENT SPACE OF TIME-DEPENDENT VARIATIONAL AUTOENCODERS	629
<i>Nutan Chen ; Maximilian Karl ; Patrick van der Smagt</i>	
IMPACT ACCELERATION OF FALLING HUMANOID ROBOT WITH AN AIRBAG	637
<i>Shuuji Kajita ; Rafael Cisneros ; Mehdi Benallegue ; Takeshi Sakaguchi ; Shin'ichiro Nakaoka ; Mitsuharu Morisawa ; Kenji Kaneko ; Fumio Kanehiro</i>	
TEACHING NUTRITION AND HEALTHY EATING BY USING MULTIMEDIA WITH A KOMPAI ROBOT: EFFECTS OF STRESS AND USER'S PERSONALITY	644
<i>Arturo Cruz-Maya ; Adriana Tapus</i>	
JOINTLY LEARNING TRAJECTORY GENERATION AND HITTING POINT PREDICTION IN ROBOT TABLE TENNIS	650
<i>Yanlong Huang ; Dieter Büchler ; Okan Koç ; Bernhard Schölkopf ; Jan Peters</i>	
DEEP SPIKING NETWORKS FOR MODEL-BASED PLANNING IN HUMANOIDS	656
<i>Daniel Tanneberg ; Alexandros Paraschos ; Jan Peters ; Elmar Rueckert</i>	
KERNEL DYNAMIC POLICY PROGRAMMING: PRACTICAL REINFORCEMENT LEARNING FOR HIGH-DIMENSIONAL ROBOTS	662
<i>Yunduan Cui ; Takamitsu Matsubara ; Kenji Sugimoto</i>	
TRANSFER OF CONTACT SKILLS TO NEW ENVIRONMENTAL CONDITIONS	668
<i>Aljaž Kramberger ; Andrej Gams ; Bojan Nemec ; Casper Schou ; Dimitrios Chrysostomou ; Ole Madsen ; Aleš Ude</i>	
LEARNING SPATIAL PRECONDITIONS OF MANIPULATION SKILLS USING RANDOM FORESTS	676
<i>Oliver Kroemer ; Gaurav S. Sukhatme</i>	
EFFICIENT REINFORCEMENT LEARNING FOR HUMANOID WHOLE-BODY CONTROL	684
<i>Ryan Lober ; Vincent Padois ; Olivier Sigaud</i>	
WALKING OF THE ICUB HUMANOID ROBOT IN DIFFERENT SCENARIOS: IMPLEMENTATION AND PERFORMANCE ANALYSIS	690
<i>Yue Hu ; Jorhabib Eljaik ; Kevin Stein ; Francesco Nori ; Katja Mombaur</i>	
A COMPACT TASK REPRESENTATION FOR HIERARCHICAL ROBOT CONTROL	697
<i>Luke Fraser ; Banafsheh Rekabdar ; Monica Nicolescu ; Mircea Nicolescu ; David Feil-Seifer ; George Bebis</i>	

TRAJECTORY OPTIMIZATION OF COMPLIANT HUMANOID (COMAN) ROBOT ARM USING PATH PARAMETER BASED DYNAMIC PROGRAMMING	705
<i>Zeeshan Shareef ; Jochen Steil</i>	
ENVIRONMENT-ADAPTIVE INTERACTION PRIMITIVES FOR HUMAN-ROBOT MOTOR SKILL LEARNING.....	711
<i>Yunduan Cui ; James Poon ; Takamitsu Matsubara ; Jaime Vails Miro ; Kenji Sugimoto ; Kimitoshi Yamazaki</i>	
MODEL-BASED PREDICTIVE BIPEDAL WALKING STABILIZATION	718
<i>Robert Wittmann ; Arne-Christoph Hildebrandt ; Daniel Wahrmann ; Felix Sygulla ; Daniel Rixen ; Thomas Buschmann</i>	
HUMANOID LOCALIZATION AND NAVIGATION USING A VISUAL MEMORY	725
<i>Josafat Delfin ; Hector M. Becerra ; Gustavo Arechavaleta</i>	
VERGENCE CONTROL WITH A NEUROMORPHIC ICUB	732
<i>Valentina Vasco ; Arren Glover ; Yeshasvi Tirupachuri ; Fabio Solari ; Manuela Chessa ; Chiara Bartolozzi</i>	
STATIONARY TORQUE REPLACEMENT FOR EVALUATION OF ACTIVE ASSISTIVE DEVICES USING HUMANOID	739
<i>Takahiro Ito ; Ko Ayusawa ; Eiichi Yoshida ; Hiroshi Kobayashi</i>	
ROBOT GAINS SOCIAL INTELLIGENCE THROUGH MULTIMODAL DEEP REINFORCEMENT LEARNING.....	745
<i>Ahmed Hussain Qureshi ; Yutaka Nakamura ; Yuichiro Yoshikawa ; Hiroshi Ishiguro</i>	
TACTILE-BASED MANIPULATION OF DEFORMABLE OBJECTS WITH DYNAMIC CENTER OF MASS.....	752
<i>Mohsen Kaboli ; Kunpeng Yao ; Gordon Cheng</i>	
THE DLR C-RUNNER: CONCEPT, DESIGN AND EXPERIMENTS.....	758
<i>Florian Loeffl ; Alexander Werner ; Dominic Lakatos ; Jens Reinecke ; Sebastian Wolf ; Robert Burger ; Thomas Gumpert ; Florian Schmidt ; Christian Ott ; Markus Grebenstein ; Alin Albu-Schäffer</i>	
INVERSE KINEMATICS OF A 3 DOF PARALLEL MANIPULATOR: A CONFORMAL GEOMETRIC ALGEBRA APPROACH.....	766
<i>O. Carbajal-Espinosa ; F. Izar-Bonilla ; M. Díaz-Rodríguez ; E. Bayro-Corrochano</i>	
A STUDY ON FINGERTIP DESIGNS AND THEIR INFLUENCES ON PERFORMING STABLE PREHENSION FOR ROBOT HANDS	772
<i>Keung Or ; Shu Morikuni ; Shun Ogasa ; Satoshi Funabashi ; Alexander Schmitz ; Shigeki Sugano</i>	
AN ACTIVE COMPLIANT IMPACT PROTECTION SYSTEM FOR HUMANOIDS: APPLICATION TO WALK-MAN HANDS	778
<i>Jinoh Lee ; Wooseok Choi ; Dimitrios Kanoulas ; Rajesh Subburaman ; Darwin G. Caldwell ; Nikolaos G. Tsagarakis</i>	
ENHANCEMENT OF MECHANICAL STRENGTH, COMPUTATIONAL POWER, AND HEAT MANAGEMENT FOR FIELDWORK HUMANOID ROBOTS.....	786
<i>Hiroshi Kaminaga ; Tianyi Ko ; Satoshi Yorita ; Shunsuke Sato ; Ryo Masumura ; Mitsuo Komagata ; Tatsuya Ishikawa ; Taira Miyatake ; Yoshihiko Nakamura</i>	
USING PREVIOUS EXPERIENCE FOR HUMANOID NAVIGATION PLANNING	794
<i>Yu-Chi Lin ; Dmitry Berenson</i>	
EXTRACTING GENERAL TASK STRUCTURES TO ACCELERATE THE LEARNING OF NEW TASKS	802
<i>Ilya Dianov ; Karinne Ramirez-Amaro ; Pablo Lanillos ; Emmanuel Dean-Leon ; Florian Bergner ; Gordon Cheng</i>	
GENERALIZATION OF ORIENTATIONAL MOTION IN UNIT QUATERNION SPACE.....	808
<i>Aljaž Kramberger ; Andrej Gams ; Bojan Nemec ; Aleš Ude</i>	
A JOINT-SPACE CONTROLLER BASED ON REDUNDANT MUSCLE TENSION FOR MULTIPLE DOF JOINTS IN MUSCULOSKELETAL HUMANOIDS	814
<i>Masaya Kawamura ; Soichi Ookubo ; Yuki Asano ; Toyotaka Kozuki ; Kei Okada ; Masayuki Inaba</i>	
THE SENSE OF SURFACE ORIENTATION — A NEW SENSOR MODALITY FOR HUMANOID ROBOTS.....	820
<i>Lukas Kaul ; Simon Ottenhaus ; Pascal Weiner ; Tamim Asfour</i>	
FULL BODY HUMAN MOTION ESTIMATION ON LIE GROUPS USING 3D MARKER POSITION MEASUREMENTS	826
<i>Josip Česić ; Vladimir Joukov ; Ivan Petrović ; Dana Kulić</i>	
OMNIDIRECTIONAL BIPEDAL WALKING WITH DIRECT FUSED ANGLE FEEDBACK MECHANISMS	834
<i>Philipp Allgeuer ; Sven Behnke</i>	
A CONVEX MODEL OF HUMANOID MOMENTUM DYNAMICS FOR MULTI-CONTACT MOTION GENERATION.....	842
<i>Brahayam Ponton ; Alexander Herzog ; Stefan Schaal ; Ludovic Righetti</i>	
LOCAL IMPLICIT SURFACE ESTIMATION FOR HAPTIC EXPLORATION.....	850
<i>Simon Ottenhaus ; Martin Miller ; David Schiebener ; Nikolaus Vahrenkamp ; Tamim Asfour</i>	
LEARNING HUMAN-ROBOT HANDOVERS THROUGH P-STAM: POLICY IMPROVEMENT WITH SPATIO-TEMPORAL AFFORDANCE MAPS.....	857
<i>Francesco Riccio ; Roberto Capobianco ; Daniele Nardi</i>	
ONLINE MASTER-SLAVE FOOTSTEP CONTROL FOR DYNAMICAL HUMAN-ROBOT SYNCHRONIZATION WITH WEARABLE SOLE SENSOR.....	864
<i>Yasuhiro Ishiguro ; Tatsuya Ishikawa ; Kunio Kojima ; Fumihito Sugai ; Shunichi Nozawa ; Yohei Kakiuchi ; Kei Okada ; Masayuki Inaba</i>	
EXPLOITING ANKLE TORQUE FOR ORBITAL STABILIZATION IN BIPED ROBOTS; A HYBRID ZERO DYNAMICS APPROACH	870
<i>Hamid Sadeghian ; Christian Ott ; Gordon Cheng</i>	

HUMAN MIMETIC MUSCULOSKELETAL HUMANOID KENGORO TOWARD REAL WORLD	
PHYSICALLY INTERACTIVE ACTIONS.....	876
<i>Yuki Asano ; Toyota Kozuki ; Soichi Ookubo ; Masaya Kawamura ; Shinsuke Nakashima ; Takeshi Katayama ; Iori Yanokura ; Toshinori Hirose ; Kento Kawaharazuka ; Shogo Makino ; Youhei Kakiuchi ; Kei Okada ; Masayuki Inaba</i>	
A FAST HEURISTIC CARTESIAN SPACE MOTION PLANNING ALGORITHM FOR MANY-DOF	
ROBOTIC MANIPULATORS IN DYNAMIC ENVIRONMENTS.....	884
<i>Phuong D. H. Nguyen ; Matej Hoffmann ; Ugo Pattacini ; Giorgio Metta</i>	
FROM MULTI-MODAL TACTILE SIGNALS TO A COMPLIANT CONTROL.....	892
<i>Emmanuel Dean-Leon ; Florian Bergner ; Karinne Ramirez-Amaro ; Gordon Cheng</i>	
ON-LINE JOINT LIMIT AVOIDANCE FOR TORQUE CONTROLLED ROBOTS BY JOINT SPACE	
PARAMETRIZATION.....	899
<i>Marie Charbonneau ; Francesco Nori ; Daniele Pucci</i>	
IF LOOKS COULD KILL: HUMANOID ROBOTS PLAY A GAZE-BASED SOCIAL GAME WITH HUMANS.....	905
<i>Oskar Palinko ; Alessandra Sciutti ; Yujin Wakita ; Yoshio Matsumoto ; Giulio Sandini</i>	
ROBUST OPTIMIZATION OF SYSTEM COMPLIANCE FOR PHYSICAL INTERACTION IN UNCERTAIN	
SCENARIOS.....	911
<i>G. M. Gasparri ; F. Fabiani ; M. Garabini ; L. Pallottino ; M. Catalano ; G. Grioli ; R. Persichin ; A. Bicchi</i>	
PART-BASED GRASP PLANNING FOR FAMILIAR OBJECTS.....	919
<i>Nikolaus Vahrenkamp ; Leonard Westkamp ; Natsuki Yamanobe ; Eren E. Aksoy ; Tamim Asfour</i>	
TACTILE-BASED COMPLIANCE WITH HIERARCHICAL FORCE PROPAGATION FOR	
OMNIDIRECTIONAL MOBILE MANIPULATORS.....	926
<i>Quentin Leboutet ; Emmanuel Dean-León ; Gordon Cheng</i>	
A NEWTON METHOD WITH ALWAYS FEASIBLE ITERATES FOR NONLINEAR MODEL PREDICTIVE	
CONTROL OF WALKING IN A MULTI-CONTACT SITUATION.....	932
<i>Diana Serra ; Camille Brasseur ; Alexander Sherikov ; Dimitar Dimitrov ; Pierre-Brice Wieber</i>	
OPEN SOURCE INTEGRATED 3D FOOTSTEP PLANNING FRAMEWORK FOR HUMANOID ROBOTS.....	938
<i>Alexander Stumpf ; Stefan Kohlbrecher ; David C. Conner ; Oskar von Stryk</i>	
LATENT KULLBACK-LEIBLER CONTROL FOR DYNAMIC IMITATION LEARNING OF WHOLE-BODY	
BEHAVIORS IN HUMANOID ROBOTS.....	946
<i>Yuka Aiki ; Takamitsu Matsubara ; Sang-Ho Hyon</i>	
VBLA, A SWING LEG CONTROL APPROACH FOR HUMANS AND ROBOTS.....	952
<i>Maziar A. Sharbafi ; Andre Seyfarth</i>	
LET'S HANDSHAKE AND I'LL KNOW WHO YOU ARE: GENDER AND PERSONALITY	
DISCRIMINATION IN HUMAN-HUMAN AND HUMAN-ROBOT HANDSHAKING INTERACTION.....	958
<i>Pierre-Henri Orefice ; Mehdi Ammi ; Moustapha Hafez ; Adriana Tapus</i>	
TWO WAYS OF WALKING: CONTRASTING A REFLEXIVE NEURO-CONTROLLER AND A LIP-BASED	
ZMP-CONTROLLER ON THE HUMANOID ROBOT ARMAR-4.....	966
<i>Cornelius Goldbeck ; Lukas Kaul ; Nikolaus Vahrenkamp ; Florentin Worgotter ; Tamim Asfour ; Jan-Matthias Braun</i>	
INCREASING THE EFFICIENCY OF 6-DOF VISUAL LOCALIZATION USING MULTI-MODAL SENSORY	
DATA.....	973
<i>Ronald Clark ; Sen Wang ; Hongkai Wen ; Niki Trigoni ; Andrew Markham</i>	
MECHANICS-BASED DESIGN OF UNDERACTUATED ROBOTIC WALKING GAITS: INITIAL	
EXPERIMENTAL REALIZATION.....	981
<i>Matthew J. Powell ; Wen-Loong Ma ; Eric R. Ambrose ; Aaron D. Ames</i>	
PLANNING REALISTIC INTERACTIONS FOR BIMANUAL GRASPING AND MANIPULATION.....	987
<i>Ashok M. Sundaram ; Oliver Porges ; Máximo A. Roa</i>	
UNIFIED TREATMENT OF SPARSE AND DENSE DATA IN GRAPH-BASED LEAST SQUARES.....	995
<i>René Wagner ; Udo Frese ; Berthold Bauml</i>	
EYE IN HAND: TOWARDS GPU ACCELERATED ONLINE GRASP PLANNING BASED ON	
POINTCLOUDS FROM IN-HAND SENSOR.....	1003
<i>Andreas Hermann ; Felix Mauch ; Sebastian Klemm ; Arne Roennau ; Ruediger Dillmann</i>	
COMPLIANTLY UNDERACTUATED HANDS BASED ON MULTIPOINT NETWORKS.....	1010
<i>Dipayan Das ; Nathanael J. Rake ; Joshua A. Schultz</i>	
MOTION GENERATION FOR PULLING A FIRE HOSE BY A HUMANOID ROBOT.....	1016
<i>Ixchel G. Ramirez-Alpizar ; Maximilien Naveau ; Christophe Benazeth ; Olivier Stasse ; Jean-Paul Laumond ; Kensuke Harada ; Eiichi Yoshida</i>	
ACTION-GROUNDED SURFACE GEOMETRY AND VOLUMETRIC SHAPE FEATURE	
REPRESENTATIONS FOR OBJECT AFFORDANCE PREDICTION.....	1022
<i>Barry Ridge ; Aleš Ude</i>	
DIFFERENTIAL DYNAMIC PROGRAMMING FOR GRAPH-STRUCTURED DYNAMICAL SYSTEMS:	
GENERALIZATION OF POURING BEHAVIOR WITH DIFFERENT SKILLS.....	1029
<i>Akihiko Yamaguchi ; Christopher G. Atkeson</i>	
STABILITY POLYGONS RESHAPING AND MORPHING FOR SMOOTH MULTI-CONTACT	
TRANSITIONS AND FORCE CONTROL OF HUMANOID ROBOTS.....	1037
<i>Hervé Audren ; Abderrahmane Kheddar ; Pierre Gergondet</i>	
COMBINING FINGER VISION AND OPTICAL TACTILE SENSING: REDUCING AND HANDLING	
ERRORS WHILE CUTTING VEGETABLES.....	1045
<i>Akihiko Yamaguchi ; Christopher G. Atkeson</i>	
FREE GAIT — AN ARCHITECTURE FOR THE VERSATILE CONTROL OF LEGGED ROBOTS.....	1052
<i>Péter Fankhauser ; C. Dario Bellicoso ; Christian Gehring ; Renaud Dubé ; Abel Gawel ; Marco Hutter</i>	

MOTION PRIMITIVE BASED RANDOM PLANNING FOR LOCO-MANIPULATION TASKS.....	1059
<i>Alessandro Settimi ; Danilo Caporale ; Przemyslaw Kryczka ; Mirko Ferrati ; Lucia Pallottino</i>	
USER ORIENTED ASSESSMENT OF VIBRATION SUPPRESSION BY COMMAND SHAPING IN A SUPERNUMERARY WEARABLE ROBOTIC ARM.....	1067
<i>Roozbeh Khodambashi ; Gil Weinberg ; William Singhose ; Shima Rishmawi ; Varun Murali ; Euisun Kim</i>	
PHYSICALLY PLAUSIBLE SCENE ESTIMATION FOR MANIPULATION IN CLUTTER	1073
<i>Karthik Desingh ; Odest Chadwicke Jenkins ; Lionel Reveret ; Zhiqiang Sui</i>	
MULTI-CONTACT MOTION RETARGETING FROM HUMAN TO HUMANOID ROBOT	1081
<i>Alessandro Di Fava ; Karim Bouyarmane ; Kevin Chappellet ; Emanuele Ruffaldi ; Abderrahmane Kheddar</i>	
MEDICAL ROBOT VISION USING THE CONFORMAL GEOMETRIC ALGEBRA FRAMEWORK	1087
<i>M. Garza-Burgos ; E. Sanchez-O ; E. Bayro-Corrochano</i>	
ACHIEVEMENT OF DYNAMIC TENNIS SWING MOTION BY OFFLINE MOTION PLANNING AND ONLINE TRAJECTORY MODIFICATION BASED ON OPTIMIZATION WITH A HUMANOID ROBOT	1094
<i>Ryo Terasawa ; Shintaro Noda ; Kunio Kojima ; Ryo Koyama ; Fumihito Sugai ; Shunichi Nozawa ; Yohei Kakiuchi ; Kei Okada ; Masayuki Inaba</i>	
SEQUENTIAL DECISION MAKING BASED ON EMERGENT EMOTION FOR A HUMANOID ROBOT	1101
<i>Murat Kirtay ; Lorenzo Vannucci ; Egidio Falotico ; Erhan Oztop ; Cecilia Laschi</i>	
HUMAN MOTION SEGMENTATION USING COST WEIGHTS RECOVERED FROM INVERSE OPTIMAL CONTROL	1107
<i>Jonathan Feng-Shun Lin ; Vincent Bonnet ; Adina M. Panchea ; Nacim Ramdani ; Gentiane Venture ; Dana Kulić</i>	
TASK-ORIENTED PLANNING ALGORITHM FOR HUMANOID ROBOTS BASED ON A FOOT REPOSITIONABLE INVERSE KINEMATICS ENGINE.....	1114
<i>Xianchao Long ; Murphy Wonsick ; Velin Dimitrov ; Taşkın Pađur</i>	
DYNAMIC BEHAVIORS ON THE NAO ROBOT WITH CLOSED-LOOP WHOLE BODY OPERATIONAL SPACE CONTROL.....	1121
<i>Donghyun Kim ; Steven Jens Jorgensen ; Peter Stone ; Luis Sentis</i>	
LEARNING AND FORCE ADAPTATION FOR INTERACTIVE ACTIONS	1129
<i>You Zhou ; Martin Do ; Tamim Asfour</i>	
EQUILIBRIUM-POINT-BASED SYNERGIES THAT ENCODE COORDINATES IN TASK SPACE: A PRACTICAL METHOD FOR TRANSLATING FUNCTIONAL SYNERGIES FROM HUMAN TO MUSCULOSKELETAL ROBOT ARM.....	1135
<i>Fumiaki Yoshikawa ; Hiroaki Hirai ; Eichi Watanabe ; Yuma Nagakawa ; Akira Kuroiwa ; Emerson Grabke ; Mitsunori Uemura ; Fumio Miyazaki ; Hermanno Igo Krebs</i>	
LEARNING TO REACH BY BUILDING A REPRESENTATION OF PERI-PERSONAL SPACE.....	1141
<i>Jonathan Juett ; Benjamin Kuipers</i>	
3D OBJECT SEGMENTATION FOR SHELF BIN PICKING BY HUMANOID WITH DEEP LEARNING AND OCCUPANCY VOXEL GRID MAP	1149
<i>Kentaro Wada ; Masaki Murooka ; Kei Okada ; Masayuki Inaba</i>	
BALANCED AND FALLING STATES FOR BIPED SYSTEMS: APPLICATIONS TO ROBOTIC VERSUS HUMAN WALKING STABILITY	1155
<i>Carlotta Mummolo ; Francesco Cursi ; Joo H. Kim</i>	
CONVEXITY OF STIFFNESS MATRIX EIGENVALUES FOR A POSITION CONTROLLED LIMB OF MOBILE CLIMBING ROBOTS.....	1161
<i>Xuan Lin ; Dennis W. Hong</i>	
EXPLOITING INVARIANT STRUCTURE FOR CONTROLLING MULTIPLE MUSCLES IN ANTHROPOMORPHIC LEGS: II. EXPERIMENTAL EVIDENCE FOR THREE EQUILIBRIUM-POINT- BASED SYNERGIES DURING HUMAN PEDALING	1167
<i>Eichi Watanabe ; Takanori Oku ; Hiroaki Hirai ; Fumiaki Yoshikawa ; Yuma Nagakawa ; Akira Kuroiwa ; Emerson Paul Grabke ; Mitsunori Uemura ; Fumio Miyazaki ; Hermanno Igo Krebs</i>	
STEREO VISION OF LIQUID AND PARTICLE FLOW FOR ROBOT POURING	1173
<i>Akihiko Yamaguchi ; Christopher G. Atkeson</i>	
UNSUPERVISED OBJECT SEGMENTATION THROUGH CHANGE DETECTION IN A LONG TERM AUTONOMY SCENARIO.....	1181
<i>Rares Ambrus ; John Folkesson ; Patric Jensfelt</i>	
TOWARDS ASSISTIVE HUMAN-ROBOT MICRO MANIPULATION.....	1188
<i>Niklas Bergström ; Shouren Huang ; Yuji Yamakawa ; Taku Senoo ; Masatoshi Ishikawa</i>	
EVALUATION-CONTROLLING MECHANISM OF PERCEPTION, PLANNING, AND EXECUTION FOR A LIFE-SIZED HUMANOID ROBOT.....	1196
<i>Yohei Kakiuchi ; Ryohei Ueda ; Iori Kumagai ; Shunichi Nozawa ; Kei Okada ; Masayuki Inaba</i>	
TOWARD AN ADAPTIVE FOOT FOR NATURAL WALKING	1204
<i>Cristina Piazza ; Cosimo Della Santina ; Gian Maria Gasparri ; Manuel G. Catalano ; Giorgio Grioli ; Manolo Garabini ; Antonio Bicchi</i>	
ENVIRONMENT COMPENSATION USING A POSTERIORI STATISTICS FOR DISTANT SPEECH-BASED HUMAN-ROBOT INTERACTION	1211
<i>Randy Gomez ; Keisuke Nakamura</i>	
PARTICLE TRACES FOR DETECTING DIVERGENT ROBOT BEHAVIOR	1217
<i>Samuel Zapolsky ; Evan Drumwright</i>	
REAL-TIME STATE ESTIMATION WITH WHOLE-BODY MULTI-CONTACT DYNAMICS: A MODIFIED UKF APPROACH	1225
<i>Kendall Lowrey ; Jeremy Dao ; Emanuel Todorov</i>	

SELF-CALIBRATION OF JOINT OFFSETS FOR HUMANOID ROBOTS USING ACCELEROMETER MEASUREMENTS	1233
<i>Nuno Guedelha ; Naveen Kuppuswamy ; Silvio Traversaro ; Francesco Nori</i>	
DESIGN OF A SERIES ELASTIC RESISTANCE MECHANISM FOR EXERCISE AND REHABILITATION	1239
<i>Kevin G. Gim ; Dennis W. Hong</i>	
INTRODUCING ‘THEOMORPHIC ROBOTS’	1245
<i>Gabriele Trovato ; Francisco Cuellar ; Masao Nishimura</i>	
LEARNING TASK TRANSITION FROM STANDING-UP TO WALKING FOR A SQUATTED BIPEDAL HUMANOID ROBOT	1251
<i>Dingsheng Luo ; Yian Deng ; Xiaoqiang Han ; Fan Hu ; Xihong Wu</i>	
RECONFIGURABLE TASKS IN BELIEF-SPACE PLANNING	1257
<i>Dirk Ruiken ; Tiffany Q. Liu ; Takeshi Takahashi ; Roderic A. Grupen</i>	
EXPERIENCE-BASED LEARNING OF SYMBOLIC NUMERICAL CONSTRAINTS	1264
<i>Gokhan Solak ; Abdullah Cihan Ak ; Sanem Sariel</i>	
CRAWLING GAIT FOR FOUR-LIMBED ROBOT AND SIMULATION ON UNEVEN TERRAIN	1270
<i>Takashi Matsuzawa ; Ayanori Koizumi ; Kenji Hashimoto ; Xiao Sun ; Shinya Hamamoto ; Tomotaka Teramachi ; Shunsuke Kimura ; Nobuaki Sakai ; Atsuo Takanishi</i>	
STABILIZATION METHOD FOR DYNAMIC GAIT IN BIPEDAL WALKING ROBOTS	1276
<i>L. Campos-Macias ; O. Carbajal-Espinosa ; A. Loukianov ; E. Bayro-Corrochano</i>	
DYNAMIC BIPEDAL WALKING BY CONTROLLING ONLY THE EQUILIBRIUM OF INTRINSIC ELASTICITIES	1282
<i>Dominic Lakatos ; Alin Albu-Schäffer ; Christian Rode ; Florian Loeffl</i>	
PASSIVITY OF TIME-DELAYED WHOLE-BODY OPERATIONAL SPACE CONTROL WITH SERIES ELASTIC ACTUATION	1290
<i>Ye Zhao ; Luis Sentis</i>	
WORKSPACE ANALYSIS FOR PLANNING HUMAN-ROBOT INTERACTION TASKS	1298
<i>Nikolaus Vahrenkamp ; Harry Arnst ; Mirko Wächter ; David Schiebener ; Panagiotis Sotiropoulos ; Michal Kowalik ; Tamim Asfour</i>	
KINEMATICS-BASED ESTIMATION OF CONTACT CONSTRAINTS USING ONLY PROPRIOCEPTION	1304
<i>Valerio Ortenzi ; Hsiu-Chin Lin ; Morteza Azad ; Rustam Stolkin ; Jeffrey A. Kuo ; Michael Mistry</i>	
WALKING ON PARTIAL FOOTHOLDS INCLUDING LINE CONTACTS WITH THE HUMANOID ROBOT ATLAS	1312
<i>Georg Wiedebach ; Sylvain Bertrand ; Tingfan Wu ; Luca Fiorio ; Stephen McCrory ; Robert Griffin ; Francesco Nori ; Jerry Pratt</i>	
Author Index	