

Contents

Plenary Talks

- > **Plenary Talk I**
Symbolic AI + Embodied AI = Dependable Robot Intelligence?
Il Hong Suh(Hanyang University), [Korea](#) 3

- > **Plenary Talk II**
Visual SLAM in large environments
Juan D. Tardos(Centro Politecnico Superior Universidad de zaragoza), [Spain](#) 4

- > **Plenary Talk III**
Maximal Information Systems
Alexei Makarenko(The University of Sydney), [Australia](#) 5

- > **Plenary Talk IV**
Telehaptics - Principle, Design and Implementation
K. Ohnishi(Keio University), [Japan](#) 6

- > **Plenary Talk V**
Mobiligence: Emergence of Adaptive Motor Function through Interaction among the Body,
Brain and Environment
Hajime Asama(University of Tokyo), [Japan](#) 7

- > **Plenary Talk VI**
Force and Visual Control for Physical Human-Robot Interaction
Bruno SICILIANO (Università di Napoli Federico II), [Italy](#) 9



TS1: Dependable manipulation

Session Chair : SungChul Kang

Korea Institute of Science and Technology, Korea

- TS1-1** Design of a Humanoids Specific Anthropomorphic Robot Hand by Imitating Human Finger's Motion **(KRS051)**
Sang-ik An(Korea Aerospace University), Yonghwan Oh(KIST) and
SangJoo Kwon(Korea Aerospace University), **Korea** **13**
- TS1-2** Robot Skill Learning Strategy for Contact Task **(KRS062)**
Byungchan Kim, Byungduk Kang, Shinsuk Park(Korea University) and
Sungchul Kang(KIST), **Korea** **20**
- TS1-3** Design of the Safe and Speedy Robot Arm with Variable Stiffness Joint **(KRS130)**
Junho Choi, Woosub Lee, Mankyung Kim and
Sungchul Kang(Korea Institute of Science and Technology), **Korea** **26**

TS2: Mobile Robot & Application

Session Chair : Jee-Hwan Ryu

Korea University of Technology and Education, Korea

- TS2-1** A User Study of a Mobile Robot Teleoperation **(KRS001)**
Ildar Farkhatdino and Jee-Hwan Ry(Korea University of Technology and Education), **Korea** **35**
- TS2-2** An approach for Modularization Design of Mobile Robot **(KRS010)**
Yunxia Wang, Xiaodong Zhang and Dejun Li(Xi'an Jiaotong University), **China** **41**
- TS2-3** Controller design of the propulsion system used in the autonomous vehicle **(KRS032)**
Haiquan Wang, Yingqing Guo and
Xiaodong Zhang(Northwestern Polytechnical Univ.), **China** **46**
- TS2-4** Inspection of Insulators on High Voltage Power Transmission Line **(KRS118)**
SunSin Han, DeukKwon Kim and JangMyung Lee(Pusan National University), **Korea** **51**

TS3: Trends in the North American Personal, Service and Mobile Robotics Market

Session Chair : Sooyong Lee
Hongik University, Korea

- TS3-1** Trends in the North American Personal, Service and Mobile Robotics Market
Dan Kara(Robotics Trends), USA 59

TS4: Humanoid & Application

Session Chair : Joono Cheong
Korea University, Korea

- TS4-1** Adaptive Communication Selection for Multi-Robot Interaction (KRS042)
Kyunghwa Park, Hyoungnyoun Kim, Hyunglae Lee and
Ji-Hyung Park(Korea Institute of Science and Technology), Korea 63
- TS4-2** Structural Optimization of the Pelvis in a Humanoid Considering Dynamic Characteristics (KRS044)
I. K. Lee, E. P. Hong(Hanyang University), B. J. You, C. H. Kim(KIST) and
G.J. Park(Hanyang University), Korea 69
- TS4-3** Grasp Planning for Three-Fingered Robot Hands using Taxonomy-Based Preformed Grasps and Object Primitives (KRS054)
Hyunhwan Jeong, Jongwoo Park, Joono Cheong(Korea University) and
Frank Chongwoo Park(Seoul National University), Korea 75
- TS4-4** Inertial Sensor Alignment with Human Arm Orientation for Humanoid User Interface (KRS120)
Chulwoo Kang, Young Min Yoo and Chan Gook Park(Seoul National University), Korea 81

TS5: Ambient Intelligence

Session Co-Chairs : Seungmoon Choi / Kai Wei Ong
POSTECH, Korea / Nanyang Technological University, Singapore

- TS5-1** A Handheld Interface for mixed Multi-Agent Interaction (KRS015)
Kai Wei Ong, Siang Kok Sim, Gerald Seet, Boon Keat Goh and
Van An Huynh(Nanyang Technological University), Singapore 89
- TS5-2** ARPEES: Adaptive Routing Protocol with Energy-Efficiency and Event-Clustering for Wireless Sensor Networks (KRS028)
Vinh Tran Quang and Takumi MIYOSHI(Shibaura Institute of Technology), Japan 95

TS5-3	Unified S/W Platform for Ubiquitous Robot, AnyRobot Studio (KRS040) Kwang-Choon Kim, Hyun-Sik Shim, Kang-Hee Lee, and Jong-Chang Lee(Samsung Electronics Co.), Korea	101
TS5-4	Mobile Haptic Interface for Large Immersive Virtual Environments: PoMHI v0.5 (KRS046) Chaehyun Lee, Min Sik Hong, In Lee, Oh Kyu Choi, Kyung-Lyong Han, Yoo Yeon Kim, Seungmoon Choi and Jin S. Lee(POSTECH), Korea	106
TS5-5	Modeling of Indoor Space and Environment Sensor (KRS053) Kyeong-Won Jeon, Jeongseok Ki and Yong-Moo Kwon(Korea Institute of Science & Technology), Korea	112
TS5-6	Context Aware Service Agents for Ubiquitous RobotsApplications (KRS081) Abdelghani Chibani(Citypassenger), Karim Djouani and Yacine Amirat(Paris 12 University), France	118

TS6: Navigation & Localization

Session Chair : Nakju Lett Doh
Korea University, Korea

TS6-1	Sonar Feature Detection and Application to EKF Localization (KRS002) Se-Jin Lee and Dong-Woo Cho(POSTECH) and Jong-Hwan Lim(Cheju National University), Korea	127
TS6-2	A Simultaneous Localization And Mapping Algorithm for Topological Maps with Dynamics (KRS007) Nakju Lett Doh(Korea University), Kyungmin Lee and Wan Kyun Chung(POSTECH), Korea	133
TS6-3	Square Root Iterated Kalman Filter for Bearing-Only SLAM (KRS041) Hyungpil Moon, George Kantor, Howie Choset and StephenTully(Carnegie Mellon University), USA	140
TS6-4	Artificial Landmark Design and Recognition for Localization (KRS105) Si-Yong Kim, Sooyong Lee(Hongik University) and Jae-Bok Song(Korea University), Korea	148
TS6-5	Range Sensor Scan Matching for Localization and Map Building (KRS106) Seong Ho Cho, Sooyong Lee(Hongik University) and Wonpil Yu(ETRI), Korea	154

TS7: Swarm & Robotics

Session Chair : Hyungpil Moon
Carnegie Mellon University, USA

- TS7-1** Neighbor-Referenced Formation Control for a Team of Mobile Robots **(KRS035)**
Geunho Lee and
Nak Young Chong(Japan Advanced Institute of Science and Technology), **Japan** **163**
- TS7-2** Kalman Filter based ZMP Estimation Scheme for Balance Control of a Biped Robot **(KRS052)**
Sangbum Park, Youngjoon Han and Hernsoo Hahn(Soongsil University), **Korea** **169**
- TS7-3** Predicting the Size of Spring Network Swarm in Quadratic Potential Fields **(KRS112)**
Hyungpil Moon, Howie Choset(Carnegie Mellon University) and
Jonathan E. Luntz(The University of Michigan), **USA** **174**

TS8: Autonomous Vehicle

Session Chair : Tsutomu Hasegawa
Kyushu University, Japan

- TS8-1** Fault Diagnosis of Aircraft Engine Sensor Based on Sequential Probability Ratio Test and Kalman filter **(KRS019)**
Ying-qing Guo and Wei Xue(Northwestern Polytechnical University), **China** **181**
- TS8-2** A Shared Fate Approach to Improve UAV Pilot Performance and Minimize Accidents **(KRS077)**
James Hing and Paul Y. Oh(Drexel University), **USA** **186**
- TS8-3** Unmanned Aerial Vehicle Rotorcraft: Identifying Landing Zones in the Presence of Obscurants **(KRS078)**
Keith Sevcik, Noah Kuntz and Paul Oh(Drexel University), **USA** **194**
- TS8-4** Backward Parking Control of a Car with Passive Trailers **(KRS125)**
Seung-bohm Hong and Woojin Chung(Korea University), **Korea** **201**

TS9: Bio-mimetic Mechanism

Session Chair : Tatsuo Arai
Osaka University, Japan

- TS9-1** A Development of Wall-Climbing Robot with Pneumatic System **(KRS018)**
Panich Surachai, **Iran** **209**

- TS9-2** Determination of Joint Angles for Fitting a Serpentine Robot to a Helical Backbone Curve
(KRS085)
Goldman, Gabriel J. and Dennis Hong(Virginia Tech.), USA 215
- TS9-3** An Insect-Like Flapping-wing Device Actuated by a Compressed Unimorph Piezoelectric
Composite (KRS113)
Quoc Viet Nguyen, Hoon Cheol Park and Nam Seo Goo(Konkuk University), Korea 221
- TS9-4** An Undulatory Locomotion Controller for Snake-like Robots Based on Adaptive Central
Pattern Generators (KRS034)
Jae-Kwan Ryu and
Nak Young Chong(Japan Advanced Institute of Scienceand Technology), Japan 227

TS10: Sensor & Actuator

Session Chair : Lichen Gu
Xi'an University, China

- TS10-1** Robot Microphone Testing Criteria for Distant-Talking Robot Applications (KRS022)
Hyunsoo Kim(Samsung Electronics), Jounghoon Beh(Korea University),
Sungju Ahn, Younghee Park, Hyunsik Shim and Jongchang Lee(Samsung Electronics) and
Hanseok Ko(Korea University), Korea 235
- TS10-2** A New Adjustable Actuator for Vehicle Engine (KRS095)
Yutao Yang and Xiaodong Zhang(Northwestern Ploytechnical University), USA 239
- TS10-3** Fusion Method for Multi-sensor Dynamic Data (KRS096)
Lichen Gu(Xi'an University), China 244
- TS10-4** Personal Information Extraction Using A Microphone Array (KRS119)
Hye-Jin Kim, Kyung Sook Bae and
Ho-Sub Yoon(Electronics and Telecommunications Research Institute), Korea 250

TS11: Vision & Application

Session Chair : Jae-Bok Song
Korea University, Korea

- TS11-1** Recognition of Moving Objects in Mobile Robot with an Omnidirectional Camera (KRS005)
Jong-Cheol Kim, Kui-Hong Park, Young-Myoung Kim(KT), Korea and
Yasuo Suga(Keio University), Japan 257
- TS11-2** Recognition of Objects with Legs Using Vision-based Candidate Generation and
Evaluation (KRS020)

Tae-Bum Kwon and Jae-Bok Song(Korea University), [Korea](#) 264

TS11-3 Recognition of Human action in Dynamic image using Entropy measurement based on Frequency of Motion region [\(KRS069\)](#)

Miwa Takai(Tokyo Institute of Technology), [Japan](#) 270

TS12: Bio-Signal Processing

Session Chair : Xiaodong Zhang

Xi'an Jiaotong University, China

TS12-1 Traffic Sign Recognition for Intelligent Vehicle/Driver Assistance System Using Neural Network on OpenCV [\(KRS036\)](#)

Auranuch Lorsakul and Jackrit Suthakorn(Mahidol University), [Thailand](#) 279

TS12-2 Design a Reject Output for Pattern Recognition Neural Network by Using a Dynamic Radial Basis Function Network [\(KRS066\)](#)

Le Dung and Makoto Mizukawa(Shibaura Institute of Technology), [Japan](#) 285

TS12-3 Improvement of Real-Time Object Tracking Performance of The ROBOKER Head by RBF Network Compensation [\(KRS086\)](#)

Dong Min Kim, Geun Hyung Lee and Seul Jung(Chungnam National University), [Korea](#) 291

TS12-4 Pattern Recognition of Typical Grasping Operations Using a Wavelet Feature of EEG Signal [\(KRS097\)](#)

Xiaodong Zhang, Weifeng Diao(Xi'an Jiaotong University), [China](#) and

Hyoukryeol Choi(Sungkyunkwan University), [Korea](#) 296

TS13: Design and Synthesis of Mechanical System

Session Chair : Jonghoon Park

PIRO, Korea

TS13-1 Visualization of Cornea Dynamics [\(KRS082\)](#)

Naoyuki Yamasaki, Makoto Kaneko and Mitsuru Higashimori(Osaka University) and

Yoshiaki Kiuchi(Hiroshima University), [Japan](#) 305

TS13-2 Scenario Analysis of Sustainability in Global Resource Circulation [\(KRS083\)](#)

Yusuke Kishita, Shinichi Fukushige, Yasushi Umeda(Osaka University) and

Jun Fujimoto(The University of Tokyo), [Japan](#) 311

TS13-3 Preliminary Study on Flexible Product Family Deployment by Optimal Anticipatory Design of Common Components [\(KRS087\)](#)

Ryota AKAI and Kikuo Fujita(Osaka University), [Japan](#) 317

TS13-4 Development of Quasi-3D-Rehabilitation-System, “Hybrid PLEMO” **(KRS111)**

Ying JIN, Makoto HARGUCHI, Kazuki FUKUSHIMA, Takehito KIKUCHI and

Junji FURUSHO(Osaka University), [Japan](#) 323

TS14: Industry Session I

Session Chair : Jinho Suh

PIRO, Korea

TS14-1 Advanced CMOS Image Sensor for Robot Eye **(KRS048)**

Jeong-Ho Lyu, Jae Heon Choi, Sung Wook Mo(Maru LSI Co. Ltd.), Seok Choi, Jung Hyun Nam and

Jin Bok Jung(Miru Data System Co. Ltd.), [Korea](#) 329

TS14-2 The Development Concepts and Business Model for Intelligent Service Robot **(KRS071)**

H. K. LEE and K. C. SHIN(Yujin Robot), [Korea](#) 331

TS14-3 Development of the Humanoid Research Platform, URIA (Ubiquitous Robotics Information Assistant) **(KRS128)**

Jea-Kweon Han, In-Young Ha and Byoung-Soo Kim(ROBOTIS Co.), [Korea](#) 333

TS15: Industry Session II

Session Chair : Jinhyun Kim

Seoul National University of Technology, Korea

TS15-1 Development of Ultrasonic Sensors with One-Side-Asymmetric Beam Directivity for Mobile Robots **(KRS074)**

Byung-Geuk Kim, Youn-Kuk Ahn, Duck-Hee Choi, Young-Hyun Nam and

Jin Ho Cheong(Hagisonic Co., Ltd.), [Korea](#) 337

TS15-2 Improvement of iGS Positioning Sensor for Ubiquitous Robot Companion **(KRS109)**

Jin, Jo Cheol and Lee, In Ock(Ninety System Co., Ltd.), [Korea](#) 341

TS15-3 EDS-EDRS (Exciting & Dynamic Robot control Simulation software) **(KRS129)**

Lee Hyo Young(ED Co., Ltd.), [Korea](#) 347

TS16: Towards New Trends of Robotics

Session Chair : Makoto Kaneko
Osaka University, Korea

- TS16-1** Collaborative Monitoring Using UFAM and Robot-2ndreport : Development of integrated management system- **(KRS076)**
Takahiro Miyauchi, Tomohito Takubo, Yasushi Mae, Tatsuo Arai(Osaka University) and Kenichi Ohara(AIST), [Japan](#) **351**
- TS16-2** Architecture of Navigation System Using CBD Method and UPnP Middleware **(KRS098)**
Joong-Tae Park, Jae-Bok Song(Korea University) and Sangseok Yun(Korea Institute of Science and Technology), [Korea](#) **357**
- TS16-3** Basic Consideration on Robotic Food Handling by Using Burger Model **(KRS099)**
Naoki Sakamoto(Mayekawa Mfg. Co., Ltd.), Mitsuru Higashimori(Osaka Univ.), Toshio Tsuji(Hiroshima Univ.) and Makoto Kaneko(Osaka Univ.), [Japan](#) **363**
- TS16-4** Robot Town Project: Sensory Data Management and Interaction with Robot of Intelligent Environment for Daily Life **(KRS102)**
Tutomu Hasegawa, Kouji Murakami, Ryo Kurazume(Kyushu University), Yosuke Senta, Yoshihiko Kimuro and Takafumi Ienaga(Institute of Systems & Information Technologies), [Japan](#) **369**
- TS16-5** Minimally Invasive Orthopedic Surgery System Based on Biologically Compatible Processes **(KRS131)**
Mamoru Mitsuishi and Naohiko Sugita(The University of Tokyo), [Japan](#) **374**

TS17: Interactive Human-Space Design and Intelligence

Session Chair : Kazuyoshi Wada
Tokyo Metropolitan University, Japan

- TS17-1** Intelligent Ambience-Robot Cooperation-Closing Door with Humanoid Robot- **(KRS064)**
Takeshi Sakaguchi(JRL, AIST), Takeshi Ujiie, Shinichi Tsunoo(Tokyo Metropolitan University) Kenichi Oohara(IS, AIST), Neo Ee Sian(JRL, AIST) and Kazuhito Yokoi(JRL, AIST), [Japan](#) **383**
- TS17-2** Multiple Objects Localization in Intelligent Space - Utilizing User Hands Position Information from Position Server - **(KRS068)**
Kouhei KAWAJI, Qinhe WANG, Takeshi SASAKI and Hideki HASHIMOTO(Univ. of Tokyo), [Japan](#) **389**
- TS17-3** Information Recommendation Module for Human Robot Communication Support under TV Watching Situation **(KRS092)**
Yasufumi Takama, Hiroki Namba(Tokyo Metropolitan University), Yoshihiro Iwase(NEC Corporation) and Toru Yamaguchi(Tokyo Metropolitan University), [Japan](#) **395**

- TS17-4** Evaluation of Mental Stress by Analyzing Accelerated Plethysmogram Applied Plethysmogram Applied Welfare Space based on Ambient Intelligence **(KRS093)**
Yasunari Fujimoto(Tokyo Metropolitan Institute of Technology) and
Toru Yamaguchi(Tokyo Metropolitan University), **Japan** **401**
- TS17-5** A common platform for Robot Services through Robot Services Initiative (RSi) activities **(KRS103)**
Masahiko Narita, Makiko Shimamura(Fujitsu Limited), Ryota Hiura(Mitsubishi Heavy) and
Toru Yamaguchi(Tokyo Metropolitan), **Japan** **405**
- TS17-6** Development of the Home Appliance Component using RTC-Lite **(KRS110)**
Takashi SUZUKI, Toshiyuki KUSUNOKI and
Kazuyoshi WADA(Tokyo Metropolitan University), **Japan** **409**



Poster Session

- PO-1** Development of Intelligent BioRobot Platform for Integrated Clinical Test **(KRS008)**
Byung June Choi, Sung Moon Jin, Seung Hoon Shin, Ja Choon Koo, and Hyouk Ryeol
Choi(Sungkyunkwan University), JinHyun Kim(Seoul National University), Ki Tak Ahn(Pohang Institute of
Intelligent Robotics), Sung Moo Ryew(KnR System Inc.), Woong Hee Son(Korea Institute of Industrial
Technology) and Wankyun Chung(POSTECH), **Korea** **417**
- PO-2** Development of Flexible Mobile Agents for BioRobot System in the Clinical Laboratory **(KRS009)**
Byung June Choi, Sung Moon Jin, Seung Hoon Shin, Ja Choon Koo, Hyouk Ryeol
Choi(Sungkyunkwan University), JinHyun Kim(Seoul National University), Ki Tak Ahn(Pohang Institute of
Intelligent Robotics), Min Cheol Kim(Robotous Co.), Woong Hee Son(Korea Institute of Industrial
Technology) and Wankyun Chung(Pohang University of Science and Technology), **Korea** **423**
- PO-3** Parameter Identification of Dynamic Systems using Hamiltonian Regressor **(KRS012)**
Youngjin Choi and Byung-Ju Yi(Hanyang University), **Korea** **429**
- PO-4** Conflict Evaluation Method for Building Grid Maps with Sonar Sensors **(KRS013)**
Kyoungmin Lee and Wan Kyun Chung(Pohang University of Scienceand Technology) and
SangYep Nam(Kook Je College), **Korea** **433**
- PO-5** Active Resampling for Rao-Blackwellized Particle Filter **(KRS016)**
Chanki Kim, Rathinasamy Sakthivel and Wan Kyun Chung(POSTECH), **Korea** **439**

PO-6	Multivariate Fuzzy Decision Tree for Hand Motion Recognition (KRS017) Moonjin Jeon, Jun-Hyeng Do, Sang-Wan Lee, Kwang-Hyun Park and Zeungnam Bien(KAIST), Korea	446
PO-7	A Map Merging Technique using the Fingerprint Matching Method in Multi-Robot FastSLAM (KRS021) Heon-Cheol Lee, Nosan Kwak, In-Kyu Kim and Beom-Hee Lee(Seoul National University), Korea	452
PO-8	A New Motion Planning Algorithm for a Biped Robot Using Kinematic Redundancy and ZMP Constraint Equation (KRS023) Jae Yeon Choi, Youngjin Choi and Byung-Ju Yi(Hanyang University), Korea	458
PO-9	Example-based Spoken Dialog Processing for Guidance Robots (KRS027) Cheongjae Lee, Seokhwan Kim, Minwoo Jeong, Sangkeun Jung, Donghyeon Lee and Gary Geunbae Lee(POSTECH), Korea	464
PO-10	Robust Localization for Mobile Robots in Dynamic Environment (KRS029) Jung Suk Lee and Wan Kyun Chung(POSTECH), Korea	468
PO-11	Real-time Simultaneous Localization and Mapping using Omnidirectional Vision (KRS030) Chae-Young Kim, Jong-Sung Kim and Ki-Sang Hong(POSTECH), Korea	474
PO-12	Systematic Error Calibration of Mobile Robot using Home Positioning Function (KRS031) Youngmok Yun, Wan Kyun Chung(POSTECH) and Sang Yep Nam(Kook Je College), Korea	480
PO-13	Expression-Invariant Face Recognition Using Tensor Based Image Transformation (KRS037) Hyung-Soo Lee and Daijin Kim(POSTECH), Korea	486
PO-14	Development of Omnidirectional Human Detection System for Mobile Robot (KRS038) Dhi Aurrahman, Nurul Arif Setiawan, Chi-min Oh(Chonnam National University), Suk-june Yoon(Samsung Electronics) and Chil-woo Lee(Chonnam National University), Korea	492
PO-15	Realization of a Service Robot HSR-I for Environment Security (KRS039) Lijun Zhao, RuiFeng Li, Lining Sun, Lianzheng Ge and Xin Du(Harbin Institute of Technology), China	497
PO-16	Laser Scanner-based Navigation for Indoor Service Robot (KRS043) Jeong-Gwan Kang, Su-Yong An, Won-Seok Choi and Se-Young Oh(Pohang University), Korea	503
PO-17	A Digitally Trimmable Continuous-Time Capacitive Readout ASIC for MEMS vibratory gyroscope for Robot Applications (KRS045) Hyoungcho Ko(Seoul National University), Taedong Ahn(SML Electronics), Byoungdoo Choi, Sangmin Lee, Namkuk Kim and Dong-il “Dan” Cho(Seoul National University), Korea	509

PO-18	State Estimation with Delayed Observations Considering Uncertainty in Time (KRS049) Minyong Choi, Wan Kyun Chung(POSTECH), Sangyup Yi, Wonsub Choi and Kyong-Sok Chang(Simlab Co., Ltd.), Korea	513
PO-19	Robust Data Association for the EKF-based SLAM (KRS050) Jinwoo Choi, Wan Kyun Chung(POSTECH) and Sang Yep Nam(Kook Je College), Korea	517
PO-20	Development of a scheduling algorithm for efficient tests on Bio Robot (KRS055) Seung Hoon Shin, Sung Moon Jin, Byung June Choi, Hyouk Ryeol Choi, Ja Choon Koo (Sungkyunkwan University), Jung Woo Kim, Sung Moo Ryew(KnR System Inc.), Wankyun Chung (POSTECH) and Woong Hee Son(Korea Institute of Industrial Technology), Korea	523
PO-21	Navigation Strategy for the Robot in the Elevator Environment (KRS056) Won-Seok Choi, Jeong-Gwan Kang, Su-Yong An and Se-Young Oh(POSTECH), Korea	528
PO-22	A High-Performance, Low-Cost INS for Autonomous Mobile Robots (KRS059) Mahdi Jadaliha and Mohammad Mobed(Sharif University), Iran	534
PO-23	Robust Multidimensional Scaling for Multi-Robot Localization (KRS061) Hongmo Je and Daijin Kim(POSTECH), Korea	540
PO-24	Detection of Moving Objects by Optical Flow Matching in Mobile Robots using an Omnidirectional Camera (KRS067) Chi-min Oh, Nurul Arif Setiawan, Dhi Aurrahman, Chil-woo Lee(Chonnam National University) and Suk-june Yoon(Samsung Electronics), Korea	546
PO-25	Probabilistic Grid Matching Method for Grid-Based SLAM Using Sonar Sensors (KRS070) Byungjae Park and Wan Kyun Chung(POSTECH), Korea	550
PO-26	Robust Control of Coordinated Motion for Underwater Vehicle-Manipulator System with Minimizing Restoring Moments (KRS072) Jonghui Han and WanKyunChung(Pohang University of Science & Technology), Korea	554
PO-27	Efficient Feature Tracking for Visual SLAM by Pairwise Constraints (KRS073) Jungho Kim, Hyeongwoo Kim and In So Kweon(Korea Advanced Institute of Science and Technology), Korea	559
PO-28	The Binary Recognition Algorithm Using Point Correlation Template (KRS079) Y.S.Ihn, S.H.Ha, H.R.Choi, J.C.Koo(Sungkyunkwan University) and S.M.Lee(Korea Institute of Industrial Technology), Korea	564

PO-29	Flexible Docking Mechanism with Error-Compensation Capability for Auto Recharging System (KRS080)	
	Se-gon Roh, Jae Hoon Park, Young Kook Song, Hyouk Ryeol Choi(Sungkyunkwan University), Kwang Woong Yang, Moo Sung Choi, Hong Seok Kim and Ho Gil Lee(Korea Institute of Industrial Technology), Korea	570
PO-30	Terrain Classification Using Texture Recognition for autonomous robot (KRS084)	
	Hanbyul Joo and In-So Kweon(Korea Advanced Institute of Science and Technology), Korea	576
PO-31	Efficient Area Coverage Method for a Mobile Robot in Indoor Environments (KRS089)	
	Si Jong Kim, Jung Won Kang and Myung Jin Chung(Korea Advanced Institute of Science and Technology), Korea	580
PO-32	The implementation of URC Robot Management Server (KRS090)	
	Beom-Su Seo, Seung-Ik Lee and Sung Hoon Kim(ETRI), Korea	586
PO-33	Landing Platform for Experiment of Stable Humanoid Walking (KRS091)	
	Seyoung Cheon, Syungkwon Ra(Korea Institute of Science and Technology) and Youngpil Park(Yonsei University), Korea	592
PO-34	Redundancy-Based Navigation Algorithm for Swarm Robot Systems (KRS100)	
	Ho-Yul Lee, Eui-jung Lee, Yungjin Choi and Byung-Ju Yi(Hanyang University), Korea	598
PO-35	Gomy: The Baby Bear-like Robot for Emotional Human-Robot Interaction (KRS101)	
	Seong-Yong Koo and Dong-Soo Kwon(KAIST), Korea	603
PO-36	KOBIE: A Pet-type Robot with Emotional Behaviors (KRS107)	
	Jaehong Kim, Sangseung Kang, Cheonshu Park, Joung Woo Ryu, Jinhwan Oh, Joochan Sohn and Hyun Kyu Cho(ETRI), Korea	609
PO-37	Multi-Arm Path Generation Method for Humanoid Robots (KRS108)	
	Chang Jong Kim, Muhammad Asif Ali Rahmani, Sang Uk Ryu and Kyung Hyun Choi(Cheju National University), Korea	613
PO-38	Position Detection of KHST (Korean High Speed Train) using GPS System (KRS114)	
	Y. J. Han, C. S. Park, T. H. Lee, K. H. Kim and Y. M. Kim(KRRI), Korea	618
PO-39	Temperature Characteristics of Main Transformer for KHST using Sensors (KRS115)	
	Y. J. Han, K. H. Kim, C. S. Park, J. Y. Mok and S. S. Kim(KRRI), Korea	622
PO-40	A Study on Propulsion System Characteristics of KHST(Korean High Speed Train) (KRS116)	
	Y. J. Han(KRRI), Korea	626

PO-41	Traction System Characteristics of TTX(Tilting Train eXpress) Using Measurement System (KRS117)	
	Y. J. Han, S. G. Lee, C. S. Park, S. H. Han, J. S. Lee and Y. M. Kim(KRRI), Korea	630
PO-42	The Study of Tilting System Combination Test of EMU Tilting Train (KRS121)	
	S. G. Lee(KRRI), Korea	634
PO-43	Robot Arm Tele-operation using Wearable Electronic Device (KRS122)	
	HeeBae, Song, Doik, Kim, Minjun and Choi(Korea Institue Science and Technology), Korea	637
PO-44	A Study on Motor Temperature Characteristic of TTX (Tilting Train eXpress) (KRS123)	
	S. G. Lee, Y. J. Han and S. H. Han(KRRI), Korea	641
PO-45	Study on the URC robot simulation that used intelligent robot simulator (KRS124)	
	Keun-Eun Kim, Yi-Chul Kang(National Information Society Agency), Hyo-Young Lee , Suk-Joong Kim(ED Co., Ltd) and Sang-Yep Nam(Kookje College), Korea	644
PO-46	Contact Stability Analysis and Coordinative Manipulation of a Dextrous Robotic Finger Mechanism (KRS126)	
	N. K. Mandal(National Institute of Technical Teachers' Training and Research), A.Dutta and S. R. Deb(Jadavpur University), India	648
PO-47	Cosegmentation as a Generalized Correspondence Problem-A Motion Model Driven Approach (KRS127)	
	Ouk Choi and In So Kweon(Korea Advanced Institute of Science and Technology), Korea	654