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| WC6-3 | <a href="#">Development of Simulator for Autonomous Underwater Vehicles utilizing Underwater Acoustic and Optical Sensing Emulators</a><br><i>Jason Kim, Minsung Sung, Son-Cheol Yu(Pohang University of Science and Technology, Korea)</i> | 416 |
| WC6-4 | <a href="#">A Sea Creatures Classification Method using Convolutional Neural Networks</a><br><i>Jonghyun Ahn, Yuya Nishida, Kazuo Ishii, Tamaki Ura(Kyushu Institute of Technology, Japan)</i>  | 420 |
| WC6-5 | <a href="#">Underwater Agent Vehicle for Manipulation and Object Recovery Using Winch System</a><br><i>Juhwan Kim, Meungsuk Lee, Hyeonwoo Cho, Son-Cheol Yu(Pohang University of Science and Technology (POSTECH), Korea)</i>               | 424 |

WC6-6	<a href="#">Design and Implementation of Backstepping Controller for Tilting Thruster Underwater Robot</a> <i>Santhakumar Mohan</i> (Indian Institute of Technology, India), <i>Jagadeesh Kadiyam</i> (IIT Indore, India), <i>Devendra Deshmukh</i> (Indian Institute of Technology, India), <i>TaeWon Seo</i> (Hanyang University, Korea)	427
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### WC7 Autonomous Vehicle Systems III

October 17 (Wednesday) 17:00~18:30, Birch

Chair: Kranthi Kumar Deveerasetty (Shenzhen Institutes of Advanced Technology, Chinese Academy of Sciences, China)

WC7-1	<a href="#">Extended State Observer-based Robust Pitch Autopilot Design for Small UAV</a> <i>Seungyun Jung, Youdan Kim</i> (Seoul National University, Korea)	433
WC7-2	<a href="#">PID with derivative filter and integral sliding-mode controller techniques applied to an indoor micro quadrotor</a> <i>Kranthi Kumar Deveerasetty, Yimin Zhou</i> (Shenzhen Institutes of Advanced Technology, Chinese Academy of Sciences, China)	439
WC7-3	<a href="#">Vision Based Tracking for Moving Target in Cluttered Environment with Path Generation for Visibility under Arbitrary Occlusion</a> <i>Boseong Jeon</i> (Seoul National University, Korea), <i>H. Jin Kim</i> (Seoul National University, Korea)	N/A
WC7-4	<a href="#">Implementation of the hybrid technology for quadcopter motion control in a complex non-deterministic environment</a> <i>Igor Olegovich Shapovalov, Dmitriy Vladimirovich Devitt, Roman Olegovich Morozov, Mikhail Yurjevich Medvedev, Georgiy Igorevich Konovalov</i> (Southern Federal University, Russian Federation)	451
WC7-5	<a href="#">Communication Relay Applications of a Solar-powered UAV Following a Collision-free Optimal Flight Path</a> <i>Giancarlo Eder Guerra Padilla, Seong-Hwan Kim, Kee-Ho Yu</i> (Chonbuk National University, Korea)	457

## TA1 Machine Vision and Recognition I

October 18 (Thursday) 09:10~10:40, Sapphire

Chair: Hyejeong Ryu (Kangwon National University, Korea)

TA1-1	<a href="#">Real-Time Vision-Based Localization of Planar Cable-Driven Parallel Robot</a> <i>Muhammad Awais</i> (Chonnam National University,, Korea), <i>Chang-Sei Kim</i> (Chonnam National University, Korea)	462
TA1-2	<a href="#">Estimation of traveling direction of car body using optical flow derived from onboard camera</a> <i>Hiromichi Koba</i> (Kumamoto university, Japan), <i>Teruo Yamaguchi</i> , <i>Hiroshi Harada</i> (Kumamoto University, Japan)	466
TA1-3	<a href="#">Loosely-Coupled INS/Vision based Absolute Navigation with Adaptive Kalman Filter</a> <i>Sung Hyuk Choi</i> , <i>Chan Gook Park</i> (Seoul National University, Korea)	471
TA1-4	<a href="#">Semantic Scene Recognition and Zone Labeling for Mobile Robot Benchmark Datasets based on Category Maps</a> <i>Ryoma Fukushi</i> , <i>Hirokazu Madokoro</i> , <i>Kazuhito Sato</i> (Akita Prefectural University, Japan)	475
TA1-5	<a href="#">Generalized Extreme Value Trimmed Filter for Random Impulse Noise Suppression in Color image</a> <i>Sakon Chankhachon</i> , <i>Sathit Intajag</i> (Prince of Songkla University, Thailand)	481

## TA2 SICE-ICROS joint session - Robot Technology and Application

October 18 (Thursday) 09:10~10:40, Crystal

Chair: Takashi Yoshimi (Shibaura Institute of Technology, Japan)

TA2-1	<a href="#">TSMCSPO Based Position Control for a Hydraulic Manipulator</a> <i>Jie Wang</i> , <i>Hyun Hee Kim</i> , <i>Karam Dad Kallu</i> , <i>Min Cheol Lee</i> (Pusan National University, Korea)	N/A
TA2-2	<a href="#">Path Planning by Multilayer Neural Network and Rapidly Exploring Random Tree</a> <i>Takahiro Yamashita</i> (Kyushu Institute of Technology, Japan)	N/A
TA2-3	<a href="#">Development of a Tiny Impact Device for Hammering Inspection</a> <i>Masamitsu Kurisu</i> (Tokyo Denki University, Japan), <i>Hiroaki Kuwahara</i> (Corporate Manufacturing Engineering Center TOSHIBA Corporation, Japan)	494
TA2-4	<a href="#">Stable Grasping of Objects Using Air Pressure Sensors on a Robot Hand</a> <i>Dong Eon Kim</i> , <i>Ki Seo Kim</i> , <i>Jin Hyun Park</i> , <i>Aiing Lee</i> , <i>Jang Myung Lee</i> (Pusan National University, Korea)	500
TA2-5	<a href="#">Foreground Segmentation using Convolutional Neural Network</a> <i>Ajmal Shahbaz</i> , <i>Kang-Hyun Jo</i> (University of Ulsan, Korea)	N/A
TA2-6	<a href="#">Automatic Rubber Attachment by a Robot Arm for Cardboard Punching Mold Fabrication</a> <i>Takashi Yoshimi</i> (Shibaura Institute of Technology, Japan), <i>Yuta Ito</i> (Shibaura Institute of, Japan)	505

### TA3 Biomedical systems and Applications

October 18 (Thursday) 09:10~10:40, Ruby

Chair: Pikulkaew Tangtisanon (King Mongkut's Institute of Technology, Thailand)

- |       |  |     |
|-------|--|-----|
| TA3-1 | <a href="#">Unorthodox Approach to Classify EEG Signals for Upper Limb Prosthesis Application</a><br><i>Nasir Rashid, Fahad Mahmood, Javaid Iqbal(National University of Sciences and Technology, Pakistan)</i>                | 508 |
| TA3-2 | <a href="#">Real time Human Emotion Monitoring based on Bio-signals</a><br><i>Pikulkaew Tangtisanon(King Mongkut's Institute of Technology Ladkrabang, Faculty of Engineering, Thailand)</i>                                   | 513 |
| TA3-3 | <a href="#">Remote human motion detecting system based on infrared array sensor</a><br><i>Yiwei Zhu, Tong Li, Shigeyuki Tateno(Waseda University, Japan)</i>   | N/A |
| TA3-4 | <a href="#">Development of Drowsiness Detection System based on Respiration Rate and LF-HF Ratio</a><br><i>Ziyuan WANG, XIA GUAN, Zhaoxian Qu, Shigeyuki Tateno(Waseda University, Japan)</i>                                  | N/A |
| TA3-5 | <a href="#">Partical simulation on biomolecular reaction system in contaminating reaction field</a><br><i>Keisuke Watanabe(Kyushu institute of Technology, Japan), Takashi Nakakuki(Kyushu Institute of Technology, Japan)</i> | N/A |

### TA4 Control and identification II

October 18 (Thursday) 09:10~10:40, Opal

Chair: Hyung-Soon Park (KAIST, Korea)

- |       |   |     |
|-------|---|-----|
| TA4-1 | <a href="#">Identification of Continuous-Time Low-Order models via Weighted Moments</a><br><i>SeungPyo Cha(Chungbuk National University, Korea), JongGeon Lee(Agency for Defense Development, Korea), Young Chol Kim(Chungbuk National University, Korea)</i> | 535 |
| TA4-2 | <a href="#">Prediction Impulsive Observer for Sampled Data Linear Systems</a><br><i>Atif Qayyum(National University of Sciences and Technology, Pakistan)</i>   | 541 |
| TA4-3 | <a href="#">Model based Real-Time Flow Rate Estimation in Open Channels with Application to Conventional Drilling</a><br><i>Asanthi Jinasena, Roshan Sharma(University of South-Eastern Norway, Norway)</i>   | 546 |
| TA4-4 | <a href="#">A filtered-x optimal step-size-NSAF active noise cancellation algorithm robust to impulse noise with step-size scaler</a><br><i>Taesu Park, Dongwoo Kim, PooGyeon Park(Pohang University of Science and Technology, Korea)</i>                    | N/A |

### TA5 Sensors and Actuators I

October 18 (Thursday) 09:10~10:40, Red Pine

Chair: Takeshi Mizuno (Saitama University, Japan)

- |       |  |     |
|-------|--|-----|
| TA5-1 | <a href="#">Realization of Magnetic Suspension by Flux-Path Control Mechanisms Lying Lateral to Magnetic Source</a><br><i>Takeshi Mizuno, Naoki Ishibashi, Yuji Ishino, Daisuke Yamaguchi, Masaya Takashi(Saitama University, Japan)</i> | N/A |
|-------|--|-----|

TA5-2	<a href="#">Position Control of Brushless DC Motor using Adaptive Sliding mode Control</a> <i>Jinsuk Choi(POSTECH, Korea)</i>	N/A
TA5-3	<a href="#">MOBILE APPLICATION FOR RECOVERING PARALYSIS PATIENT'S MOTION</a> <i>Anuntapat Anuntachai(King Mongkut's Institute of technology Ladkrabang, Thailand)</i>	564
TA5-4	<a href="#">Use of Deep Learning for Position Estimation and Control of Soft Glove</a> <i>Jeesoo Ha(Korea Advanced Institute of Science and Technology, Korea), Dooyoung Kim, Sungho Jo(KAIST, Korea)</i>	570
TA5-5	<a href="#">Development of Compatible Induction coil with Pure AC for Hall Effect Sensor: A Study on Metal Materials Thickness</a> <i>Witsarut Sriratana, Yannadech - Khwankityotha, Sutham Satthamsakul(King Mongkut's Institute of Technology Ladkrabang, Thailand)</i>	575
TA5-6	<a href="#">Development of Sensor Module for Detecting the Magnetron Power Based on Microwave Oven Frequency</a> <i>Sutham Satthamsakul, Witsarut Sriratana(King Mongkut's Institute of Technology Ladkrabang, Thailand)</i>	580

#### TA6 Information and Network Theories

October 18 (Thursday) 09:10~10:40, Azalea

Chair: Han-Lim Choi (KAIST, Korea)

TA6-1	<a href="#">Comparison of RSSI collecting methods in RSSI-Based Indoor Positioning System with ZigBee</a> <i>Hiroki Abe, Yu Wu, Tong Li, Shigeyuki Tateno(Waseda University, Japan)</i>	N/A
TA6-2	<a href="#">Comparison of Wireless Communication Technologies in Remote Monitoring System</a> <i>Tong Li, Hiroki Abe, Shigeyuki Tateno(Waseda University, Japan)</i>	591
TA6-3	<a href="#">Anomaly detection using Source Port Data with Shannon Entropy and EWMA Control Chart</a> <i>Siriphanga Ransewa(Prince of Songkla University, Thailand)</i>	596
TA6-4	<a href="#">AUTOSAR Runnable Scheduling for Optimal Tradeoff between Control Performance and CPU Utilization</a> <i>Jong-Chan Kim, Tae-Wook Kim(Kookmin University, Korea), Gun-Min Lee(LG Innotek, Korea)</i>	602

#### TA7 Autonomous Vehicle Systems IV

October 18 (Thursday) 09:10~10:40, Birch

Chair: Hyoung Il Son (Chonnam National University, Korea)

TA7-1	<a href="#">Set membership estimation applied to the localization of small UAS in tight flight formations</a> <i>Soheib Fergani(LAAS-CNRS, France), Jan Bolting(ISAIE-SUPAERO, France)</i>	606
TA7-2	<a href="#">Tracking Control of a Multirotor UAV in a Network Environment with Time-Varying Delay</a> <i>Dohyun Jang(Seoul National University, Korea), Jaehyun Yoo(Hankyong National University, Korea), H. Jin Kim(Seoul National Univ, Korea)</i>	612



TA7-3	<a href="#">A Coordinated Control Method of Thrust Vector and Aerodynamic Surfaces Based on Control Allocation Technology</a> <i>Shi Jingping, Lv Yongxi, Qu Xiaobo, Shi Jing(Northwestern Polytechnical University, China)</i>	618
TA7-4	<a href="#">An Improved Method of Control Law Design at High Angle of Attack Based on Wind Tunnel Test Data</a> <i>Yongxi Lyu, Yuyan Cao, Weiguo Zhang, Jingping Shi, Xiaobo Qu(Northwestern Polytechnical University, China)</i>	625
TA7-5	<a href="#">Reconfigurable Flight Control System design for Blended Wing Body UAV based on Control Allocation</a> <i>Xiaobo Qu, Jingping Shi(Northwestern Polytechnical University, China), Haijun Zhou, Ling Zuo(Filght Automatic Control Research Institute, China), Yongxi Lyu(Northwestern Polytechnical University, China)</i>	632
TA7-6	<a href="#">PLC-based Mobile Mecanum Robot As Multipurpose Vehicle</a> <i>Napasool Wongvanich, Suphan Gulpanich, Taweepol Suesat, Viriya Kongratana(King Mongkut's Institute of Technology Ladkrabang, Thailand)</i>	639

## **TB1 Machine Vision and Recognition II**

October 18 (Thursday) 15:20~16:50, Sapphire

Chair: Kaset Sirisantisamrid (King Mongkut's Institute of Technology Ladkrabang, Thailand)

TB1-1	<a href="#">ROI-based Fully Automated Liver Registration in Multi-phase CT Images</a> <i>Kentaro Saito, Hyoungeop Kim(Kyushu institute of technology, Japan)</i>	645
TB1-2	<a href="#">Comparative Study of Character Recognition on Thai License Plate using DCT and FIR System</a> <i>Kaset Sirisantisamrid, Napasool Wongvanich, Suphan Gulpanich(King Mongkut's Institute of Technology Ladkrabang, Thailand)</i>	650
TB1-3	<a href="#">Recognition of Single-Land Countries on Outline Images by Using BAS Feature</a> <i>Eren Yildirim(Bahcesehir University, Korea), Ömer Faruk Ince(Kyungsung University, Korea), Yucel Batu Salman, Ege Sadic(Bahcesehir University, Turkey), Jang Sik Park(Kyungsung University, Korea)</i>	656
TB1-4	<a href="#">Ensemble Grid Formation to Detect Potential Anomalous Regions Using Context Encoders</a> <i>Muhammad Zaigham Zaheer, Marcella Astrid(University of Science and Technology, Korea), Seung-Ik Lee(Electronics and Telecommunication Research Institute (ETRI) / University of Science and Technology, Korea), Ho Chul Shin(Electronics and Telecommunication Research Institute (ETRI), Korea)</i>	661

## **TB2 SICE-ICROS Joint Organized Session - Control System Design**

October 18 (Thursday) 15:20~16:50, Crystal

Chair: Shiro Masuda (Tokyo Metropolitan University, Japan)

TB2-1	<a href="#">LQG Control Design For a Coupled Ballbot Dynamical System</a> <i>Do Van Thach, Soon-Geul Lee(Kyung Hee University, Korea)</i>	666
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TB2-2	<a href="#">I-PD Controller Gain Tuning using a Nonlinear Optimal Control Design Method for Helicopter Attitude Control Model</a> <i>Sota Takahashi, Shiro Masuda(Tokyo Metropolitan University, Japan)</i>	N/A
TB2-3	<a href="#">Consensus Control of Multi-agent Systems Over Undirected Graphs with Quantized Signal Communication</a> <i>Takumi Furusaka, Takao Sato, Nozomu Araki, Yasuo Konishi(University of Hyogo, Japan)</i>	673
TB2-4	<a href="#">Servo/Regulation Optimization Design for Dual-rate Control Systems - Comparison of three suppression methods -</a> <i>Takao Sato, Ryota Yasui, Natsuki Kawaguchi, Nozomu Araki, Yasuo Konishi(University of Hyogo, Japan)</i>	N/A
TB2-5	<a href="#">At-Sea Test of Dynamic Positioning System for a Quad-Maran Unmanned Vessel</a> <i>Makoto Komizo, Chenfang Zhang, Naoyuki Hara, Yasunori Nihei, Keiji Konishi(Osaka Prefecture University, Japan)</i>	N/A
TB2-6	<a href="#">Load Speed Control of Two-inertia System by Load Speed/Torque Estimation and Torsion Torque Compensation</a> <i>Daehan Kim, Juhoon Back(Kwangwoon University, Korea)</i>	685

### **TB3 Human-Centered Robotics on Field and Bio-Medical Rehabilitation**

October 18 (Thursday) 15:20~16:50, Ruby

Chair: Seul Jung (Chungnam National University, Korea)

TB3-1	<a href="#">On Realizing Robust Box-Pushing Tasks for Two Mobile Robots</a> <i>Min Jeong Kim, Jung-Min Yang(Kyungpook National University, Korea)</i>	N/A
TB3-2	<a href="#">Design of a Real-Time State Observer for Joint Acceleration of a Robot Manipulator(KOBOKER)</a> <i>Sang Deok Lee, Seul Jung(Chungnam National University, Korea)</i>	692
TB3-3	<a href="#">Design of triggering mechanism for capsule endoscope</a> <i>Seonggun Joe, Hyeongseok Kang, Dongkyu Lee(Korea Aerospace University, Korea), Byungjeon Kang, Jong-Oh Park(Chonnam University, Korea), Byungkyu Kim(Korea Aerospace University, Korea)</i>	695
TB3-4	<a href="#">Improved Anytime Path Planning and Replanning Algorithm for Real-time UAV Operation</a> <i>Aye Aye Maw, Maxim Tyan, Jae-Woo Lee(Konkuk University, Korea), Dong Sik Kim(Pohang University, Korea)</i>	N/A

### **TB4 Sensing, Learning, and Control in Robots and Systems I**

October 18 (Thursday) 15:20~16:50, Opal

Chair: Hsien-I-Lin (National Taipei University of Technology, Taiwan)

TB4-1	<a href="#">Application of Instantaneous Cantilever Frequency Fluctuation in Atomic Force Microscope Control Loop</a> <i>Peter I-Tsyuen Chang, Zi-Cheng Shu(National Taiwan University of Science and Technology, Taiwan)</i>	700
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TB4-2	<a href="#">Adaptive Tracking Control for Quadrotor System with Dynamic Uncertainty</a> <i>Yen-Chen Liu, <u>Tsung-Wei Ou</u>(National Cheng Kung University, Taiwan)</i>	N/A
TB4-3	<a href="#">Interactive Reinforcement Learning based Socially Assistive Robot for the Emotional Support of Children</a> <i>Edwinn Gamborino, Li-Chen Fu(National Taiwan University, Taiwan)</i>	708
TB4-4	<a href="#">A numerical study of nonlinear dynamics in electric power systems</a> <i>Der-Cherng Liaw, <u>Hung-Tse Lee</u>, Yun-Hua Huang(National Chiao Tung University, Taiwan)</i>	N/A

### TC3 Technology for helping hand assistance and rehabilitation

October 18 (Thursday) 17:00~18:30, Ruby

Chair: Kyujin Cho (Seoul National University, Korea)

TC3-1	<a href="#">Performance Verification of Highly Stretchable Soft Sensors</a> <i>Dahee Jeong(Ulsan National Institute of Science and Technology, Korea), Joonbum Bae(UNIST, Korea)</i>	N/A
TC3-2	<a href="#">Soft hand rehabilitation glove for patients with neurological disorders</a> <i>Dong Hyun Kim, Hyung-Soon Park(KAIST, Korea)</i>	N/A
TC3-3	<a href="#">Thumb CMC(Carpometacarpal) joint for the prosthetic hand with a realistic motion</a> <i>Si-Hwan Heo(Korea Advanced Institute of Science and Technology, Korea), Hyung-Soon Park(KAIST, Korea)</i>	N/A
TC3-4	<a href="#">Plane Thimble for Adaptive and Sensor Embeddable Design for Exo-Glove Poly</a> <i>Hyungmin Choi, Brian Byunghyun Kang, Kyujin Cho(Seoul National University, Korea)</i>	N/A
TC3-5	<a href="#">Teflon Tubes Selection based on Friction Tests for Exo-Glove Poly</a> <i>Brian Byunghyun Kang, Hyungmin Choi, Kyujin Cho(Seoul National University, Korea)</i>	N/A
TC3-6	<a href="#">Modeling of the relationship between wire tension and joint torque for force control of tendon driven hand assist wearable robots</a> <i>Byungchul Kim, Kyujin Cho(Seoul National University, Korea)</i>	N/A

### TC4 Sensing, Learning, and Control in Robots and Systems II

October 18 (Thursday) 17:00~18:30, Opal

Chair: Hsien-I-Lin (National Taipei University of Technology, Taiwan)

TC4-1	<a href="#">A Cost-effective Tracking Method for Leader-Follower Mobile Robots Control Using Photovoltaic Sensor</a> <i>Kuang-Yow Lian, Wei-Hsiu Hsu, Deepak Balram(National Taipei University of Technology, Taiwan)</i>	N/A
TC4-2	<a href="#">Visual Servoing and Compliant Motion Control of a Continuum Robot</a> <i>Kai-Tai Song, Han-Chih Tsai(National Chiao Tung University, Taiwan)</i>	734
TC4-3	<a href="#">Robotic Arm Path Planning Based on Three-Dimensional Artificial Potential Field</a> <i>Hsien-I Lin, Ming-Feng Hsieh(National Taipei University of Technology, Taiwan)</i>	740
TC4-4	<a href="#">Motion planning with obstacle avoidance of an UR3 robot using charge system search</a> <i>Chih-Jer Lin(National Taipei University of Technology, Taiwan)</i>	746

## TC5 Sensors and Actuators II

October 18 (Thursday) 17:00~18:30, Red Pine

Chair: Hyungtae Kim (KITECH, Korea)

- |       |  |     |
|-------|--|-----|
| TC5-1 | <a href="#">Linear-range Extension for Linear Variable Differential Transformer Using Triangular Signal</a>  | 751 |
|       | <i>Wittaya Koodtalang, <u>Wandee Petchmaneelumka</u>, Kanoknuch Songsuwankit, Vanchai Riewruja(King Mongkut's Institute of Technology Ladkrabang, Thailand)</i>  |     |
| TC5-2 | <a href="#">Maximum Contrast Imaging Using Chromatic Lighting and Fuzzy Logic: Analyses of Old Handwritings</a>  | 756 |
|       | <i>Hyungtae Kim(KITECH, Korea), NamKyeong Kim, Kyeongnan Nam(Deagu Catholic University, Korea), Kwon-Hee Nam(Kyungpook National University, Korea)</i>   |     |
| TC5-3 | <a href="#">An Integrated Approach of Wavelet Techniques and Time Series Analysis in Eliminating MEMS Inertial Gyro Stochastic Error</a>   | 762 |
|       | <i>Yingjie Hu, Lu Xiong(Tongji University, China)</i>  |     |
| TC5-4 | <a href="#">Low Cost MEMS-IMU Based DR/GPS Integrated System in Urban Environment</a>  | 767 |
|       | <i>Woo Jung Park, Jae Hong Lee, Chang Ho Kang(Seoul National University, Korea), Myung Hwan Seo, Sang Yeon Park, Jong Yun Yeo(Hyundai MNSOFT, Korea), Jin Woo Song(Sejong University, Korea), Chan Gook Park(Seoul National University, Korea)</i> |     |
| TC5-5 | <a href="#">Yaw Error Measurement Reduction of TMDP</a>  | 772 |
|       | <i>Vittaya Tipsuwanporn(King Mongkut's Institute of Technology Ladkrabang, Thailand), <u>Wanchai Chinchusak</u>(Department of Science Service, Thailand), Arjin Numsomran(King Mongkut's Institute of Technology Ladkrabang, Thailand)</i>         |     |

## TC6 Intelligent Defense Systems

October 18 (Thursday) 17:00~18:30, Azalea

Chair: Han-Lim Choi (KAIST, Korea)

- |       |   |     |
|-------|---|-----|
| TC6-1 | <a href="#">Ballistic Coefficient Estimation with Guassian Process Particle Filter</a>                                  | 776 |
|       | <i><u>Il-Chul Moon</u>, Jinhyung Tak, Sang-Hyeon Kim, Kyungwoo Song(KAIST, Korea)</i>                                   |     |
| TC6-2 | <a href="#">Black-Box Expectation-Maximization Algorithm for Estimating Latent States of High-Speed Vehicles</a>        | 781 |
|       | <i><u>Yoon-Yeong Kim</u>, Wonsung Lee, Il-Chul Moon(KAIST, Korea)</i>   |     |
| TC6-3 | <a href="#">Tracking of multiple targets using GM-PHD filter with nonlinear measurement model</a>                       | 787 |
|       | <i><u>Jun-Yong Lee</u>, Wonchul Kim, Hyounjin Kim(Seoul National University, Korea)</i>                                 |     |
| TC6-4 | <a href="#">Convexity-based sequential track resource allocation for a phased array radar</a>                           | 791 |
|       | <i><u>Soon-Seo Park</u>(KAIST, Korea), Dae-Sung Jang(Korea Aerospace University, Korea), Han-Lim Choi(KAIST, Korea)</i> |     |
| TC6-5 | <a href="#">Topology Optimization of Hierarchical Sensor Fusion Network Considering Time Delay</a>                      | 795 |
|       | <i><u>Woo-Cheol Lee</u>, Han-Lim Choi(University, Korea)</i>  |     |
| TC6-6 | <a href="#">Simulated Physics for High Speed Aerial Systems</a>   | 800 |
|       | <i><u>MinKu Kang</u>, Kee-Eung Kim(KAIST, Korea)</i>  |     |

### TC7 Vehicle Control Systems and Autonomous Driving

October 18 (Thursday) 17:00~18:30, Birch

Chair: Shi Jingping (Northwestern Polytechnical University, China)

TC7-1	<a href="#">Parameter Estimation for Cooperative Adaptive Cruise Control Design among Heterogeneous Vehicles</a> <i>Hyeon Il Kim, Chang Mook Kang, Dae Jung Kim(Hanyang university, Korea), Chung Choo Chung(Hanyang University, Korea)</i>	N/A
TC7-2	<a href="#">Cooperative Adaptive Cruise Control Using Turn Signal for Smooth and Safe Cut-In</a> <i>Wonshick Ko(KAIST, Korea), Dong Eui Chang(University of Waterloo, Canada)</i>	807
TC7-3	<a href="#">A Plan to Test Automomous Valet Parking Using an Open Source Merkle Tree SW</a> <i>Kangwon Lee(Korea Polytechnic University, Korea)</i>	N/A
TC7-4	<a href="#">On Kinematic Evaluation of Crossing a Junction during Autonomous Valet Parking</a> <i>Kangwon Lee(Korea Polytechnic University, Korea), Eundok Lee, Yunseog Hong(KATRI, Korea)</i>	N/A

## TP-B Poster Session

October 18 (Thursday) 15:20~16:20, Emerald

Chair: Seong Young Ko, Kyoungchul Kong (Chonnam National University, Sogang University, Korea)

TP-B-1	<a href="#">Comparison of Characteristic Information in Gait Vibration</a> <i>Hiroto Ikeshita, Shunsuke Kido, Yuichi Nakamura</i> (National Institute of Technology, Anan College, Japan), <i>Yohei Saika</i> (National Institute of Technology, Gunma College, Japan), <i>Masahiro Nakagawa</i> (Nagaoka University of Technology, Japan)	N/A
TP-B-2	<a href="#">Mean-field Analysis of Bayesian Inference Using Expected A Posterior Estimation of Predicting Comfortable Environments Due to Air Conditioner</a> <i>Yohei Saika</i> (Natl.Inst.Tech.GC, Japan), <i>Masahiro Nakagawa</i> (Nagaoka University of Technology, Japan)	819
TP-B-3	<a href="#">Performance Evaluation of a Beach Cleaning Robot "Hirottaro 3" in an Actual Working Environment</a> <i>Tomoyasu Ichimura</i> (National Institute of Technology, Gunma College, Japan), <i>Shin-ichi Nakajima</i> (Department of Mechanical and Control Engineering, Japan)	825
TP-B-4	<a href="#">Covariance Matrix of a Probability Distribution for Image Dictionaries in Compressed Sensing</a> <i>Toshiaki Aida</i> (Okayama University, Japan)	829
TP-B-5	<a href="#">Study of Measurement Method in Inter-Vehicle Distance Using Hu Moment Invariants</a> <i>Nobuo Sasaki, Takeshi Funatsu</i> (National Institute of Technology, Gunma College, Japan)	833
TP-B-6	<a href="#">Recognizing Human-Object Interactions via Target Localization</a> <i>Sunyoung Cho, Jihun Park, Young Sook Shin, Sang-ho Lee</i> (Agency for Defense Development, Korea)	836
TP-B-7	<a href="#">Water flow Detection Using Deep Convolutional Encoder-decoder Architecture</a> <i>Baris Baydargil, Jang Sik Park</i> (Kyungsoong University, Korea), <i>Hyun Suk Shin</i> (Pusan National University, Korea), <i>Kwang Hee Park</i> (Busan City Hall, Korea)	841
TP-B-8	<a href="#">Human trajectory analysis using LSTM recurrent networks</a> <i>Kyunghoon Cho, Geonho Cha, Hyunki Hong, Beomhee Lee, Songhwai Oh</i> (Seoul National University, Korea)	N/A
TP-B-9	<a href="#">Weakly Supervised Temporal Localization in Video Scene Recognition</a> <i>Junhyuk Hyun, Hongje Seong, Suhyeon Lee, Suhan Woo</i> (Yonsei University, Korea), <i>Euntai Kim</i> (Yonsei Univ., Korea)	N/A
TP-B-10	<a href="#">AI Expert System for the Effective Treadmill Training System of Rehabilitation and Exercise</a> <i>Minsu Chang</i> (Sogang University, Korea), <i>Doyoung Jeon</i> (Sogang university, Korea)	N/A
TP-B-11	<a href="#">Button Filtering for Converting Image to Coordinates of Swarming Drones</a> <i>Inhwan Wee, Dasol Lee, David Hyunchul Shim</i> (KAIST, Korea)	850
TP-B-12	<a href="#">Partial Agreement Task Assignment Algorithm for Secure Plan Consensus in Multi-Agent System</a> <i>Ho-Yeon Kim, Han-Lim Choi</i> (KAIST, Korea)	856
TP-B-13	<a href="#">Convolutional Neural Networks for Analyzing Unmanned Aerial Vehicles Sound</a> <i>Eric Matson</i> (Purdue University, United States)	862

TP-B-14	<a href="#">Auto-Tuning Altitude Controller with Steepest Gradient Descent Algorithm for Quadrotors</a> <i>Hee do Kim, Byeong seon Yu, Chae rin Lee, Seok-Kyoon Kim(Hanbat National University, Korea)</i>	867
TP-B-15	<a href="#">Analysis for VTOL and Fixed-wing Flight Software of PX4</a> <i>Jong Tai Jang, Sanghyuck Han(Korea Aerospace Research Institute (KARI), Korea)</i>	872
TP-B-16	<a href="#">Autonomous Landing of UAV Using Vision Based Approach and PID Controller Based Outer Loop</a> <i>Taemin Shim, Hyochoong Bang(KAIST, Korea)</i>	876
TP-B-17	<a href="#">Intermediate Result of A Hybrid Drone Development and Control</a> <i>Jong Tai Jang, Doyoon Kim, Sanghyuck Han(Korea Aerospace Research Institute (KARI), Korea)</i>	N/A
TP-B-18	<a href="#">Development of Remotely Operated Underwater Vehicle for Autonomous Underwater Intervention</a> <i>Yoongeon Lee(Korea Research Institute of Ships &amp; Ocean Engineering, Korea), Yeongjun Lee(Korea Research Institute of Ships &amp; Ocean engineering, Korea), Junbo Chae, Hyun-Taek Choi, Tae-Kyeong Yeu(Korea Research Institute of Ships &amp; Ocean Engineering, Korea)</i>	N/A
TP-B-19	<a href="#">3D Mobile Robot Localization Aided by Point Cloud Keypoint Features and Three-Dimensional Localization (KEFT)</a> <i>Vinicio Rosas-Cervantes(Kyung Hee University, Ecuador)</i>	N/A
TP-B-20	<a href="#">The Development of Collection and Evaluation Environment for Human Factors Research in Automated Driving</a> <i>Youngdal Oh(Korea Automotive Technology Institute, Korea), Hee-hyol Lee(Waseda University, Japan), Dongwoon Ryu, Sunhong Park(Korea Automotive Technology Institute, Korea)</i>	N/A
TP-B-21	<a href="#">Fuel-Conscious Launching Control for Autonomous Hybrid Electric Vehicle</a> <i>Donggyun Kim, Junyoung Kim, Changsun Ahn(Pusan National University, Korea)</i>	N/A
TP-B-22	<a href="#">Orienting Head-Truck in the Design of Truck-Trailer Path Following Control</a> <i>Augie Widyotriatmo(Institut Teknologi Bandung (ITB), Indonesia)</i>	891
TP-B-23	<a href="#">Fatigue characteristics of surface electromyography during walking</a> <i>Seulki Kyeong, Jung Kim(KAIST, Korea)</i>	897
TP-B-24	<a href="#">A Study on the Development of a Day-to-Day Mental Stress Monitoring System using Personal Physiological Data</a> <i>Jongwoo Park(Ulsan National Institute of Science and Technology, Korea)</i>	900
TP-B-25	<a href="#">Assessment of beta-cell function based on dose response function and potentiation factor based on mathematical modeling</a> <i>Min Hyuk Lim, Woo Hyung Lee(Seoul National University, Korea), Young Min Cho(Seoul National University Hospital, Korea), Sungwan Kim(Seoul National University, Korea)</i>	N/A
TP-B-26	<a href="#">Brief review on the principle implementation of P-Controller by DSD circuits</a> <i>Rong Peng, Takashi Nakakuki(Kyushu Institute of Technology, Japan)</i>	N/A
TP-B-27	<a href="#">A Simulation-based Design of Ankle Assistive Robot for Tripping Prevention of Elderly People</a> <i>Duhyun Han(Sogang University, Korea)</i>	N/A
TP-B-28	<a href="#">Effects of a Powered Hip Exoskeleton on Whole Body during Lifting</a> <i>Yoosuk Kim, Sungwon Shin, Kyoungchul Kong(Sogang University, Korea)</i>	N/A

TP-B-29	<a href="#">Human Model Based Exoskeleton Simulation for Walking Motion</a> <u>Mingoo Jeong</u> , Hanseung Woo, Kyoungchul Kong(Sogang University, Korea)	N/A
TP-B-30	<a href="#">Leg design use topology optimization with optimal mass-stiffness ratio for high-speed running of legged robots</a> <u>Seoungho Youn</u> (Sogang University, Korea), Yeongsik Seo(Sogang university, Korea), Jungsoo Cho(Sogang university, Korea), Kyoungchul Kong(Sogang university, Korea)	N/A
TP-B-31	<a href="#">Analysis of vibrations transmitted to the quadruped robot body during trotting with different foot stiffness</a> <u>Hyunjune Song</u> , Kyoungchul Kong(Sogang University, Korea)	N/A
TP-B-32	<a href="#">Retractable cleat mechanism of legged robots' foot on various terrain</a> <u>Huiseok Moon</u> , Jungsoo Cho, Kyoungchul Kong(Sogang University, Korea)	918
TP-B-33	<a href="#">Muscle Synergy Measurement for Rehabilitation of Stroke Patient</a> Hoeryong Jung, <u>Jung Hwan Lim</u> (Konkuk University, Korea)	N/A
TP-B-34	<a href="#">Fishing Line Spring Based Tendon for Concealed Ankle Brace</a> <u>Seungjun Lee</u> , Yeongjin Kim, Sanghee Lee, Hyunho Kim, Sang-Hun Jung(Incheon National University, Korea), Sangjoon J. Kim, Kyungseo Park(Korea Advanced Institute of Science and Technology, Korea)	924
TP-B-35	<a href="#">Step length adaptable active ankle foot orthosis for drop foot patients</a> <u>Dongwoo Nam</u> , Bummo Ahn(UST / Korea Institute of Industrial Technology, Korea)	N/A
TP-B-36	<a href="#">Quantitative performance evaluation of EMG control algorithm for grasping tasks</a> <u>Junghoon Park</u> (KAIST, Korea), Youngjin Na(Sookmyung Women's University, Korea)	N/A
TP-B-37	<a href="#">A Novel Shape Deforming Large-scale Flexible Sensor for Tactile Display</a> <u>Sang-Hun Jung</u> , Young-Jin Kim(Incheon National University, Korea)	931
TP-B-38	<a href="#">Planar Trajectory Following Control with a Curvature-Controllable Steerable Needle: Preliminary Modeling and Simulation</a> <u>Binxian Xu</u> , Seong Young Ko(Chonnam National University, Korea)	935
TP-B-39	<a href="#">A novel friction-based shape locking method for tendon actuated manipulators</a> <u>Muhammad Umar Farooq</u> , Seong Young Ko(Chonnam National University, Korea)	N/A
TP-B-40	<a href="#">Flexible Endoscopic Surgery Robot System, K-FLEX</a> <u>Minho Hwang</u> , Dong-Ho Lee, Jeongdo Ahn, Jaemin You, Donghoon Baek, Hansoul Kim(Korea Advanced Institute of Science and Technology (KAIST), Korea), Roxana Rassouli Kirchmeier(Radboud University Medical Center, Netherlands), Dong-Soo Kwon(Korea Advanced Institute of Science and Technology (KAIST), Korea)	N/A
TP-B-41	<a href="#">A Tendon-Driven Mechanism of the Bending Joints Based on Differential Gears</a> <u>Kiyoung Kim</u> (KIMM, Korea), Jungwook Suh(ETRI, Korea), Hyun Soo Woo(KIMM, Korea)	942
TP-B-42	<a href="#">Actuation System of the MR-Compatible Multi-DOF Surgical Robot manipulator</a> <u>Sungmin Seung</u> , Kyoungrae Cha(Daegu-Gyeongbuk Medical Innovation Foundation, Korea)	945
TP-B-43	<a href="#">Refrigerant charge estimation for an air conditioning system using artificial neural network modelling</a> <u>Jung Eun Son</u> , Seoyoung Nam, Kyungwon Kang, Joongbeom Lee(LG Electronics, Korea)	951
TP-B-44	<a href="#">Improvement of Extended Kalman Filter Using Invariant Extended Kalman Filter</a> <u>Nak Yong Ko</u> (Chosun University, Korea), Gyeong Sub Song(Chosun Univ., Korea), Wonkeun Youn, In Ho Choi, Tae Sik Kim(Korea Aerospace Research Institute, Korea)	948



TP-B-45	<a href="#">Stability Evaluation of Outdoor Unmanned Security Robot in Terrain Information</a> <a href="#">Ji-Hyun Park</a> , <a href="#">Tae-Young Uhm</a> , <a href="#">Gi-Deok Bae</a> , <a href="#">Young-Ho Choi</a> (KIRO, Korea)	955
TP-B-46	<a href="#">A Following System for a Specific Object Using a UWB System</a> <a href="#">Tae Gyun Kim</a> (Company, Korea)	958

### TP-C Poster Session

October 18 (Thursday) 16:20~17:20, Emerald

Chair: Dong Il Park, Dong Jun Lee (Korea Institute of Machinery and Materials, Seoul National University, Korea)

TP-C-1	<a href="#">A Study of Test Method of Powered Exoskeleton Robots focused on Physical Fitness Improvement</a> <a href="#">Seungsub Oh</a> , <a href="#">Jeongwoo Park</a> , <a href="#">Jehun Hahm</a> (Korea Institute of Robot and Convergence, Korea), <a href="#">Jaeho Jang</a> , <a href="#">Hyunchul Kong</a> , <a href="#">Younghwan Hong</a> , <a href="#">Dongmin Kim</a> (FRT, Inc., Korea), <a href="#">Jinho Suh</a> (Korea Institute of Robot and Convergence, Korea)	N/A
TP-C-2	<a href="#">Control Model of Electrostatic Rotary Actuator</a> <a href="#">Jemin Woo</a> , <a href="#">Changsun Ahn</a> (Pusan National University, Korea), <a href="#">Bongsu Hahn</a> (Kyungil University, Korea)	N/A
TP-C-3	<a href="#">A Robust Control Methodology based on Active Disturbance Rejection Control and Input Shaping</a> <a href="#">Qingru Hua</a> , <a href="#">Yali Xue</a> (Tsinghua University, China), <a href="#">Donghai Li</a> (Tsinghua Univ, China), <a href="#">Li Sun</a> , <a href="#">Yuhui Jin</a> (Southeast University, China)	968
TP-C-4	<a href="#">Adaptive slip engagement control of a dry clutch using a clutch torque estimator</a> <a href="#">Jinrak Park</a> , <a href="#">Seibum Choi</a> (KAIST, Korea), <a href="#">Jiwon Oh</a> , <a href="#">Jeongsoo Eo</a> (Hyundai Motor Group, Korea)	974
TP-C-5	<a href="#">Uncertainty and Disturbance Estimator-Based Tracking Control for Fuzzy Systems</a> <a href="#">Selvaraj Palanisamy</a> (Chungbuk National University, Korea), <a href="#">Kaviarasan Boomipalagan</a> (Anna University University Regional Campus, India), <a href="#">Seung-Hoon Lee</a> , <a href="#">Oh-Min Kwon</a> (Chungbuk National University, Korea)	980
TP-C-6	<a href="#">SMCSPO Robust Control Simulation of Heart Rate for Cardiac Rehabilitation in Treadmill Exercise</a> <a href="#">Hyun Hee Kim</a> , <a href="#">Min Cheol Lee</a> (Pusan National University, Korea)	N/A
TP-C-7	<a href="#">Second order Terminal Sliding Mode Control with Smooth Input for DC Motor Systems</a> <a href="#">ByungYun Jin</a> , <a href="#">Duse Lee</a> , <a href="#">Kangbak Park</a> (Korea University, Korea)	N/A
TP-C-8	<a href="#">Heart Rate Modeling Using Signal compression Method During Treadmill Exercise</a> <a href="#">Hwanyoung Kim</a> , <a href="#">Min Cheol Lee</a> (Pusan National University, Korea)	N/A
TP-C-9	<a href="#">Output Error Identification in the Presence of Structural Disturbances</a> <a href="#">Amir H. Shirdel</a> , <a href="#">Jari M. Boling</a> , <a href="#">Hannu T. Toivonen</a> (Åbo Akademi University, Finland)	992
TP-C-10	<a href="#">Safe Flight Envelope Estimation for Rotorcraft: A Reachability Approach</a> <a href="#">Yoonsoo Kim</a> , <a href="#">Hendra Harno</a> (Gyeongsang National University, Korea)	998
TP-C-11	<a href="#">UWSNs-based Distributed Trespasser Tracking System for a Fish Farm</a> <a href="#">Chang Ho Yu</a> , <a href="#">Jae Weon Choi</a> (Pusan National University, Korea)	1003
TP-C-12	<a href="#">Adaptive observer for linear descriptor systems in discrete-time</a> <a href="#">Woogyong Kwon</a> (POSCO, Korea), <a href="#">Kee-Young Shin</a> (POSCO Technical Research LABs, Korea)	1008



TP-C-13	Simulation study for validation of separated torque-based regression method for parameter identification <u>Dawoon Jung</u> (Korea University, Korea), <u>Joono Cheong</u> (Korea University (Sejong), Korea)	N/A
TP-C-14	Parameter Estimation and LuGre Friction Model <u>Yong Woo Jeong</u> , <u>Seung-Hi Lee</u> , <u>Chung Choo Chung</u> (Hanyang University, Korea)	N/A
TP-C-15	Solvability for a class of nonlinear fractional differential equations with parameters <u>Yuanyao Pan</u> , <u>Xinyi Hou</u> , <u>Yige Zhao</u> (University of Jinan, China)	1019
TP-C-16	Performance/Robustness Improvement of i-PID with Two-Degree-of-Freedom Controller <u>YeonWook Choe</u> (Pukyong National University, Korea)	1024
TP-C-17	Stability of switched positive homogeneous nonlinear systems with mode-dependent average dwell time <u>Yazhou Tian</u> , <u>Yuangong Sun</u> (University of Jinan, China)	1030
TP-C-18	Prediction of commercial building lighting energy consumption based on EPSO-BP <u>Guorong Sha</u> (Nanjing Institute of Industry and Technology, China), <u>Qing Qian</u> (Nanjing University of Technology, China)	1035
TP-C-19	Necessary and Sufficient Condition for Reachable Set Estimation of Nonlinear Positive Systems with Time-Varying Delay <u>Xingao Zhu</u> , <u>Yanhao Ju</u> , <u>Yuangong Sun</u> (University of Jinan, China)	1041
TP-C-20	Short-term subway human flow forecast based on the GM-BP prediction model <u>Guorong Sha</u> (Nanjing Institute of Industry and Technology, China), <u>Qing Qian</u> (Nanjing University of Technology, China)	1046
TP-C-21	EPPY based Building Co-Simulation for MPC of HVAC Optimization <u>Daniel Lee</u> , <u>Ming Chong Lim</u> , <u>Lebsework Negash</u> , <u>Han-Lim Choi</u> (KAIST, Korea)	1051
TP-C-22	Time Delay Compensating Reference Generation for Metro Precision Stop Control <u>Seungyeop Lee</u> , <u>Yongsoon Eun</u> (DGIST, Korea)	N/A
TP-C-23	Observer-based state feedback control of an intelligent crane <u>Hai Nguyen Duc</u> , <u>Nguyen Van Sy</u> , <u>Kwan-Woong Gwak</u> (Sejong University, Korea)	N/A
TP-C-24	FEEDBACK CONTROLLER DESIGN OF CABLE-DRIVEN PARALLEL ROBOT FOR 3D PRINTING BUILDING CONSTRUCTION <u>Ta Duc Hai</u> (Sejong University, Korea), <u>Chang-Hwan Lee</u> , <u>Chi Hong Park</u> (Sejong university, Korea), <u>Hai Nguyen Duc</u> , <u>Nguyen Van Sy</u> , <u>Kwan-Woong Gwak</u> (Sejong University, Korea)	N/A
TP-C-25	Stability analysis of continuous-time positive switched linear systems <u>Yanhao Ju</u> , <u>Xingao Zhu</u> , <u>Yuangong Sun</u> (University of Jinan, China)	1062
TP-C-26	Gain Tuning of Two-Loop PID Controller with FRIT for Fluctuation Suppression on Floating Offshore Wind Turbines <u>Takashi Ichikawa</u> , <u>Naoyuki Hara</u> , <u>Keiji Konishi</u> (Osaka Prefecture University, Japan)	N/A
TP-C-27	I-PD Control with Second-order Differential and Reference Signal Shaping for a Flexible Beam <u>Yuki Nishioka</u> , <u>Jun Imai</u> , <u>Akiko Takahashi</u> , <u>Shigeyuki Funabiki</u> (Okayama University, Japan)	N/A
TP-C-28	A Categorizing Scheme of the Security Controls based on the Attack Pathway and Asset Type for I&C Systems in Operating NPPs <u>Sooill Lee</u> , <u>Yongsik Kim</u> (KHNP Central Research Institute, Korea)	N/A

TP-C-29	<a href="#">Compensation Method of Gyroscope Bias Hysteresis Error with Temperature and Rate of Temperature using Deep Neural Networks</a> <i>Yeong-Bin Seo</i> (University of Science and Technology, Korea), <i>Haesung Yu</i> (Agency for Defense Development, Korea), <i>Myeong-Jong Yu</i> (University of Science and Technology, Korea), <i>Sang Jeong Lee</i> (Chungnam National University, Korea)	1072
TP-C-30	<a href="#">Terrain field SLAM and Uncertainty Mapping using Gaussian Process</a> <i>Hyeonwoo Yu</i> , <i>Beomhee Lee</i> (Seoul National University, Korea)	1077
TP-C-31	<a href="#">Zero velocity detection algorithm based on estimated velocity value</a> <i>Huu Toan Duong</i> , <i>Young Soo Suh</i> (University of Ulsan, Korea)	N/A
TP-C-32	<a href="#">Efficient Scene Recognition for Sensor-Fusion-based SLAM</a> <i>Jungho Kim</i> (Korea Electronics Technology Institute, Korea)	N/A
TP-C-33	<a href="#">GPS/GLONASS Positional Performance Improvement by using MSAS and SDCM</a> <i>Mingyou Cho</i> , <i>Jaejin Han</i> (Danam systems, Korea), <i>Juno Kim</i> , <i>Yunchel Cho</i> , <i>JaeGun Choi</i> (Agency for Defense Development, Korea)	N/A
TP-C-34	<a href="#">Low-Cost Software-Defined GPS Simulator with the Capability of Time Synchronization</a> <i>Woohyun Kim</i> , <i>Jiwon Seo</i> (Yonsei University, Korea)	1087
TP-C-35	<a href="#">Development of multi-purpose device to teach robot and detect intruder</a> <i>Taeyong Choi</i> , <i>Hyunmin Do</i> , <i>Hwisu Kim</i> , <i>Dong Il Park</i> (KIMM, Korea), <i>Uikyum Kim</i> (Korea Institute fo Machinery & Materials, Korea)	N/A
TP-C-36	<a href="#">Design of the Gravity Compensation Mechanism for the Variable Payload</a> <i>Myeong Su Bae</i> , <i>Hwisu Kim</i> , <i>Dong Il Park</i> , <i>Chanhoo Park</i> , <i>Hyung Min Ji</i> , <i>Jinho Kyung</i> , <i>Doohyung Kim</i> (Korea Institute of Machinery & Materials, Korea)	N/A
TP-C-37	<a href="#">Analysis of Inertial Effect on Control Performance of a Time-delayed Controller for a Robot Manipulator</a> <i>Seul Jung</i> (Chungnam National University, Korea)	1096
TP-C-38	<a href="#">Preliminary Design of a Novel Robotic Surgical Instrument with 4-DOF Parallel Mechanism</a> <i>Uikyum Kim</i> (Korea Institute fo Machinery & Materials, Korea), <i>Young Uk Jin</i> , <i>Hyouk Ryeol Choi</i> (Sungkyunkwan University, Korea)	N/A
TP-C-39	<a href="#">Power Signal Classification with Combinational Spectrogram-based CNN for Embedded System Health Management</a> <i>Heoncheol Lee</i> , <i>Yongsung Kwon</i> , <i>Kipyo Kim</i> (Agency for Defense Development, Korea)	1102
TP-C-40	<a href="#">Fuzzy Logic and Deep Steering Control based Recommendation System for Self-Driving Car</a> <i>Nam Van Dinh</i> , <i>Gon Woo Kim</i> (Chungbuk National University, Korea)	1107
TP-C-41	<a href="#">A Machine Learning Approach on Autonomous Structure Inspection</a> <i>Alex Junho Lee</i> , <i>Giseop Kim</i> , <i>Lucas Younghun Cho</i> , <i>Hyesu Jang</i> , <i>Ayoung Kim</i> (KAIST, Korea)	N/A
TP-C-42	<a href="#">Development of a modular intelligent care capsule robot for the elderly in response to an aging society with a light actuator</a> <i>Seungho Kim</i> (KAERI, Korea)	1113
TP-C-43	<a href="#">Development of a Transformable Self-Balancing Mobile Robot</a> <i>Hyun Myung</i> (KAIST, Korea), <i>Yongjae Kim</i> (Korea University of Technology and Education(Koreatech), Korea), <i>Jinkwang Kim</i> (KAIST, Korea), <i>Geonhoo Kim</i> , <i>Taewoo Han</i> , <i>Seungwon Heo</i> (Korea University of Technology and Education(Koreatech), Korea)	1117

TP-C-44	<a href="#">Design of a dynamic joint impedance measurement system</a> <i>Wonseok Shin, Jung Kim(KAIST/Mechanical Engineering, Korea)</i>	1123
TP-C-45	<a href="#">Development of a neuron-inspired tactile information processing model</a> <i>Minkook Choi, Jaehun Kim, Taeyang Yang, Jisung Park, Ji-Hyun Kim, Sung-Phil Kim(UNIST, Korea)</i>	1126
TP-C-46	<a href="#">Cortical activation during voluntary and passive movement of human index finger</a> <i>Usman Ghafoor(Pusan National university, Korea), Amad Zafar, Keum-Shik Hong(Pusan National University, Korea)</i>	1129
TP-C-47	<a href="#">Determination of the parameters in the designed hemodynamic response function using Nelder-Mead algorithm</a> <i>Amad Zafar(Pusan National University, Korea), Usman Ghafoor(Pusan National university, Korea), M. Atif Yaqub, Keum-Shik Hong(Pusan National University, Korea)</i>	1135
TP-C-48	<a href="#">Classification three categories from prefrontal cortex using LSTM networks: fNIRS study</a> <i>So-hyeon Yoo, Seong-Woo Woo, Amad Zafar, Keum-Shik Hong(Pusan National University, Korea)</i>	1141
TP-C-49	<a href="#">Classification of stress and non-stress condition using functional near-infrared spectroscopy</a> <i>Seong-Woo Woo, Keum-Shik Hong(Pusan National University, Korea)</i>	1147
TP-C-50	<a href="#">Comparison of Kernels in Online SVM Classification of fNIRS Data</a> <i>Ruisen Huang, Keum-Shik Hong(Pusan National University, Korea)</i>	1152
TP-C-51	<a href="#">Development of a High Density Neuroimaging System Using Functional Near-Infrared Spectroscopy</a> <i>M. Atif Yaqub, Amad Zafar(Pusan National University, Korea), Usman Ghafoor(Pusan National university, Korea), Keum-Shik Hong(Pusan National University, Korea)</i>	1158

### FA1 ECTI-ICROS Organized Session on Advances of Control System Design

October 19 (Friday) 09:10~10:40, Sapphire

Chair: David Banjerdpongchai (Chulalongkorn University, Korea)

FA1-1	<a href="#">The Multi-agent Rendezvous using Gossip and Consensus Algorithms: Directed Bipartite Connection</a> <i>Hong-Kyong Kim, Younghun John, Hyo-Sung Ahn(GIST, Korea)</i>	1164
FA1-2	<a href="#">Development of a Drilling Robot that Mimics Mole Digging Pattern</a> <i>Hyun Myung, Jong Heon Kim, Christian Tirtawardhana(KAIST, Korea)</i>	N/A
FA1-3	<a href="#">Yawing Motion Control of a Single-Wheel Robot Actuated by a Control Moment Gyroscope</a> <i>Hyun W Kim, Seul Jung(Chungnam National University, Korea)</i>	N/A
FA1-4	<a href="#">Multi-PLC Control System Based on Wireless Bridge/Base Stations for Work-in-Process Movements in Corrugated Box Manufacturer</a> <i>Krit Smerpitak, Woravut Jearnpanitpong, Amphawan Julsereewong, Teerawat Thepmanee(King Mongkut's Institute of Technology Ladkrabang (KMITL), Thailand)</i>	1175
FA1-5	<a href="#">Design of Output Feedback Nonlinear Model Predictive Control for Inverted Pendulum on Cart</a> <i>Petchakrit Pinyopawasutthi, David Banjerdpongchai(Chulalongkorn university, Thailand), Oishi Yasuaki(Nanzan University, Japan)</i>	1181
FA1-6	<a href="#">A Prototype System to Count Nursery Pacific White Shrimp using Image Processing</a> <i>Sungwan Bokuwan, Sumit Panaudomsup, Thepjit Cheypoca(King Mongkut's Institute of Technology Ladkrabang, Thailand)</i>	1187

### FA2 Application of Multimodal Signal Processing

October 19 (Friday) 09:10~10:40, Crystal

Chair: Hyuntae Kim (Donguei University, Korea)

FA2-1	<a href="#">Number Recognition of Parts Book Schematics using Convolutional Recurrent Neural Network</a> <i>Erdal Genc, Hee Ran Shin, Jang Sik Park, Jong Kwan Song(Kyungsung Univ., Korea)</i>	1190
FA2-2	<a href="#">Contour Segmentation Based on Density Gradient and Region Growing</a> <i>Yang Yu, Kang-Hyun Jo(University of Ulsan, Korea)</i>	N/A
FA2-3	<a href="#">Clustering for Electronic Warfare Information</a> <i>Eren Yıldırım, Yucel Batu Salman(Bahcesehir University, Turkey), Jang Sik Park(Kyungsung University, Korea)</i>	1195
FA2-4	<a href="#">Reduction of background sound based on non-negative matrix factorization combined with Wiener filter post-processing</a> <i>Jang Sik Park(Kyungsung University, Korea)</i>	N/A

### FA3 Translational Rehabilitation Robots - Upper Extremity

October 19 (Friday) 09:10~10:40, Ruby

Chair: Won-Kyung Song (National Rehabilitation Center, Korea)

- |       |   |     |
|-------|---|-----|
| FA3-1 | <a href="#">The Effect of assistive force of rehabilitation robot on upper extremity function in stroke patients : a single blinded randomized trial</a><br><u>Joon-Ho Shin</u> (National Rehabilitation Center, Korea) | N/A |
| FA3-2 | <a href="#">A robot for impedance estimation of human upper limb</a><br><u>Sang Hoon Kang</u> , <u>Hyunah Kang</u> (UNIST, Korea)   | N/A |
| FA3-3 | <a href="#">Model-based Assessment of Reaching Task for Individualized Robotic Training</a><br><u>Jonghyun Kim</u> (DGIST, Korea)   | N/A |
| FA3-4 | <a href="#">Shoulder Rehabilitation Robot</a><br><u>Hyung-Soon Park</u> (KAIST, Korea)  | N/A |
| FA3-5 | <a href="#">Comparison of Reach Exercise in Chronic Stroke Survivors via High/Low Inertia Upper Extremity Rehabilitation Robots</a><br><u>Won-Kyung Song</u> (National Rehabilitation Center, Korea)                    | N/A |

### FA4 Advances in Process Control and Optimization

October 19 (Friday) 09:10~10:40, Opal

Chair: Jong Min Lee (Seoul National University, Korea)

- |       |  |      |
|-------|--|------|
| FA4-1 | <a href="#">Model development for prediction of stress-induced lipid accumulation from cell condition</a><br><u>Seung Hwan Oh</u> , <u>Jay H Lee</u> (KAIST, Korea)  | N/A  |
| FA4-2 | <a href="#">Multi-objective Optimal Operation Strategy for Cellulosic Biobutanol Fermentation with Ex Situ Butanol Recovery (ESBR)</a><br><u>Ha Eun Byun</u> , <u>Boeun Kim</u> , <u>Jay H Lee</u> (KAIST, Korea)  | N/A  |
| FA4-3 | <a href="#">Construction of a shortcut model for amine scrubbing CO2 capture process</a><br><u>Wonseok Chung</u> , <u>Jay H Lee</u> (KAIST, Korea)   | N/A  |
| FA4-4 | <a href="#">Multiple Tube Model Predictive Control with Decomposed Disturbance Subsets Approach for Less Conservative Control of Worst-Case Cost</a><br><u>Tae Hoon Oh</u> (Seoul National University, Korea), <u>Jong Min Lee</u> (School of Chemical and Biological Engineering, Institute of Chemical Processes, Korea) | 1226 |
| FA4-5 | <a href="#">Computer-Aided Process Design for Membrane Networks Systems</a><br><u>Sunghoon Lee</u> , <u>Jin-Kuk Kim</u> (Hanyang University, Korea)  | N/A  |
| FA4-6 | <a href="#">Process Integration and Optimization for Absorption-Based CO2 Capture Systems</a><br><u>Seokwon Yun</u> , <u>Jin-Kuk Kim</u> (Hanyang University, Korea)   | N/A  |
| FA4-7 | <a href="#">Bayesian Parameter Estimation in Nonlinear Differential Equations Using Automatic Differentiation</a><br><u>Damdae Park</u> , <u>Seongeon Park</u> , <u>Jung Hun Kim</u> (Seoul National University, Korea), <u>Jong Min Lee</u> (Institute of Chemical Processes, Seoul National University, Korea)           | 1239 |

### FA5 Control Applications

October 19 (Friday) 09:10~10:40, Red Pine

Chair: Carlos Humberto Cuadra (Akita Prefectural University, Japan)

- |       |  |      |
|-------|--|------|
| FA5-1 | <a href="#">Nondestructive Survey of a Historical Wooden Construction Using Thermography and Ambient Vibration Measurements</a>                                      | 1245 |
|       | <i>Carlos Humberto Cuadra, Nobuhiro Shimoi(Akita Prefectural University, Japan)</i>  |      |
| FA5-2 | <a href="#">Structural Damage Detection in a Steel Column-Beam Joint Using Piezoelectric Sensors</a>   | 1250 |
|       | <i>Carlos Humberto Cuadra, Nobuhiro Shimoi(Akita Prefectural University, Japan)</i>  |      |
| FA5-3 | <a href="#">Robust optimization of the production profile of the steam assisted gravity drainage reservoir using a polynomial chaos expansion-based proxy model</a>  | 1254 |
|       | <i>Ajay Ganesh(University of Alberta, Canada)</i>  |      |
| FA5-4 | <a href="#">Evaluating Successive Linearization in NMPC for Controlling Oscillations in Boiling Channel</a>  | 1260 |
|       | <i>Koustav Roy, Swapan Paruya, Jyoti Bhati(National Institute of Technology, Durgapur, India)</i>  |      |
| FA5-5 | <a href="#">Basics of creating platforms for automation of business processes of logistics</a>   | 1265 |
|       | <i>Raissa Kabievna Uskenbayeva, Abu Abdikadyrovich Kuandykov, Sabina Batyrkhanovna Rakhmetulayeva, Aigerim Bolshibayeva(International IT University, Kazakhstan)</i> |      |

### FA6 Industrial Applications of Control I

October 19 (Friday) 09:10~10:40, Azalea

Chair: Seyed Hossein Hosseini (University of Tabriz, Iran)

- |       |  |      |
|-------|--|------|
| FA6-1 | <a href="#">A New Multi-Input Multi-output DC-DC Bidirectional Converter with MPPT Control Applicable for PV</a>   | 1272 |
|       | <i>Seyed Hossein Hosseini, Zahra Saadatizadeh, Pedram Chavoshpour Heris(University of Tabriz, Iran, Islamic Republic of)</i>   |      |
| FA6-2 | <a href="#">Development of Predictive Control System Using Just-In-Time Modeling and Enthalpy-Aware Control in Air Conditioners for Large-Scale Data Center</a>  | 1278 |
|       | <i>Hiroshi Endo, Shigeto Suzuki(Fujitsu laboratories Ltd., Japan), Hiroyoshi Kodama(Fujitsu Laboratories Ltd., Japan), Takeshi Hatanaka(Osaka University, Japan), Hiroyuki Fukuda(Fujitsu Laboratories Ltd., Japan), Masayuki Fujita(Tokyo Institute of Technology, Japan)</i> |      |
| FA6-3 | <a href="#">Maximum Power Point Tracking Control for Photovoltaic Generation Using Quasi-Continuous Sliding Mode Control</a>   | 1284 |
|       | <i>Yoonmo Sung(Hanyang University, Korea), Chunghun Kim(Kyungpook University, Korea), Chung Choo Chung(Hanyang University, Korea)</i>  |      |
| FA6-4 | <a href="#">A Design of Automated Inspections of Both Shape and Height Simultaneously Based on Stereo Vision and PLC</a>   | 1290 |
|       | <i>Wittaya Koodtalang, Thaksin Sangsuwan, Burapa Noppakaow(King Mongkut's University of Technology North Bangkok, Thailand)</i>  |      |

FA6-5	<a href="#">Research on Vibration Characteristics of Spur Gear System with Pitting Fault Considering the Elastohydrodynamic Lubrication Condition</a> <i>Chunlong Deng, Hongling Zheng, Yimin Shao(Chongqing University, China)</i>	1295
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#### FA7 Navigation and Its Applications

October 19 (Friday) 09:10~10:40, Birch

Chair: Hyung Keun Lee (Korea Aerospace University, Korea)

FA7-1	<a href="#">A Comparison between Stereo and Time-Differential Depth estimation for Vision/GPS/INS</a> <i>Yu Dam Lee, Hyung Keun Lee(Korea Aerospace University, Korea)</i>	N/A
FA7-2	<a href="#">Noise Covariance Adaptation of Doppler Velocity Log Considering Vehicle's Attitude</a> <i>Jaehyuck Cha(Seoul National University, Korea), Hojin Ju(Automation and Systems Research Institute, Korea), Chan Gook Park(Seoul National University, Korea), Kijeong Yoo, Chanju Park(Agency for Defense Development, Korea)</i>	1303
FA7-3	<a href="#">Pedestrian Dead Reckoning System Using Dual IMU to Consider Heel Strike Impact</a> <i>Hojin Ju(Automation and Systems Research Institute, Korea), Jae Hong Lee, Chan Gook Park(Seoul National University, Korea)</i>	1307
FA7-4	<a href="#">Vehicle Localization Using Road Marking Image Matching</a> <i>Yeong-Dong Choi(Konkuk University, Korea)</i>	1310

#### FB1 Machine Vision Applications I

October 19 (Friday) 13:30~15:00, Sapphire

Chair: Sungho Kim (Yeungnam University, Korea)

FB1-1	<a href="#">Chinese character detection using modified Single Shot Multibox Detector</a> <i>Junhwan Ryu, Sungho Kim(Yeungnam University, Korea)</i>	1313
FB1-2	<a href="#">Automatic Sketch Colorization using DCGAN</a> <i>Hwan Heo, Youngbae Hwang(Korea Electronics Technology Institute, Korea)</i>	1316
FB1-3	<a href="#">3D Human Pose Estimation Network Using Voxel Data</a> <i>Han-Mu Park, Ju Hong Yoon(Korea Electronics Technology Institute, Korea), Youngbae Hwang(KETI, Korea)</i>	N/A
FB1-4	<a href="#">Cost-function evaluation for intensity-based 2D-3D registration of broken femur bone</a> <i>Asaduz Zaman, Seong Young Ko(Chonnam National University, Korea)</i>	N/A
FB1-5	<a href="#">A License Plate Recognition using Neural Network and Autonomous Mobile Robot in Intelligent Parking Lot Management System</a> <i>Wangheon Lee(Hansei University, Korea)</i>	1325

#### FB2 Signal and Image Processing I

October 19 (Friday) 13:30~15:00, Crystal

Chair: Hyoungseop Kim (Kyushu Institute of Tecnology, Japan)



FB2-1	<a href="#">Enhancement of Bone Metastasis from CT Images Based on Salient Region Feature Registration</a> <i>Suguru Sato, Hyoungeop Kim(Kyusyu Institute of Technology, Japan)</i>	1329
FB2-2	<a href="#">Detection of Abnormal Shadows on Temporal Subtraction Images Based on Multi-phase CNN</a> <i>Mitsuaki Nagao, Hyoungeop Kim(Kyushu Institute of Technology, Japan)</i>	1333
FB2-3	<a href="#">Detection of Phalange Region Based on U-Net</a> <i>Kazuhiro Hatano, Hyoungeop Kim(Kyushu Institute of Technology, Japan)</i>	1338
FB2-4	<a href="#">Swallowing Motion Analyzing from Dental MR Imaging Based on AKAZE and Particle Filter Algorithm</a> <i>Kenta Suetani, Hyoungeop Kim(Kyushu Institute of Technology, Japan)</i>	1343
FB2-5	<a href="#">Extraction of Median Plane from Facial 3D Point Cloud Images Based on ICP Algorithm</a> <i>Shinji Yamada, Hyoungeop Kim(Kyushu Institute of Technology, Japan)</i>	1347

### FB3 Translational Rehabilitation Robots - Lower Extremity

October 19 (Friday) 13:30~15:00, Ruby

Chair: Won-Kyung Song (National Rehabilitation Center, Korea)

FB3-1	<a href="#">Gait analysis in hemiplegic stroke survivors with one-arm motorized walker</a> <i>Kihun Cho(Korea National University of Transportation, Korea), <u>DongGeon Lee</u>(Kyungnam University, Korea)</i>	N/A
FB3-2	<a href="#">Power Assistance and Evaluation of an End-effector Typed Walking Rehabilitation Robot</a> <i>Jung-Yup Kim(Seoul National University of Science and Technology, Korea)</i>	1353
FB3-3	<a href="#">Data Acquisition and Coaching of Gait Rehabilitation</a> <i>Suncheol Kwon(National Rehabilitation Center, Korea)</i>	N/A
FB3-4	<a href="#">Novel Pathway of R&amp;D of care robotic devices in Korea</a> <i>Myung Joon Lim(National Rehabilitation Center, Korea)</i>	N/A

### FB4 Control Theory III

October 19 (Friday) 13:30~15:00, Opal

Chair: Sang Hoon Kang (UNIST, Korea)

FB4-1	<a href="#">Composite Back Stepping Anti-winding Control of Spacecraft with Finite Time Convergence</a> <i>Umair Javaid, Qinglei Hu(Beihang (BUAA) University beijing china, China)</i>	1360
FB4-2	<a href="#">Model Predictive Control with Cross-Product Term between State and Input</a> <i>Sungmin Cho(The University of Tokyo, Japan), Masatsugu Otsuki, Takashi Kubota(Japan Aerospace Exploration Agency, Japan)</i>	1366
FB4-3	<a href="#">Development of a Benchmark Testbed for Input Shaping Control</a> <i>Mahn-Tuan Ha, Rubayet Hassan, Chul-Goo Kang(Konkuk University, Korea)</i>	N/A
FB4-4	<a href="#">Backstepping control integrated with model predictive control for selective catalytic reduction system of diesel vehicle</a>	1376



*Yeonsoo Kim*(Seoul National University, Korea), *Changho Jung*, *Chang Hwan Kim*,  
*Yong Wha Kim*(Hyundai Motor Company, Korea), *Jong Min Lee*(Seoul National  
University, Korea)

#### FB5 Soft sensor and soft actuator

October 19 (Friday) 13:30~15:00, Red Pine

Chair: Sang-Youn Kim (Korea University of Technology and Education, Korea)

- |       |  |     |
|-------|--|-----|
| FB5-1 | <a href="#">Characterization of rectangular shaped perforated Piezoelectric MEMS Directional Microphone inspired by <i>Ormia ochracea</i></a><br><i>Ashiqur Rahaman</i> (Korea University of Technology and Education, Korea), <i>Asif Ishfaq</i> (University of Engineering and Technology, Lahore, Pakistan), <i>Byungki Kim</i> (Korea University of Technology and Education, Korea) | N/A |
| FB5-2 | <a href="#">Design of 2-Dof Dielectric Elastomer Finger Toward an Intimate-Contact Gripper</a><br><i>Geon-Woo Hwang</i> , <i>Ki-Uk Kyung</i> (Korea Advanced Institute of Science and Technology, Korea)   | N/A |
| FB5-3 | <a href="#">Transparent soft micro-actuator array for programmable large force response</a><br><i>Sungryul Yun</i> , <i>Suntak Park</i> (Electronics and Telecommunications Research Institute, Korea), <i>Ki-Uk Kyung</i> (Korea Advanced Institute of Science and Technology, Korea)   | N/A |
| FB5-4 | <a href="#">Application of Thin Film Focus Tunable Lens</a><br><i>Sang-Youn Kim</i> (Korea University of Technology and Education, Korea)  | N/A |

#### FB6 Industrial Applications of Control II

October 19 (Friday) 13:30~15:00, Azalea

Chair: Sukho Park (DGIST, Korea)

- |       |  |      |
|-------|--|------|
| FB6-1 | <a href="#">Design and Experimental Validation of an Output Feedback Controller for a Pneumatic System with Distributed Parameters</a><br><i>Richard Kern</i> (Technical University of Munich, Germany), <i>Nicole Gehring</i> (Johannes Kepler University, Austria), <i>Joachim Deutscher</i> (Friedrich-Alexander University Erlangen-Nürnberg, Germany), <i>Michael Meißner</i> (Technical University of Munich, Germany) | 1391 |
| FB6-2 | <a href="#">A requirement for the number of items in a package produced by multi-head weighers</a><br><i>Yoshiyuki Karuno</i> , <i>Okii Nakahama</i> (Kyoto Institute of Technology, Japan)  | 1397 |
| FB6-3 | <a href="#">Efficiency Analysis of Gear System Based on Gear Surface Micro-topography</a><br><i>Wei Liu</i> (Chongqing University, China)  | 1403 |
| FB6-4 | <a href="#">Efficiency Analysis of Planetary Gear Train under Ring Gear Deformation</a><br><i>Li Xuzhong</i> (Chongqing university, China)   | 1409 |
| FB6-5 | <a href="#">Construction and Efficiency Test of Solar Drying Cabinet for Nipa Palm Drying for Community Enterprise.</a><br><i>Prasit Phoosomma</i> (Dhonburi Rajabhat University, Thailand)  | 1414 |
| FB6-6 | <a href="#">Controlling the Position of the Carriage in Real-Time Using the RBF Neural Network Based PID Controller</a><br><i>Hoang-Dung Nguyen</i> , <i>The Hien Huynh</i> (Can Tho University, Viet Nam)   | 1418 |

## FB7 Guidance, Navigation, and Control

October 19 (Friday) 13:30~15:00, Birch

Chair: Sung-Hoon Mok (Korea Advanced Institute of Science and Technology, Korea)

- |       |  |      |
|-------|--|------|
| FB7-1 | <a href="#">Performance Evaluation of the RTK-GNSS Navigating under Different Landscape</a><br><i>Kok Mun Ng(Universiti Teknologi MARA, Malaysia), Juliana Johari(Universiti Teknologi Mara, Malaysia)</i>   | 1424 |
| FB7-2 | <a href="#">Attitude Dynamics Model-Based Gyroless Attitude Estimation for Agile Spacecraft</a><br><i>Sung-Hoon Mok(Korea Advanced Institute of Science and Technology, Korea), SooYung Byeon(Satrec Initiative, Korea), Hyochoong Bang(Korea Advanced Institute of Science and Technology, Korea)</i> | 1429 |
| FB7-3 | <a href="#">Particle filter with the Novel Resampling Method using Artificial Immune System</a><br><i>Suktae Kang(University of Science and Technology, Korea), Myeong-Jong Yu(University of Science and Technology, Agency for Defense Development, Korea)</i>  | 1435 |
| FB7-4 | <a href="#">RGB-D and Magnetic Sequence-based Graph SLAM with Kidnap Recovery</a><br><i>Hyunjin Kim, Seungwon Song, Jieum Hyun(KAIST, Korea), Soon Hyuk Hong(Samsung Research Samsung Electronics Co., Ltd, Korea), Hyun Myung(KAIST, Korea)</i>   | 1440 |
| FB7-5 | <a href="#">Robust Path Following Controller for Unmanned Aerial Vehicle Based on Carrot Chasing Guidance Law Using Dynamic Inversion</a><br><i>Ehab Safwat Khattab(NWPU, China)</i>   | 1444 |

## FC1 Machine Vision Applications II

October 19 (Friday) 15:20~16:50, Sapphire

Chair: Wang-Heon Lee (Hansei University, Korea)

- |       |  |      |
|-------|--|------|
| FC1-1 | <a href="#">Automatic sphere detection for extrinsic calibration of multiple RGBD cameras</a><br><i>Young Chan Kwon, Jae Won Jang, Ouk Choi(Incheon National University, Korea)</i>                            | 1451 |
| FC1-2 | <a href="#">Extrinsic Calibration of RGB-D Sensor and Robot using Color Chessboard</a><br><i>Kyeong Seock Jang, Jong-Eun Ha(Seoul National University of Science and Technology, Korea)</i>                    | N/A  |
| FC1-3 | <a href="#">Extrinsic Calibration of camera and laser range finder using dummy camera without ir cut filter</a><br><i>Jaeyeul Kim, Jong-Eun Ha(Seoul National University of Science and Technology, Korea)</i> | N/A  |
| FC1-4 | <a href="#">Lane Detection using Deep Learning Semantic Segmentation</a><br><i>Daehun Kim, Jong-Eun Ha(Seoul National University of Science and Technology, Korea)</i>   | N/A  |
| FC1-5 | <a href="#">Localization of Welding Defects using Weakly Supervised Neural Network</a><br><i>Hyeon Joon Choi(University, Korea), Dong-Joong Kang(Pusan National University, Korea)</i>                         | 1461 |

## FC2 Signal and Image Processing II

October 19 (Friday) 15:20~16:50, Crystal

Chair: Hyoungseop Kim (Kyushu Institute of Tecnology, Japan)

FC2-1	<a href="#">Registration of Phalange Region from CR Images Based on Genetic Algorithm</a> <i>Kouhei Kawagoe, Hyoungseop Kim(Kyushu Institute of Tecnology, Japan)</i>	1464
FC2-2	<a href="#">Automatic Extraction of Abnormalities on Temporal CT Subtraction Images Using Sparse Coding and 3D-CNN</a> <i>Yuichiro Koizumi, Hyoungseop Kim(Kyushu Institute of Tecnology, Japan)</i>	1468
FC2-3	<a href="#">Detection of Grasping Position from Video Images Based on SSD</a> <i>Kitayama Taichi, Hyoungseop Kim(Kyushu Institute of Tecnology, Japan)</i>	1472
FC2-4	<a href="#">Wide Residual Networks for Semantic Segmentation</a> <i>Yoshiki Nakayama, Hyoungseop Kim(Kyushu Institute of Tecnology, Japan)</i>	1476

## FC3 Control Applications: Medical Devices, Rehabilitation Robots and Vehicles

October 19 (Friday) 15:20~16:50, Ruby

Chair: Sukho Park (DGIST, Korea)

FC3-1	<a href="#">Electromagnetically Actuated Soft Hydrogel Microrobots for Biomedical Applications</a> <i>Sukho Park(DGIST, Korea)</i>	N/A
FC3-2	<a href="#">Development of 6 DOF Robot High-speed Controller for Pipe coating Automation System</a> <i>Jeongwan Lee(Kangwon National University, Korea)</i>	N/A
FC3-3	<a href="#">Subject-specific Assessment for Upper-limb Reaching Movement Performance of Hemiplegia Patient based on the Nonlinear Model for Individualized Training</a> <i>james Hyungsup Moon, Jongbum Kim, Jonghyun Kim(DGIST, Korea)</i>	N/A
FC3-4	<a href="#">Human limb impedance estimation performance of a widely used robot for human limb studies (HapticMASTER)</a> <i>Sang Hoon Kang, Hyunah Kang, Sung Shin Kim(UNIST, Korea)</i>	N/A
FC3-5	<a href="#">Robot based Shoe Manufacturing System</a> <i>Min-Gyu Kim, Juhyun Kim, Dongbin Shin, Maolin Jin(Korea Institute of Robot and Convergence, Korea)</i>	1491
FC3-6	<a href="#">Robust driving wheel control on soft soil for an off-road vehicle</a> <i>Sera Kim, Gwanyoung Kim, Soo Jin Lee(Myongji University, Korea)</i>	N/A

## FC4 Control Theory IV

October 19 (Friday) 15:20~16:50, Opal

Chair: Soohye Han (POSTECH, Korea)

FC4-1	<a href="#">Robust control of robot manipulators using difference equations as universal approximator</a>	1496
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Payam Kheirkhahan(Garmsar branch, Islamic Azad University, Iran, Islamic Republic of)

FC4-2	<a href="#">Model Predictive Control for Hybrid Electric Vehicles with Linear Parameter-Varying Model</a> <u>Yuta Takahashi</u> , Koichi Hidaka(Tokyo Denki University, Japan)	1501
FC4-3	<a href="#">Disturbance Observer based on Nonlinear Damping velocity control for Permanent Magnet Synchronous Motor (PMSM)</a> <u>Junghwan Gil</u> (Univ. chungang, Korea), Wonhee KIM(Chung-Ang University, Korea)	N/A
FC4-4	<a href="#">Maneuverable Aircraft Flight Control Using Nonlinear Dynamic Inversion</a> <u>Qianlei Jia</u> (NWPU, China)	1513

## FP-B Poster Session

October 19 (Friday) 15:20~16:20, Emerald

Chair: Yeongjin Kim, Jong Heon Kim (Incheon National University, KAIST, Korea)

FP-B-1	<a href="#">A Compact Finger Motion Measurement System without a Calibration Process</a> <i>Yeongyu Park, Joonbum Bae(UNIST, Korea)</i>	N/A
FP-B-2	<a href="#">Extraction of Clinically Relevant Kinematic Parameters from IMU-based Motion Capture System in Upper Extremity of Stroke Patients</a> <i>Hyung Seok Nam, Woo Hyung Lee(Seoul National University College of Medicine, Korea), Matthew W Smuck(Stanford University, United States), Sungwan Kim(Seoul National University College of Medicine, Korea)</i>	N/A
FP-B-3	<a href="#">Design of a seamless active ankle foot orthosis empowered by a custom portable pneumatic pump</a> <i>Sangjoon J. Kim, Handdeut Chang, Haedo Cho, Jung Kim(Korea Advanced Institute of Science and Technology (KAIST), Korea)</i>	1523
FP-B-4	<a href="#">Development of Active Suspension System for the Improvement of Driving Quality in Electric powered wheelchairs</a> <i>Sung Hyun Jang(GERI, Korea)</i>	N/A
FP-B-5	<a href="#">Control Strategy for Shoulder Rehabilitation Robot</a> <i>Jeong-Ho Park, Kyoung-Soub Lee(Korea Advanced Institute of Science and Technology, Korea), Hyung-Soon Park(KAIST, Korea)</i>	N/A
FP-B-6	<a href="#">Observation of Human Trajectory in Response to Haptic Feedback from Mobile Robot</a> <i>Hee-Seung Moon, Woohyun Kim, Seungjae Han, Jiwon Seo(Yonsei University, Korea)</i>	1530
FP-B-7	<a href="#">Preliminary Evaluation of Calibrating Haptic Augmented Virtuality Systems</a> <i>Yoosung Bae, Baekdong Cha, Jeha Ryu(Gwangju Institute of Science and Technology, Korea)</i>	N/A
FP-B-8	<a href="#">Design and Performance Evaluation of Wearable Haptic Interfaces</a> <i>WonHa Lee, Myungsin Kim, Hyojoon Park, Dongjun Lee(Seoul National University, Korea)</i>	N/A
FP-B-9	<a href="#">HOG-based Grasping Type Classification for Automatic Control of Robotic Gripper</a> <i>Yoon Jae Kim, Yeeun Jo(Seoul National University, Korea), Hyung Seok Nam, Sungwan Kim(Seoul National University College of Medicine, Korea)</i>	N/A
FP-B-10	<a href="#">Mapping System with Virtual Reality for Mobile Robot Teleoperation</a> <i>Seungwoon Kim(KAIST, Korea), Yihan Kim, Jeessoo Ha(Korea Advanced Institute of Science and Technology, Korea), Sungho Jo(KAIST, Korea)</i>	1541
FP-B-11	<a href="#">Behavior Analysis of Multi-Agent Game for Human-robot Cooperation</a> <i>Moeko Tominaga(Kyushu Institute of technology, Japan), Yasunori Takemura(NishiNippon Institute of Technology, Japan), Kazuo Ishii(Kyushu Institute of Technology, Japan)</i>	N/A
FP-B-12	<a href="#">Recognition of an Object Pointed at by a Person by using Robot Head Control and Motion Sensor</a> <i>Yuki Matsui, Madoka Oi, Akira Nakamura, Chen Geer, Hideo Furuhashi(Aichi Institute of Technology, Japan)</i>	N/A

FP-B-13	<a href="#">Optimization of cable robot structure with frequency constraints</a> <i>Nguyen Van Sy</i> (Sejong University, Korea), <i>Chang-Hwan Lee</i> (Sejong university, Korea), <i>Hai Nguyen Duc</i> , <i>Ta Duc Hai</i> , <i>Kwan-Woong Gwak</i> (Sejong University, Korea)	N/A
FP-B-14	<a href="#">Iterative algorithm to matrix equation with conjugate and transpose unknown and its application in control</a> <i>Caiqin Song</i> (Shanghai University, China)	1550
FP-B-15	<a href="#">A Study on Applicable Control Methods of Electric Power Steering System in Dynamic Redundancy Environments</a> <i>DaeSung Kim</i> (Sungkyunkwan University, Korea), <i>JinHwan Lee</i> , <i>ManYoung Yang</i> , <i>HongYong Bhae</i> (Mando Corporation, Korea), <i>Jae Wook Jeon</i> (Sungkyunkwan University, Korea)	1556
FP-B-16	<a href="#">UGV Status Monitoring System Using Interacting Multiple Model Filter</a> <i>Chang Mook Kang</i> , <i>Jongho Shin</i> , <i>Taehyung Lee</i> (Agency for Defense Development, Korea)	1562
FP-B-17	<a href="#">Development and verification of oscillation diagnosis algorithm using empirical method for time series data of plant control loop</a> <i>Sungjoo Hwang</i> , <i>Seung-Hyun Byun</i> , <i>Joo-Hee Woo</i> , <i>Wujong Lee</i> (KEPCO Research Institute, Korea)	N/A
FP-B-18	<a href="#">Development of Smart Condition Monitoring and Diagnosis System for Tandem Cold Rolling Mills in Iron and Steel Manufacturing Processes</a> <i>Kee-Young Shin</i> (POSCO Technical Research LABs, Korea)	1568
FP-B-19	<a href="#">Tuning of Notch Filter Parameters Using Deep Reinforcement Learning for Industrial Servo Systems</a> <i>Tae-Ho Oh</i> , <i>Tae-Il Kim</i> , <i>Ji-Seok Han</i> , <i>Young-Seok Kim</i> (Seoul National University, Korea), <i>Ji-Hyung Lee</i> , <i>Sang-Oh Kim</i> , <i>Sang-Sub Lee</i> , <i>Sang-Hoon Lee</i> (RS Automation, Korea), <i>Dong-Il Dan Cho</i> (Seoul National University, Korea)	N/A
FP-B-20	<a href="#">Resonance Suppression Using Bi-quad Lag Compensator for Industrial Servo System with High Inertia Ratio and Resonance Frequency Variations</a> <i>Young-Seok Kim</i> , <i>Tae-Il Kim</i> , <i>Ji-Seok Han</i> , <i>Tae-Ho Oh</i> (Seoul National University, Korea), <i>Ji-Hyung Lee</i> , <i>Sang-Oh Kim</i> , <i>Sang-Sub Lee</i> , <i>Sang-Hoon Lee</i> (RS Automation, Korea), <i>Dong-Il Dan Cho</i> (Seoul National University, Korea)	1578
FP-B-21	<a href="#">Study on Wireless Power Transfer for Drilling Tools</a> <i>Jingyi Yang</i> , <i>Yuelong Wang</i> , <i>Yi Gao</i> (Xi'an Shiyong University, China)	1584
FP-B-22	<a href="#">On the effect of ship navigation on environmental circulation and countermeasures</a> <i>Noriko Nishii</i> , <i>Naohiro Yamatani</i> , <i>Toshihiko Nakatani</i> (National Institute of Technology, Toyama College, Japan)	N/A
FP-B-23	<a href="#">Characteristics of Split of Principal States of Polarization Considering Photocurrent Noises for Polarization Mode Dispersion Compensation in Optical Fiber Network</a> <i>Ki Ho Han</i> (Kongju National University, Korea)	N/A
FP-B-24	<a href="#">Effect of Polarization Dependent Loss on Degree of Polarization of Polarization Mode Dispersion Compensator for Fiber-Optic Communication</a> <i>Ki Ho Han</i> (Kongju National University, Korea)	N/A
FP-B-25	<a href="#">Development of the Image to Spike Conversion Algorithm for the Deep Neural Networks</a> <i>Kyukwang Kim</i> , <i>Jinki Kim</i> , <i>Seunghye Lee</i> , <i>Yeeun Kim</i> , <i>Hyun Myung</i> (KAIST, Korea)	N/A
FP-B-26	<a href="#">Analysis of Scheduling Strategies for Spacecraft On-Board Control Procedure: Lua Coroutine vs. VxWorks Task</a> <i>Su Hyun Park</i> , <i>Jong Wook Choi</i> (Korea Aerospace Research Institute, Korea)	1598

FP-B-27	<a href="#">SpaceWire performance analysis for a next generation processors</a> <i>Bum-Soo Yoo, Jae-Yeop Jeong, Sun-Wook Kim, Jong Wook Choi(Korea Aerospace Research Institute, Korea)</i>	N/A
FP-B-28	<a href="#">Exception and Interrupt Handling of Flight Software with VxWorks RTOS for PCI-based LEO On-Board Computer</a> <i>Jong Wook Choi, Jae-Yeop Jeong, Bum-Soo Yoo, Sun-Wook Kim(Korea Aerospace Research Institute, Korea)</i>	1607
FP-B-29	<a href="#">Fast Inter Mode Decision using Early Skip Decision and Simplified Motion Estimation for Lightweight HEVC Encoder</a> <i>Sungjei Kim(Korea Electronics Technology Institute, Korea)</i>	N/A
FP-B-30	<a href="#">A Study on the Position and Posture Estimation of Objects Using Deep Learning</a> <i>Kyung-Jae Jang, Hyuk Han(SEOUL NATIONAL UNIVERSITY OF SCIENCE AND TECHNOLOGY, Korea), Jong Hyeong Kim(Seoul Tech., Korea)</i>	N/A
FP-B-31	<a href="#">Accuracy Evaluation of Registration of 3D Normal Distributions Transforms Interpolated by Overlapped Regular Cells</a> <i>Hyunki Hong, Hanjun Kim, Beomhee Lee(Seoul National University, Korea)</i>	1616
FP-B-32	<a href="#">Improved Iterative Closest Point Algorithm using Truncated Signed Distance Function</a> <i>Hanjun Kim, Hyunki Hong, Beomhee Lee(Seoul National University, Korea)</i>	1620
FP-B-33	<a href="#">Moving Object Detection using Motion Segmentation and Geometric Constraints</a> <i>Jungho Kim(Korea Electronics Technology Institute, Korea)</i>	N/A
FP-B-34	<a href="#">Relationship Sugar Content of Ripe Tomatoes and Intensity on Infrared Image</a> <i>Takuya Fujinaga, Kazuo Ishii(Kyushu Institute of Technology, Japan)</i>	N/A
FP-B-35	<a href="#">Machine Vision Based Weight Prediction for Flatfish</a> <i>Kang Hyun Hwang, Jae Weon Choi(Pusan National University, Korea)</i>	1628
FP-B-36	<a href="#">Preliminary Study on Context-aware Winter Sports based on the Deep Neural Networks</a> <i>Seung-Chan Kim(Hallym Univ., Korea), Byung-Kil Han(KAIST, Korea), Je-Kwang Ryu(Seoul National University, Korea)</i>	N/A
FP-B-37	<a href="#">Video Based License Plate Recognition of Moving Vehicles Using Convolutional Neural Network</a> <i>Sanghyeop Lee(Kyungsung University,, Korea), Keum-Young Son, Byung-Woo Yoon, Jang Sik Park(Kyungsung University, Korea)</i>	1634
FP-B-38	<a href="#">A Consideration of “Expression in Mechanics Sense”: Concept and Case Study for Conceptual Design</a> <i>Toshio HIRA(National Institute of Technology, Nara College, Japan)</i>	1637
FP-B-39	<a href="#">Comparative Analysis of Face Detection Algorithms: Novice to Novel</a> <i>Ahmad S Almadhor(Aljouf University and University of Denver, United States)</i>	1642
FP-B-40	<a href="#">Application of Machine Learning to Stability Evaluation of Power Grids with Changeable Renewable-Energy Supply</a> <i>So Sasaki, Tomohide Wakae, Kota Yaguchi, Toshiya Takano(Toshiba Corporation, Japan)</i>	N/A
FP-B-41	<a href="#">Machine Learning-based Prediction of Post-stroke Swallowing Impairment</a> <i>Woo Hyung Lee, Min Hyuk Lim, Hyung Seok Nam(Seoul National University College of Medicine, Korea), Byung-Mo Oh(Seoul National University Hospital, Korea), Sungwan Kim(Seoul National University College of Medicine, Korea)</i>	N/A
FP-B-42	<a href="#">Deep learning model of multiple signal detection for molecular communication based biomimetic robots</a>	N/A



*Byunghnam Im*(Seoul National University, Korea), *Minchul Kim*(SNU, Korea), *Jungwoo Lee*(Seoul National University, Korea)

FP-B-43 [Vibration Control of Vehicle Active Suspension System Using DDPG Algorithm](#) 1654  
*Seong-Jae Kim, Dong-Joong Kang, Hyun-Soo Kim*(Pusan National University, Korea)

FP-B-44 [Driver Acceleration/Deceleration Demand Prediction Based on Extreme Learning Machine](#) N/A  
*Fuguo Xu*(Sophia University, Japan), *Jiangyan Zhang*(Dalian Minzu University, China), *Yahui Zhang, Tielong Shen*(Sophia University, Japan)

### FP-C Poster Session

October 19 (Friday) 16:20~17:20, Emerald

Chair: Seung-Chan Kim, Youngjin Na (Hallym University, Sookmyung Women's University, Korea)

- FP-C-1 [Development of an Operational Reliability Test-bed by using CompactDAQ for NSSS Integrity Monitoring System](#) N/A  
*Yongsik Kim*(the Central Research Institute of KHNP, Korea), *Ho-Sun Ryu, Min-Seok Kim*(KHNP Central Research Institute, Korea), *Dongill Lee*(the Central Research Institute of KHNP, Korea), *Kwang Dae Lee*(Central Research Institute, KHNP, Korea)
- FP-C-2 [Analytical Approach for Optimal Filter Design of Internal Model Control](#) N/A  
*Muhammad Zahoor*(Yeungnam University, Korea), *Rodrigue Tchamna*(The City College of New York, United States), *Moonyong Lee*(yeungnam university, Korea)
- FP-C-3 [Comparative Study of Modeling Sesame Oil Extraction Process By Using Hexane](#) 1663  
*Haitham Osman*(King Khalid University, Saudi Arabia)
- FP-C-4 [Proposal of Gripper and Gripping Method for Mating Process of Electric Connectors](#) N/A  
*Junhyung Heo, Soonwoong Hwang, Hyeonguk Kim, Inhyuk Baek, Boyoung An, KyooSik Shin, Changsoo Han*(Hanyang University, Korea)
- FP-C-5 [Design and Control of Under-Actuated Tendon-Driven Robotic Finger: Experimental Results](#) N/A  
*Junyoung Park, Minji Kim, Dongjun Lee*(Seoul National University, Korea)
- FP-C-6 [Guide-rail and robotic manipulator system for unmanned factories](#) N/A  
*Hongseob Kim, Sijun Ryu, Sewoong Yim, Minseok Jeon, Jaehoon Jeong, Donghyun Lee*(Yeungnam Univ., Korea), *TaeWon Seo*(Hanyang Univ., Korea)
- FP-C-7 [A donut-shape modular robot](#) N/A  
*TaeWon Seo*(Hanyang Univ., Korea), *Hyungsoo Choi, Jihwan Oh, Sunghan Byun, Dongwook Ha*(Yeungnam Univ., Korea)
- FP-C-8 [Extrinsic Calibration of Robotic Laser Scanning System using Spherical Target](#) N/A  
*Sungmoon Joo, Dongjun Hyun, Ikjune Kim, Jonghwan Lee*(Korea Atomic Energy Research Institute, Korea)
- FP-C-9 [Optimal Outer-Loop Position Controller for Two-Wheeled Mobile Balancing Robot Based-on Off-Line Optimization Technique](#) 1675  
*Eui Sin Yim, Sung Eun Lee, Young Seok Lee, Seok-Kyoon Kim*(Hanbat National University, Korea)
- FP-C-10 [Combined Stiffness Identification of 6-DoF Industrial Robot](#) 1681  
*Kai Egil Berntsen, Andre Bleie Bertheussen, Ilya Tyapin*(University of Agder, Norway)



FP-C-11	<a href="#">External Wrench Estimation in Grasping Task of Under-actuated Multi-fingered Gripper using Tactile Sensor</a> <i>Yunjoo Kim, Jung Kim(KAIST, Korea)</i>	N/A
FP-C-12	<a href="#">Design of cable robot for 3D printing for construction</a> <i>Chang-Hwan Lee, Chi Hong Park, Ta Duc Hai(Sejong university, Korea), Kwan-Woong Gwak(Sejong University, Korea)</i>	N/A
FP-C-13	<a href="#">Workspace determination model of cable robot for 3D printing building construction using optimal tension distribution analysis</a> <i>Chi Hong Park, Chang-Hwan Lee(Sejong university, Korea), Kwan-Woong Gwak(Sejong University, Korea)</i>	N/A
FP-C-14	<a href="#">PD Control for Swing-up Motion of 2-link Underactuated Robot with Spring</a> <i>Inhyuk Baek, Hyeonuk Kim, Soonwoong Hwang, Boyoung An, Junhyung Heo, Yongho Ju, Kyoosik Shin(Hanyang University, Korea)</i>	N/A
FP-C-15	<a href="#">EMG Compliance Controller Compensating Steady-State Error from External Forces</a> <i>Jaewoo Kim(University of Science and Technology/Korea Institute of Industrial Technology, Korea), Gi-Hun Yang(Korea Institute of Industrial Technology, Korea)</i>	N/A
FP-C-16	<a href="#">Long Arm Manipulator Path Interpolation Using 4th Order B-Splines</a> <i>Ilya Tyapin, Geir Hovland(University of Agder, Norway)</i>	1698
FP-C-17	<a href="#">Data-based Assembly Failure State Estimation of mobile IT parts using a 6 DOF manipulator</a> <i>Minwoo Na, Tae-Jung Kim, Jae-Bok Song(Korea University, Korea)</i>	1703
FP-C-18	<a href="#">Development of Virtual Reality-Vision System in Robot-Assisted Laparoscopic Surgery</a> <i>Yeeun Jo, Yoon Jae Kim, Hye-Min Moon, Sungwan Kim(Seoul National University, Korea)</i>	1708
FP-C-19	<a href="#">Developing a Robotic Spasticity Simulator with a Robust Control Strategy to Mimic Various Joints</a> <i>Igor Ferreira Pinto, Seunghee Lee, Joohwan Sung, Jonghyun Kim(DGIST, Korea)</i>	N/A
FP-C-20	<a href="#">Development of Vision System's Control by Novel Master Interface in Laparoscopic Robot-Assisted Surgery</a> <i>Hye-Min Moon, Yeeun Jo, Sungwan Kim(Seoul National University, Korea)</i>	N/A
FP-C-21	<a href="#">Development of Split-belt Treadmill for Lower Limb Rehabilitation</a> <i>Hyun Ju Lee, Dae Han Hong(DGIST, Korea), Tae Hun Kang(Daegu Gyeongbuk Institute of Science &amp; Technology, Korea)</i>	N/A
FP-C-22	<a href="#">Optimal design of a quadruped walking robot's leg</a> <i>Jongrib Ha(kyungpook national university, Korea)</i>	1723
FP-C-23	<a href="#">Human-machine Interface for Acquiring of Human Balancing Data and Providing of Balance Feedback Using Cable-driven Mechanism</a> <i>Hyungwoo Kim, Jaehwan Bong, Suhun Jung, Shinsuk Park(Korea University, Korea)</i>	N/A
FP-C-24	<a href="#">Lateral Push Recovery Control by Stepping for Humanoid Robot</a> <i>Donghyeon Seo, Harin Kim(Kyunghee university, Korea), Donghan Kim(Kyung Hee University, Korea)</i>	N/A
FP-C-25	<a href="#">Personal Mobility Vehicle User's Psychological Reaction to Surrounding People</a> <i>Yoshihiko Takahashi, Shoya Shirai(Kanagawa Institute of Technology, Japan)</i>	1730
FP-C-26	<a href="#">Variable formation control of multiple robots via Virtual Robot Center</a> <i>Sung-Gil Wee(DGIST(Daegu Gyeongbuk Institute of Science &amp; Technology), Korea),</i>	N/A

	<i>Tae Hun Kang(Daegu Gyeongbuk Institute of Science &amp; Technology, Korea), Dae Han Hong(DGIST(Daegu Gyeongbuk Institute of Science &amp; Technology), Korea)</i>	
FP-C-27	<a href="#">Image-projection system in a guide robot</a> <i>Madoka Oi, Yuki Matsui, Masashi Ukai, Chen Geer, Hideo Furuhashi(Aichi Institute of Technology, Japan)</i>	N/A
FP-C-28	<a href="#">Current Control of Sawyer Motors with Microstepping Method Using Proximated In-phase Current Estimator</a> <i>Hongkyu Kim, Yoonmo Sung, Chung Choo Chung(Hanyang University, Korea)</i>	1740
FP-C-29	<a href="#">Development of Multiple-disk Type MR Fluid Brake with Three Modules for Wearable Robots Driving Part</a> <i>Hyeong-Rae Kim, Ihn-Sik Weon, Soon-Geul Lee, Myung-Jin Choi(KyungHee University, Korea), Jae-Kwan Ryu(LIG Nex1, Korea)</i>	1746
FP-C-30	<a href="#">Distance Estimation Methods in Vehicular Application: An Experimental Study</a> <i>Yiwen Cao, Zhonghua Zhao(Shanghai Jiaotong University, China)</i>	1752
FP-C-31	<a href="#">Numerical and Experimental Investigation on Injection Molding of Micro-Pillars</a> <i>Sung Jea Park(Korea University of Technology and Education, Korea)</i>	N/A
FP-C-32	<a href="#">An Approach for Reducing Computational Time for Real-Time Autonomous Vehicle Tracking</a> <i>TaeWook Hwang(ChungNamNationalUniversity, Korea)</i>	1760
FP-C-33	<a href="#">Fabrication Method and Characterization of a Wireless Strain Sensor</a> <i>Kyeong Jae Lee, Sohee Kim(DGIST, Korea)</i>	N/A
FP-C-34	<a href="#">Fabrication of Silicon Nanowire by Top-down method and Transferring it into an Elastomeric Substrate</a> <i>Minwon Seo, Jong-Mo Seo, Dong-Il Dan Cho(Seoul National University, Korea), Kyo-in Koo(University of Ulsan, Korea), Seohyeong Jang(Seoul National University, Korea)</i>	N/A
FP-C-35	<a href="#">The Novel Detection and Segmentation Image Processing Algorithm for Endoscopic Surgery System</a> <i>Chan-Il Kim(Keimyung University, Korea), Su Han Lee, MinJi Choi(Gumi Electronics and Information Technology Research Institute, Korea), Hyung Jin Kim(Electronics and Information Technology Research Ins, Korea), Jong-Ha Lee(Keimyung University, Korea)</i>	N/A
FP-C-36	<a href="#">Preliminary Study on Camera-Laser Calibration for Underwater Laser Scanning</a> <i>Yeongjun Lee(Korea Research Institute of Ships &amp; Ocean engineering, Korea), Hyun-Taek Choi(Korea Research Institute of Ships and Ocean Engineering, Korea), Tae-Kyeong Yeu(KRISO, Korea)</i>	N/A
FP-C-37	<a href="#">Development of the sensorized hybrid gripper for the proprioceptive grasping</a> <i>Wookeun Park, Seongmin Seo, Joonbum Bae(UNIST, Korea)</i>	N/A
FP-C-38	<a href="#">Motion Recognition System for Worker Safety in Manufacturing Work Cells</a> <i>Sangseung Kang(ETRI, Korea)</i>	1774
FP-C-39	<a href="#">Towards Automated 3D reconstruction in SME factories and Digital Twin Model generation</a> <i>Alex Alcocer, Ole Henrik Haakstad, Olav Sakseid, Mathias Stensrud, Baard Westby(OsloMet, Norway)</i>	1777
FP-C-40	<a href="#">Large Scale Representation of Volumetric Fusion using ICP</a> <i>Hae Min Cho, HyungGi Jo, Seongwon Lee(Yonsei University, Korea), Euntai Kim(Yonsei Univ., Korea)</i>	N/A

FP-C-41	Development of Foot Devices for Virtual Reality <u>Junghoon Park</u> , <u>Jung Kim</u> (KAIST, Korea)	1784
FP-C-42	Positioning Accuracy Assement of SBAS in Korea using MSAS System <u>Jun O Kim</u> (Agency for Defense Development, Korea), <u>Sang Jeong Lee</u> (Chungnam National University, Korea)	N/A
FP-C-43	Problems in Models of Opening Networks Resources and Methods for Calculating System Performance and Reliability <u>Gulnara Bektemyssova</u> (International Information Technologies University, Kazakhstan)	1790
FP-C-44	A Novel Robust Disturbance Observer for Uninterruptible Power Supplies <u>Yahya Danayiyen</u> (Karadeniz Technical University, Turkey), <u>Young Il Lee</u> (SeoulTech, Korea)	N/A
FP-C-45	A Study on Intelligent Control of Humanoid Type Robot with Two-Wheel Driving Based on Continuous Voice Recognition for Smart FA <u>Sung Hyun Han</u> (Kyungnam University, Korea)	N/A
FP-C-46	A Study on Iterative Learning Control of Mobile Robot with Two Arms for Handling and Arraying of Objects in High Temperature Environments <u>Sung Hyun Han</u> (Kyungnam University, Korea)	N/A
FP-C-47	A Study on Immitation Motion Learning Control of Humanoid Robot for Grasping and Pouring into a Cup with Two Hands <u>Sung Hyun Han</u> (Kyungnam University, Korea)	N/A
FP-C-48	A Study on Robust Control of Mobile-Manipulator Robot based on Iterative Learning for Cooperative Working <u>Sung Hyun Han</u> (Kyungnam University, Korea)	N/A
FP-C-49	A Study on Design and Control of Flexible Robot Hand for Grasping and Arraying of Objects <u>Sung Hyun Han</u> (Kyungnam University, Korea)	N/A