

# Table of Contents

## WC01 : Network-Based Control Systems

WC01-1	<a href="#">New Results on Synchronization for Complex Dynamical Networks with Time-Varying Coupling Delay and Sampled-Data</a>	1
	J.H. Park and Tae-Hee Lee	
WC01-2	<a href="#">Decentralized guaranteed cost dynamic control for synchronization of a complex dynamical network</a>	7
	J.H. Park and Tae-Hee Lee	
WC01-3	<a href="#">Efficient Use of Bluetooth in Networked Control Systems</a>	13
	Ulugbek Umirov and Jung-II Park	
WC01-4	<a href="#">CoNeT Mobile Laboratory for Ethernet Based I/O Systems in Industrial Applications</a>	18
	Galip Cansever, Levent Ucun and Onur Akbatı	
WC01-5	<a href="#">Practical Consensus for Heterogeneous Linear Time-Varying Multi-Agent Systems</a>	23
	Jaeyong Kim, Jongwook Yang, Jungsu Kim and Hyungbo Shim	
WC01-6	<a href="#">A Method for Determining Classroom Seating Arrangements by Using a Genetic Algorithm</a>	29
	Kazuhiro Shinike	

## WC02 : Sliding Mode Control

WC02-1	<a href="#">Super-twisting algorithm-based sliding mode controller for a refrigeration system</a>	34
	Sangchul Won, Baeyoung Koo and Youngjun Yoo	
WC02-2	<a href="#">Sliding mode control for uncertain discrete-time system using robust model predictive control in reaching mode</a>	39
	Woogyong Kwon, Seongcheol Jeong and Sangchul Won	
WC02-3	<a href="#">Fault Tolerant Sliding Mode Control for a Nanosatellite</a>	44
	Miri Shin, Chul Woo Kang, Junkyu Lim and Chan Gook Park	
WC02-4	<a href="#">Robust Control for Seeker Scan Loop using Sliding Modes</a>	49
	Dharmveer Singh, Shailaja Kurode, Prasad Parkhi and Bhagyashri Tamhane	
WC02-5	<a href="#">Terminal Sliding Mode Control System with Minimum Convergence Time for DC Motor Systems</a>	55
	Seong-Kyun Jeong, Bo-Ram Kim and Kang-Bak Park	

## WC03 : [OS] Intelligent Mechatronic Systems I

WC03-1	<a href="#">On-line change detection and condition-based maintenance for a gradually deteriorating system</a>	59
	Mitra Fouladirad and Antoine Grall	
WC03-2	<a href="#">A Study on Wave Energy Conversion Using Direct Linear Generator</a>	64
	Cong Binh Phan and Kyoung Kwan Ahn	
WC03-3	<a href="#">An Investigation of Energy Saving by a Pressure Coupling Hydrostatic Transmission</a>	70
	Hoang Thinh DO and Kyoung Kwan Ahn	
WC03-4	<a href="#">DC Motor Parameters Identification and Sensorless Torque Estimation Using Fuzzy PID</a>	76
	Thanh Liem Dao and Kyoung Kwan Ahn	
WC03-5	<a href="#">Semi-Active Operation Assist Control Device for Manual Conveyance of Flexible Parts - Control System Design via Bilinear Optimal Control Theory -</a>	82
	Kensuke Yamaguchi, Michihiro Takeshige, Yoshifumi Morita, Noritaka Sato, Hiroyuki Ukai and Susumu Hara	

## WC04 : [OS] Intelligent Systems I

WC04-1	<a href="#">Observer-based decentralized fuzzy controller for discrete-time large-scale fuzzy systems with packet losses</a>	87
	Geun Bum Koo, Jin Bae Park and Young Hoon Joo	
WC04-2	<a href="#">S-Curve Profile Switching Method using Fuzzy System for Position Control of DC motor under Uncertain Load</a>	91
	Chang-Ho Hyun and Sang-Yun Lee	
WC04-3	<a href="#">Output Feedback Stabilization Condition for Nonlinear Systems Using Artificial T-S Fuzzy Model</a>	96
	Dae Young Kim, Jin Bae Park and Young Hoon Joo	
WC04-4	<a href="#">Neural Network Controller for Two-Degree-Freedom Helicopter Control System</a>	101
	Ribhan Zafira Abdul Rahman and Nusrat Jahan Shoumy	
WC04-5	<a href="#">Robust stabilization condition for a polynomial fuzzy system with parametric uncertainties</a>	107
	Han Sol Kim, Jin Bae Park and Young Hoon Joo	

## **WC05 : [OS] Running Technology of Rolling Stocks**

WC05-1	<a href="#">Fatigue analysis of railway wheels according to UIC standards</a>	112
	Manh-Tuan Ha and Chul-Goo Kang	
WC05-2	<a href="#">Roller Rig Tests of a Semi-Active Suspension System for a Railway Vehicle</a>	117
	Nam-Jin Lee, Chul-Goo Kang, Won-Sang Lee and Ton van Dongen	
WC05-3	<a href="#">Implementation of a hydraulic actuation for tilting of the Hanvit200 train</a>	123
	Ho-Yeon Kim, Jun-Ho Lee, Haeng-Seob Lee, Sung-Ho Han, Bong-Tak Kim and Chul-Goo Kang	
WC05-4	<a href="#">A Study on a Configuration of the Hydraulic Tilting Actuator and its Experimental Evaluations</a>	127
	Jun-Ho Lee and Seong-Ho Han	
WC05-5	<a href="#">Estimation on the ride comfort and running stability for tilting train on the Gyeongbu line in the Korean rail Network</a>	130
	Seong-ho Han, Su-Gil LEE and Hag-Lae RHO	

## **WC06 : Service and Field Robots I**

WC06-1	<a href="#">Giving Robots a Flexible Persona: The five factor model of Artificial Personality in Action</a>	133
	Kiwon Sohn, Saravanakrishnan Krishnamoorthy, Paul Oh and M. Anthony Lewis	
WC06-2	<a href="#">Cooperative control of differential wheeled mobile robots for box pushing problem</a>	140
	Moon Sungwon	
WC06-3	<a href="#">Vibration Reduction Algorithm of the Walking-will Recognition Sensor on Irregular Terrain</a>	145
	Dongkwang Lee, Min-Soo Goh, Jung-Shik Kong and Eung-Huyk Lee	
WC06-4	<a href="#">New In-Pipe Robot Capable of Coping with Various Diameters</a>	151
	Sari Yabe, Hiroyuki Masuta and Hun-ok Lim	

## **WC07 : Unmanned Vehicle Systems I**

WC07-1	<a href="#">Disturbance Observer based Trajectory Tracking Controller for Quadrotor</a>	157
	KOOKSUN LEE, Juhoon Back and Ick Choy	
WC07-2	<a href="#">Hovering Control of a Quadrotor</a>	162
	Keun Uk Lee, Han Sol Kim, Jin Bae Park and Yoon Ho Choi	
WC07-3	<a href="#">Systematization of Flight Instruction and Control for Autonomous Helicopter</a>	168
	Yuto Matsuzawa, Yuta Tozaki, Yuji Kameda, Masuhiro Nitta and Kiyotaka Kato	
WC07-4	<a href="#">Stereo Vision Based Collision Avoidance of Quadrotor UAV</a>	173
	Jongho Park and Youdan Kim	
WC07-5	<a href="#">Monitoring for Intrusion Behaviors with a Small UAV</a>	179

WC07-6	<a href="#">Cross-Track control of UAVs during circular and straight path following using sliding mode approach</a>	185
	M. Zamurad Shah, Raza Samar and Aamer Iqbal Bhatti	

## WC08 : Robot Vision

WC08-1	<a href="#">Implementation of Vision-based Real Time Helipad Detection System</a>	191
	Sewon Lee	
WC08-2	<a href="#">Geometrical measurement about welding shape using dual laser vision system</a>	195
	joonkil kim, Jinil Hong, Jaewoo Kim, Doojin Choi and Siyoul Rhee	
WC08-3	<a href="#">Hardware Architecture for Detecting Laser Point Using FPGA</a>	199
	ByungMoo Jeon, Duc Dung Ngyuen, SangJun Lee, Jung Dong Jin and Jae Wook Jeon	
WC08-4	<a href="#">FPGA Design and Implementation of a Real-Time Vehicle Detection System</a>	204
	Jungdong Jin, Vinh Dinh Nguyen, Sang Jun Lee and Jae Wook Jae	
WC08-5	<a href="#">Gesture-based Teleoperation using a Holonomic Robot</a>	208
	Alvaro Uribe, Byron Perez-Gutierrez and Silas Alves	
WC08-6	<a href="#">Object Recognition and Pose Estimation Using KLT</a>	214
	Hye-Jin Kim	

## WC09 : Industrial Applications of Control I

WC09-1	<a href="#">Optimized Recuperation Strategy for (Hybrid) Electric Vehicles based on Intelligent Sensors</a>	218
	Stefan Koehler, Alexander Viehl, Oliver Bringmann and Wolfgang Rosenstiel	
WC09-2	<a href="#">Charging and discharging cycle design for performance evaluation of HV batteries</a>	224
	Kouhei Komatsuzaki, Seiichi Shin and Kenji Sawada	
WC09-3	<a href="#">Modeling and Control of a Continuously Variable Transmission in a Constant Speed Power Take-Off Application</a>	229
	Irmak Aladagli, Theo Hofman, Maarten Steinbuch and Bas Vroemen	
WC09-4	<a href="#">Feasibility Test of Tracking Control to Moving Target in Dual-state Trolley Control System</a>	235
	Dongho Kim, Youngjin Park and Youn-sik Park	
WC09-5	<a href="#">Automatic Welding Robot System for the Horizontal Position in the Shipyard</a>	240
	Sunghoon Ko, Hyeong Soon Moon and Jeom Goo Kim	
WC09-6	<a href="#">Multi-Objective Design for Half-Car Active Suspensions</a>	246
	Semiha Turkay and Huseyin Akcay	

## WC10 : Sensors and Signal Processing

WC10-1	<a href="#">Energy based Memory Regulating System</a>	252
	JeongYon Shim	
WC10-2	<a href="#">Fault accommodation in systems described by finite automaton models</a>	255
	Alexey Zhirabok, Alexey Shumsky and Yevgeny Bobko	
WC10-3	<a href="#">A Energy-aware Clustering Algorithm via Game Theory for Wireless Sensor Networks</a>	261
	Yiping Yang, Chuan Lai, Lin Wang and Xiaofan Wang	
WC10-4	<a href="#">Satellite Attitude Determination in Post-processing Based on URTS Optimal Smoother</a>	267
	Jing Yang and Xuan Lei	
WC10-5	<a href="#">A Three-Stage CMOS OP Amplifier with a Dynamic Switching Bias Circuit</a>	273
	Hiroo Wakaumi	

## WD01 : Real-Time and Embedded Systems

WD01-1	<a href="#">An Implementation of the Enhanced-CAN BUS Network Connection in CAR Real-Time Embedded Software System</a>	277
	Chun-Shian Tsai	
WD01-2	<a href="#">Benchmarking Java Application using JNI and Native C Application on Android</a>	284
	Yeongjun Kim, Seunghyun Yoon, Seongjin Cho, Kiljae Kim, Eunhye Hwang, Jaewook Jeon and Seunghyun Yoon	
WD01-3	<a href="#">A recovery algorithm for PE files in a multi-core system</a>	289
	EunHye Hwang, Seong Jin Cho, Kil Jae Kim, Yeong Jun Kim, Seung Hyun Yoon and Jae Wook Jeon	
WD01-4	<a href="#">A Gateway for Multi-device Communication between Mechatrolink-III and RS-485</a>	294
	Tuan Thanh Dang, Jin Ho Kim, Dung Duc Nguyen and Jae Wook Jeon	
WD01-5	<a href="#">Development of High Performance Space Processor Emulator based on QEMU - Open Source Dynamic Translator</a>	300
	Jong-Wook Choi and Byeong-Gyu Nam	
WD01-6	<a href="#">Real-time optical flow measurement based on GPU architecture</a>	305
	Shogo Minami and Teruo YAMAGUCHI	

## WD02 : Adaptive Control

WD02-1	<a href="#">Fault diagnosis with adjustment of input distribution and controller reconfiguration for over-actuated feedback control system</a>	308
	Sungho Park, Youngjin Park and Seonjin Yim	
WD02-2	<a href="#">A Design of a Gain-Scheduling Controller by Convex optimization Satisfying Robust Performance Condition on the Nyquist Diagram</a>	312
	Yoshitaka Nishiguchi, Kazuhiro Yubai and Junji Hirai	
WD02-3	<a href="#">Robust Shape Control of Two SMA Actuators Attached to a Flexible Beam Based on DK Iteration</a>	316
	Farshid Alambeigi, Ali Zamani, Gholamreza Vossoughi and Mohammad Reza Zakerzadeh	
WD02-4	<a href="#">Adaptive Trajectory Tracking of Quantum Systems</a>	322
	Jianxiu Liu, Shuang Cong and Yaping Zhu	
WD02-5	<a href="#">Control and synchronization of Lorenz systems via robust backstepping technique</a>	328
	YEASEOK PARK, Pyung-Hun Chang, Kyung-Soo Kim and Soohyun Kim	
WD02-6	<a href="#">Comparison of VRFT, NCbT and VRFT with Spline Fitting</a>	333
	Keisuke Kubota, Nobuhiko Koyama, Ichiro Kitamuki, Masuhiro Nitta and Kiyotaka Kato	

## WD03 : [OS] Intelligent Mechatronic Systems II

WD03-1	<a href="#">Control of mixing process in a novel micro-mixer</a>	337
	Behzad Otrodi, Mohammad Eghtesad, Mojtaba Mahzoon and Saeid Movahed	
WD03-2	<a href="#">Design and Implementation of LQR controller for Inverted Pendulum by use of REX Control System</a>	343
	Stepan Ozana, Martin Pies, Zdenek Slanina and Radovan Hajovsky	
WD03-3	<a href="#">Identification of Dielectric Electro Active Polymer actuator by Fuzzy NARX model and Particle swarm optimization</a>	348
	Truong B.N.M. and Kyoung Kwan Ahn	
WD03-4	<a href="#">Application of Grey predictor in controlling 5 DOF power assistant robot</a>	354
	Khoa Le and Kyoung Kwan AHN	
WD03-5	<a href="#">A novel design technique for IPMC diaphragm in micropump application</a>	360
	NAM DOAN NGOC CHI and Kyoung Kwan Ahn	

## **WD04 : [OS] Intelligent Systems II**

WD04-1	<a href="#">Evolving Internal Memory Strategies for the Woods Problems</a>	366
	Hyungu Yim and DaeEun Kim	
WD04-2	<a href="#">New delay-dependent stability criteria for T--S fuzzy systems with interval delay</a>	370
	Song Min Kook, Joo Young Hoon and Park Jin Bae	
WD04-3	<a href="#">Fuzzy Logic Model for Deodorizer Troubleshooting in Palm Oil Refining</a>	374
	Intan Salleh, Khairiyah Mohd-Yusof and Gholamreza Zahedi	
WD04-4	<a href="#">Stabilization of Fuzzy Descriptor Systems with Imperfect Premise Matching</a>	379
	Hojun Kim, Jinbae Park and Younghoon Joo	
WD04-5	<a href="#">Robust Model Free Fuzzy Adaptive Controller with fuzzy and crisp Feedback Error Learning schemes</a>	384
	Muhammad Bilal Kadri	

## **WD05 : [OS] Micro-Fluidic System for Industrial Printing**

WD05-1	<a href="#">Morphologies of Ag Dots Printed by Electrohydrodynamic (EHD) Jet Printing on a Silicon Wafer</a>	389
	Fariza Dian Prasetyo, Hadi Teguh Yudistira, VuDat Nguyen and DoYoung Byun	
WD05-2	<a href="#">Stabilizing Meniscus Shape to Improve Pattern Uniformity in Drop-On-Demand EHD Inkjet Printing Using Visual Feedback</a>	392
	Jungkeun Park, Trung Kien Nguyen, Doyoung Byun and Vu Dat Nguyen	
WD05-3	<a href="#">Fine Metal Line Patterning of ITO Ink Based On Electrohydrodynamic Printing</a>	395
	JAEYONG CHOI and sukhan lee	
WD05-4	<a href="#">A STUDY ON CONTROL OF JET PERFORMANCE FROM ELECTROSTATIC NOZZLE USING ORGANIC SOLVENTS</a>	398
	Soo-Hong Lee, XuanHung Nuyen and HanSeo Ko	
WD05-5	<a href="#">Analysis of Droplet Formation and Ejection from Electrohydrodynamic Nozzle Using Three-dimensional Tomography Method</a>	401
	XuanHugn Nguyen, Soo-Hong Lee and HanSeo Ko	

## **WD06 : Service and Field Robots II**

WD06-1	<a href="#">A Compact Wall-Climbing and Surface Adaptation Robot for Non-Destructive Testing</a>	404
	Hernando Leon Rodriguez, Tariq Sattar and Salman Hussain	
WD06-2	<a href="#">DESIGN AND DEVELOPMENT OF OBSTACLE DETECTION AND WARNING DEVICE FOR ABOVE ABDOMEN LEVEL</a>	410
	Anuar bin Mohamed Kassim	
WD06-3	<a href="#">Servo State Feedback Control of the Self Balancing Robot using MATLAB</a>	414
	Viriya Kongratana and Permpong Huantham	
WD06-4	<a href="#">Development of Wheeled Inverted Pendulum Type Personal Mobility with Pedal: Design of prototype platform and verification of basic driving function</a>	418
	Seonghee Jeong and Yuji Masuda	
WD06-5	<a href="#">Development of Koala Robot Capable of Expressing Various Kinds of Feelings</a>	424
	Fuminori Souma, Hiroyuki Masuta and Hun-ok Lim	

## **WD07 : Unmanned Vehicle Systems II**

WD07-1	<a href="#">Dynamics and Control of a Single Tilt-wing UAV</a>	430
	Sung-Tae Hong, Seung-Keun Kim, Jin-Young Suk, Moon-Kyou Lee, Keuk-Hee Bang and Do-Myung Kim	

WD07-2	<a href="#">Airdata system calibration using GPS velocity information</a> Am Cho, Young-shin Kang, Bum-jin Park, Chang-sun Yoo and Sam-ok Koo	433
WD07-3	<a href="#">Implementation of a BCF Mode Biomimetic Robotic-Fish Underwater Vehicle based on Lighthill Mathematical Model</a> ABHRA ROY CHOWDHURY	437
WD07-4	<a href="#">Collision Avoidance of Smart UAV in Multiple Intruders</a> Changsun Yoo, Am Cho, Bumjin Park, Youngshin Kang, Sang-wook Shim and Ilhyung Lee	443
WD07-5	<a href="#">Integrated Terrain Following Algorithm for UCAV</a> Gyeongtaek Oh, Hyoung-Seok Kim, Joong-Bo Seo and Youdan Kim	448
WD07-6	<a href="#">Robust Mobile Ground Target Localization Using Ground Image Features with UAV Position Compensation Techniques</a> Hyukseong Kwon, Rajnikant Sharma, Josiah Yoder and Daniel Pack	454

## **WD08 : [OS] Machine Vision and Its Application**

WD08-1	<a href="#">Localization of Mobile Robot using Laser Range Finder and IR Landmark</a> Jong-Eun Ha, Kangwook Her and Dong-Hwan Kim	459
WD08-2	<a href="#">Homographic Tracking Algorithm of Moving Objects for Multiple Video Surveillance System</a> Kyung-Taek Hong	462
WD08-3	<a href="#">Orientation based multi-scale corner detection for mobile robot application</a> Sungho Kim, In So Kweon and Wang-Heon Lee	466
WD08-4	<a href="#">Development of System for Shortest Path Searching in Urban Transportation Network</a> Wangheon Lee, Byuhng-Munn Suhng, Byoung Kyun Kim and Euichul Lee	469
WD08-5	<a href="#">Robust Face Region Discrimination and Eye tracking in the Environmental changes</a> Wangheon Lee, byoungkyun Kim, Byuhng-Munn Suhng and Euichul Lee	471
WD08-6	<a href="#">3D Vision Based Local Obstacle Avoidance Method for Humanoid Robot</a> Myotaeg Lim, Do Young Lee, Yan Feng Lu, Tae-Koo Kang and Inhwan Choi	473

## **WD09 : Industrial Applications of Control II**

WD09-1	<a href="#">Ring based In-vehicle network model with RAPIEnet</a> Joon Seok Oh and Dae Hyun Kwon	476
WD09-2	<a href="#">Comparative study of approximate, proximate, and fast model predictive control with applications to autonomous vehicles</a> Bo-Ah Kim, Seung-Hi Lee, Young Ok Lee and Chung Choo Chung	479
WD09-3	<a href="#">Energy management strategy for hybrid fuel cell vehicle</a> Ramon da Fonseca, Eric Bideaux, Bruno Jeanneret, Mathias Gerard, Matthieu Desbois-Renaudin and Ali Sari	485
WD09-4	<a href="#">Verify the Number of Soda Bottles in the Casket by using Computer Vision</a> Teerapong Orachon and Pattana Intani	491
WD09-5	<a href="#">Missing Step Detection in a High Speed Micro Stepping Motor Using Current Feedback</a> Dong Hwan Kim, Sung Wook Moon, Young Jin Kim and Yoon Taek Lim	494
WD09-6	<a href="#">Ultra-Small Electric Vehicle Competition Using Small Rechargeable Batteries - pico-EV Eco Challenge 2012 -</a> Yoshihiko Takahashi and Kazufumi Uda	498

## **WD10 : Signal Processing and Sensor Fusion**

WD10-1	<a href="#">Collision prediction system using intermittent ultrasonic wave</a> Masafumi Tokiwa and Teruo YAMAGUCHI	504
--------	---	-----

WD10-2	<a href="#">Sequential Measurement Processing for Tracking with an FMCW Radar Network</a> Dae-Bong Kim and Sun-Mog Hong	508
WD10-3	<a href="#">A Camera-computer System to Support Safe Walking of a Blind Person</a> Ai Kanayama and Seiji ishikawa	511
WD10-4	<a href="#">Applying MSC-HOG Feature to the Detection of a Human on a Bicycle</a> HEEWOOK JUNG	514
WD10-5	<a href="#">CFAR Detectors Employed by Radar Sensor Systems</a> Modar Shbat, Joon Hyung Yi and Vyacheslav Tuzlukov	518
WD10-6	<a href="#">Local Stereo Matching Using an Variable Window, Census Transform and an Edge-preserving Filter</a> VINH DINH, Duc Dung Nguyen, Dinh Vinh Nguyen and Jeon Jae Wook	523

## **TA01 : [OS] Recent Advances in Process Control and Monitoring I**

TA01-1	<a href="#">Batch Process Control, From Traditional Approaches to 2D Control</a> Yi Yang, Shengyong Mo and furong gao	529
TA01-2	<a href="#">Fast moving horizon estimation for a distributed parameter system</a> Hong Jang, Kwang-Ki K. Kim, Jay H. Lee and Richard D. Braatz	533
TA01-3	<a href="#">Carbon Dioxide Capture Processes: Simulation, Design and Sensitivity Analysis</a> Muhammad Zaman, Jay Hyung Lee and Rafiqul Gani	539
TA01-4	<a href="#">Industrial Applications of Locally Weighted PLS to Realize Maintenance-Free High-Performance Virtual Sensing</a> MANABU KANO, Sanghong Kim, Ryota Okajima and Shinji Hasebe	545
TA01-5	<a href="#">IMC-PID controller tuning from closed-loop setpoint response</a> Mudassir Hasan, Mohammad Shamsuzzoha and Moonyong Lee	549
TA01-6	<a href="#">Efficient Quadratic Programming Algorithm for Model Predictive Control</a> Junghwan Kim and Kwang Soon Lee	553

## **TA02 : Disturbance Observer**

TA02-1	<a href="#">Analysis of Discrete-time Disturbance Observer and a New Q-filter Design Using Delay Function</a> Chanhwa Lee, Youngjun Joo and Hyungbo Shim	556
TA02-2	<a href="#">A Novel Disturbance Observer using Adaptive Observation and Time Delay Estimation in Discrete Time Systems</a> Sung Hwan Kim, Kyung Soo Kim and Soo hyun Kim	562
TA02-3	<a href="#">Disturbance Observer Design Based on Linearized Vehicle Model for Unequal Tractive/Braking Force Identification</a> Jiwon Oh, Seibum Choi and Daeil Kim	567
TA02-4	<a href="#">On the Unified Approach to the Disturbance Observer</a> Seul Jung	573
TA02-5	<a href="#">Experimental Studies of a Disturbance Observer for Attitude Control of a Quad-Rotor System</a> Seung Ho Jeong and Seul Jung	579

## **TA03 : Process Systems**

TA03-1	<a href="#">Using Matlab for Thermal Processes Modeling and Prediction at Mining Dumps</a> Radovan Hajovsky, Blanka Filipova, Martin Pies and Stepan Ozana	584
TA03-2	<a href="#">Improving Process Data Reporting System Using IT Process Automation Software in Sulfuric Acid Production</a> Prasit Julsereewong, Sakchai Sookjadit, Teerawat Thepmanee and Amphawan Julsereewong	588

TA03-3	<a href="#">Dynamic Modeling, Simulation and Control (using MPC) of an Industrial Steam Reformer</a> Sankararao Boddupalli and Jay Hyung Lee	594
TA03-4	<a href="#">A Study About The Ship Status Verification System Using Data Signal Processing</a> Jihun Yu, Seokmin Jang, Eunyoung Kim, Raesoo Lim, Hokyeong Kim, Yeohwan Yoon and Jooho Heo	601
TA03-5	<a href="#">Steel-yard Planning Support System : Optimizing the Steel-yard Planning and Performance Evaluation with Simulation</a> SEOKHYUN LEE, JIHUN YU, EUNYOUNG KIM, WOOSUNG CHOI, RAESOO LIM, HOKYEONG KIM and JOOHO HEO	605
TA03-6	<a href="#">A Design of Fuzzy PID Controller Based on ARM7TDMI for Coupled-Tanks Process</a> Arjin Numsomran	610

#### **TA04 : [OS] Intelligent Systems III**

TA04-1	<a href="#">Pedestrian Detection Approach Based on Modified Haar-Like Features and AdaBoost</a> Van-Dung Hoang, Kang- Hyun Jo and Andrey Vavilin	614
TA04-2	<a href="#">Optical Flow Estimation and Error Analysis in Projective Space</a> Teruo YAMAGUCHI and Hiroyasu SHINBORI	619
TA04-3	<a href="#">Vision-based Vehicle Detection and Inter-Vehicle Distance Estimation</a> Giseok Kim and Jae-Soo Cho	625
TA04-4	<a href="#">Autonomous Vehicle Detection System using Visible and Infrared Camera</a> Jisu Kim, Sungjun Hong, Jeonghyun Baek, Euntai Kim and Heejin Lee	630
TA04-5	<a href="#">Adaptive ROI-based Autonomous Pedestrian Detection System</a> Jeonghyun Baek, Sungjun Hong, Jisu Kim, Euntai Kim and Heejin Lee	635

#### **TA05 : [OS] Command Generation for Flexible System Control**

TA05-1	<a href="#">[Invited Paper] Using Approximate Multi-crane Frequencies for Input Shaper Design</a> Joshua Vaughan, Jieun Yoo and William Singhose	639
TA05-2	<a href="#">Modeling and Input Shaping Control of a Micro Coaxial Radio-Controlled Helicopter Carrying a Suspended Load</a> Christopher Adams, James Potter and William Singhose	645
TA05-3	<a href="#">Command Shaping for Vibration Reduction of Container Cranes</a> Quang Hieu Ngo, Keum-Shik Hong and Yanghai Nan	651
TA05-4	<a href="#">Vibration reduction for positioning-system base subjected to moving stage using command shaping</a> Seong-Wook Hong, Gyu-Hyun Bae and Ah-Young Park	656
TA05-5	<a href="#">Input Command Generation for Flexible Systems with 2nd-Order Actuators</a> Yoon-Gyung Sung, Yoon-Sang Min and A-Ra Ko	661
TA05-6	<a href="#">Using Input Shaping to Repress Two-mode Residual Vibration on Aerial Lifts</a> Hongxia Jia, Fumin Zhu and Joshua Vaughan	667

#### **TA06 : Robot Mechanism and Control I**

TA06-1	<a href="#">Tool-Point Control of a Planar Hydraulically Actuated Manipulator with Compensation of Non-Actuated Degree of Freedom</a> Magnus Berthelsen Kjelland, Michael R. Hansen, Ilya Tyapin and Geir Hovland	672
TA06-2	<a href="#">Tracking Control of Snake-like Robot with Rotational Elastic Actuators</a> Syunsuke Nansai and Masami Iwase	678
TA06-3	<a href="#">Dynamic Modeling of Glass Substrate Transfer Robot Arm System by using 5-Revolute Joints Manipulator Modeling Method</a>	684



	Minsu Jegal, Tae-hyun Kim, Seok-hyun Hong and Hyun-seok Yang	
TA06-4	<a href="#">Design and Workspace Analysis of a New Endoscopic Parallel Manipulator</a> Khalil Ibrahim, Ahmed Ramadan, Mohamed Fanni, Kobayashi Yo, Ahmed Abo-Ismael and Masakatsu Fujie	688
TA06-5	<a href="#">Kinematic and Force Analysis of a 6 Degrees of Freedom 3-UPS Mechanism with Triangular Platform for Haptic Applications</a> Mohammad Khodabakhsh, Mehdi Sadeghpour, Soroosh Hassanpour and Gholamreza Vossoughi	694

## TA07 : [OS] Autonomous Vehicle System

TA07-1	<a href="#">Study and Dvelopment of The VDC Algorithm for Independent AWD Autonomous Vehicle</a> Hae-Rim Yang, Chan-Se Jeoung, Ok-Jae Lee and Soon-Yong Yang	699
TA07-2	<a href="#">Control of Virtual Excavating System Base on Real-time Simulation</a> Quang Hoan Le, Young-man Jeong, Chi Thanh Nguyen and Soon-Yong Yang	703
TA07-3	<a href="#">A Study on Safety Steering for 3 Wheel Autonomous Vehicle</a> Joo-Hyun Ko, Chan-Se Jeong, Young-Man Jeong and Soon-Yong Yang	708
TA07-4	<a href="#">Robust Back-Stepping Control of Vehicle Steering System</a> Kyoung Taik Park, YoungJin Lee and Han Me Kim	712
TA07-5	<a href="#">Position Control of Mobile Two Wheeled Inverted Pendulum Robot by Sliding Mode Control</a> JungSu Ha and JuJang Lee	715
TA07-6	<a href="#">State Etimation of the Nonlinear Suspension System based on Nonlinear Kalman Filter</a> Sung-Soon Yim, Joon-Hong Seok and Ju-Jang Lee	720

## TA08 : Human-Robot Interaction I

TA08-1	<a href="#">Self-Initiated Imitation Learning. Discovering what to imitate</a> Yasser Mohammad and Toyoaki Nishida	726
TA08-2	<a href="#">Simulation and Analysis of Dynamics of the Force-free Control for Industrial Robot Arms</a> Achala Pallegedara, Yoshitaka Matsuda, Naruto Egashira, Takenao Sugi and Satoru Goto	733
TA08-3	<a href="#">Human Anthropomorphic Gripper as an Automation Tool</a> Hernando Leon Rodriguez, alvaro Uribe and Edgar Diaz	739
TA08-4	<a href="#">Preliminary Drawing Test via Predictive Energy Bounding Algorithm for Time-Delayed Bilateral Teleoperation</a> Riaz Uddin and Jeha Ryu	745
TA08-5	<a href="#">Modified Bilateral Control by Using Intervention Impedance Based on Passivity of Flexible Master-Slave Manipulators and Its Design Methods</a> Takahiko Mori	748
TA08-6	<a href="#">Optimal EEG Feature Extraction based on R-square Coefficients for Motor Imagery BCI System</a> Pharino Chum, Seung-Min Park, Kwang-Eun Ko and Kwee-Bo Sim	754

## TA09 : Actuators

TA09-1	<a href="#">A Method for Reliable Motion Control of Pressure Compensated Hydraulic Actuation with Counterbalance Valves</a> Pal Andre Nordhammer, Morten Bak and Michael Hansen	759
TA09-2	<a href="#">Reducing the Static Friction in Hydraulic Cylinders by Maintaining Relative Velocity Between Piston and Cylinder</a> Morten Ottestad, Nicolai Nilsen and Michael Hansen	764
TA09-3	<a href="#">Development of High Performance Shoes with Human Compatibility</a> Yasuhiro Hayakawa	770

TA09-4	<a href="#">Controlling the Slewing Motion of Hydraulically Actuated Cranes Using Sequential Activation of Counterbalance Valves</a>	773
	Pal Andre Nordhammer, Morten Bak and Michael Hansen	
TA09-5	<a href="#">Improved Speed Control using Anti-Windup PI Controller for Direct Torque Control based on Permanent Magnet Synchronous Motor</a>	779
	Kraisorn Klinlaor and Nontawat Chuladaycha	
TA09-6	<a href="#">A Recognition of the mode of dynamic motions of a vertical –rotating wind turbine in wind power station for the fault detections by indirectly measuring in bearing</a>	784
	rai wung park	

## TA10 : Fault Diagnosis

TA10-1	<a href="#">A n-dimensional Convex Hull Approach for Fault Detection and Mitigation for High Degree of Freedom Robots Humanoid Robots</a>	790
	Daniel Lofaro, Kevin Lynch and Paul Oh	
TA10-2	<a href="#">Balance Weight Fault Detection in Compressor Using FFT Algorithm</a>	798
	Vittaya Tipsuwanporn, Arjin Numsomran and Mongkol Leawsoong	
TA10-3	<a href="#">Development of Corrosion Rates Estimation method for CUI using Information Gain Ratio</a>	803
	Shigeyuki Tateno and Motoki Ichiyama	
TA10-4	<a href="#">Principal Components Analysis based Fault Detection and Isolation for Electronic Throttle Control System</a>	808
	Moussa Hamadache and Dongik Lee	
TA10-5	<a href="#">Bearing Fault Effect on Induction Motor Stator Current Modeling based on Torque Variations</a>	814
	Jaehoon Kim, Inseok Yang, Donggil Kim, Moussa Hamadache and Dongik Lee	
TA10-6	<a href="#">Reliability Improvement of Closed Loop Control Systems Via Observer Based Sensor Compensation</a>	819
	ernie che mid	

## TD01 : [OS] Recent Advances in Process Control and Monitoring II

TD01-1	<a href="#">Dynamic Simulation and Model Predictive Control for Gas Antisolvent Recrystallization Process</a>	825
	Shin Je Lee, Sungho Kim, Hyoun-Soo Kim, Youn-Woo Lee and Jong Min Lee	
TD01-2	<a href="#">Global Approximation of Unsteady-State Diffusion and Reaction in Slab, Cylinder and Sphere Catalysts</a>	830
	Jietae Lee	
TD01-3	<a href="#">An auto-framing method for stochastic process signals for fault detection by using a hidden Markov model based approach</a>	834
	Hana Lee and Jay H. Lee	
TD01-4	<a href="#">Frequency Response Model Identification Method for Discrete-time Processes with Final Cyclic-Steady-State</a>	840
	Kyung Hwan Ryu, Kyung Su Kim, Ho Suk Kang, Si Nae Lee, Jun Young Cho, Jitae Lee and Su Whan Sung	
TD01-5	<a href="#">Raman-based estimation of glucose concentration for on-line monitoring of biological process</a>	845
	Jong Min Lee, Se-Kyu Oh, Sung Jin Yoo and Shin Je Lee	

## TD02 : Estimation

TD02-1	<a href="#">On-line estimation of lactic acid concentration during batch fermentations of Streptococcus thermophilus based on pH measurement</a>	851
	Eduard Peter and Helmut Röck	
TD02-2	<a href="#">Maximum friction estimation and longitudinal control for a full in-wheel electric motor vehicle</a>	856
	Marcel-Stefan Geamanu, Arben Cela, Guenaël LeSollic, Hugues Mounier and Silviu-Iulian	

	Niculescu	
TD02-3	<a href="#">Integrated vehicle mass estimation using longitudinal and roll dynamics</a>	862
	Daeil Kim, Seibum B. Choi and Jiwon Oh	
TD02-4	<a href="#">Parameters Effect in Sampling Importance Resampling (SIR) Particle Filter Prediction and Tracking of Flood Water Level Performance</a>	868
	Fazlina Ahmat Ruslan, Ramli Adnan, Abd Manan Samad and Zainazlan Md Zain	
TD02-5	<a href="#">Survey of a controller design method based on experimental data, and a proposal of data conversion method</a>	873
	Nobuhiko Koyama, Keisuke Kubota, Ichiro Kitamuki, Masuhiro Nitta and Kiyotaka Kato	
TD02-6	<a href="#">Collision Prediction System for External Airbag Using an Integrated Multiple Model Estimation Algorithm with Multirate Kalman Filter</a>	878
	Chang Mook Kang, Youngseop Son, Young Ok Lee, Chung Choo Chung and Seung-Hi Lee	

### **TD03 : Optimal Control**

TD03-1	<a href="#">Randomly occurring Leader-following Consensus criterion for Multi-agent systems with Communication delay</a>	883
	Myeongjin Park, Ohmin Kwon, Juhyun Park, Sangmoon Lee and Kihoon Kim	
TD03-2	<a href="#">Dual LMI Approach to Linear Positive System Analysis</a>	887
	Yoshio Ebihara	
TD03-3	<a href="#">IMC-Based PID Controllers Design for Torsional Vibration System</a>	892
	Viriya Kongratana and Aniwat Detchrat	
TD03-4	<a href="#">Action-Dependent Updated Terminal Cost Receding Horizon Control for Discrete-Time Linear Systems</a>	896
	Mi Youn Moon, Jae Young Lee, Jin Bae Park and Yoon Ho Choi	
TD03-5	<a href="#">Design of Deadbeat Controller by Polynomial Approach</a>	902
	Stepan Ozana, Martin Pies and Radovan Hajovsky	
TD03-6	<a href="#">Dynamic Optimization of Guided Missile Trajectory by Use of Matlab and Dynopt Toolbox</a>	908
	Stepan Ozana, Martin Pies and Petr Wagner	

### **TD04 : Recent advances in Intelligent Mechatronics**

TD04-1	<a href="#">Optimization of Four-bar Steering Mechanism through Artificial Immune System (AIS) Algorithm</a>	913
	Yousof Ebneddin Hamidi, Morteza Saeidi Javash, Mir Mohammad Etefagh and Farshid Abbasi Doust	
TD04-2	<a href="#">Using ILS Mathematical Model and Measurements for Detailed Evaluating Results of Thermal Response Tests</a>	918
	Radovan Hajovsky, Petr Vojcinak and Jiri Koziorek	
TD04-3	<a href="#">A Control Strategy for Designing an Intelligent Controller for Highly Dynamic/Perturbed Systems</a>	924
	Omar Mehrez and Ahmed Ramadan	
TD04-4	<a href="#">Stabilization Analysis of Stochastic Hopfield Neural Networks</a>	930
	Xuyang Lou, Qian Ye and Baotong Cui	
TD04-5	<a href="#">Quantized Feedback Control for Hybrid Impulsive Systems</a>	934
	Qian Ye, Baotong Cui and Xuyang Lou	

### **TD05 : [OS] Advanced Mechatronic Systems**

TD05-1	<a href="#">Incremental Displacement Estimation (IDE) for Structural Health Monitoring Robot</a>	937
	Haemin Jeon, Jae-Uk Shin, Wancheol Myeong and Hyun Myung	
TD05-2	<a href="#">Adaptive Resource Allocation in Mobile Ad Hoc Computational Grids</a>	941

	Sayed Chhattan Shah and Wan Sik Choi	
TD05-3	<a href="#">Cartesian Trajectory Control of Humanoid Robot Arms Based on a Disturbance Observer</a> Yeong-geol Bae and Seul Jung	947
TD05-4	<a href="#">Synchronization Method for Laser Scanner and Robot</a> Hee Shin Kang, Ji Whan Noh and Sung Jo Kwak	952
TD05-5	<a href="#">Design and Implementation of Path Generation Algorithm for Controlling Autonomous Driving and Parking</a> Kyoungwook Min, JeongDan Choi, Hangeun Kim and Hyun Myung	956

## TD06 : Robot Mechanism and Control II

TD06-1	<a href="#">Visual Odometry for Outdoor Environment using a Downward-Tilting Camera and Self-Shadow Removal Algorithm</a> Sungho Hong, Jae-Bok Song, Joo-Hyun Baek and Jae-Kwan Ryu	960
TD06-2	<a href="#">TAO – A Software Platform for Autonomous Mobile Robots</a> Silas Alves, João Maurício Rosário, Humberto Ferasoli Filho and Ivan Nunes da Silva	964
TD06-3	<a href="#">An Efficient Backtracking Strategy for Frontier Method in Sensor-based Random Tree</a> Jinho Kim, Kie Jeong Seong and H. Jin Kim	970
TD06-4	<a href="#">Departability Motion for Car-like Robot Based on GVG Roadmap</a> QUAN YUAN, Changsoo Han and Ji Yeong Lee	975
TD06-5	<a href="#">RSSI-Based Control of Mobile Cooperative Robots for Seamless Networking</a> Hyun-Ja Im, Chang-Eun Lee, Young-Jo Cho and Sunghoon Kim	980
TD06-6	<a href="#">Natural Corners Extraction Algorithm in 2D Unknown Indoor Environment with Laser Sensor</a> Ruijun Yan, Jing Wu, Weijun Wang, Sungjin Lim, Jiyeong Lee and Changsoo Han	983

## TD07 : [OS] UGV(Unmanned Ground Vehicle) System

TD07-1	<a href="#">Design and Development of Magnetic Position Sensor for Magnetic Guidance System of Automated Ground Vehicle</a> Young J. Ryoo	988
TD07-2	<a href="#">Quadtree based Path Planning for Unmanned Ground Vehicle in Unknown Environments</a> Young-Min Han, jinbeom jeong and Jung-Ha Kim	992
TD07-3	<a href="#">Research of V2I Situated Cognition System based on LiDAR</a> Jaehwan Kim, Jung-ha Kim, Je-Uk Lee and Bok-Joong Yoon	998
TD07-4	<a href="#">Development of a Multi-resolution Parallel Genetic Algorithm for Autonomous Robotic Path Planning</a> Carl Crane and Drew Lucas	1002
TD07-5	<a href="#">A modified Dynamic Window Approach in crowded indoor environment for intelligent transport robot</a> Baehoon Choi, Beomseong Kim, Euntai Kim and KwangWoong Yang	1007
TD07-6	<a href="#">Indoor Localization using Laser Scanner and Vision Marker for Intelligent Robot</a> Beomseong Kim, Baehoon Choi, Euntai Kim and KwangWoong Yang	1010

## TD08 : [OS] Human-Robot Interaction II

TD08-1	<a href="#">Human Posture Measurement in a Three-Dimensional Space Based on Inertial Sensors</a> Pyoung-gook Jung, Gukchan Lim and Kyoungchul Kong	1013
TD08-2	<a href="#">TorqueMode Control of a Bowden Cable-Driven Assistive System</a> Kyoungchul Kong and Joonbum Bae	1017
TD08-3	<a href="#">Gait Phase-Based Control for a Knee Assistive System</a> Joonbum Bae and Kyoungchul Kong	1021

TD08-4	<a href="#">Gait Analysis based on a Hidden Markov Model</a> Joonbum Bae	1025
TD08-5	<a href="#">Back-Drivability Recovery of a Full Lower Extremity Assistive Robot</a> Byeonghun Na, Joonbum Bae and Kyoungchul Kong	1030
TD08-6	<a href="#">Multi-Class Stationary CSP for Optimal Feature Separation of Brain Source in BCI System</a> Thanh Ha Nguyen , Seung-Min Park, Kwang-Eun Ko and Kwee-Bo Sim	1035

## TD09 : Industrial Applications of Control III

TD09-1	<a href="#">The Verification Method for Control Logic Diagram of APR 1400 using Logic Translator</a> Sunmi Choi and Heetaek Lim	1040
TD09-2	<a href="#">Quality Measurement Of Template Models And Automatic Template Model Selection</a> HYOHOON CHOI, Ram Mohan Gupta and SUNGHO SUH	1044
TD09-3	<a href="#">Decoupling Control of 2-link Manipulator with Model Following Control and Proposed Control Gains Design</a> linfeng lan	1049
TD09-4	<a href="#">Low-Cost Automatic Screw Machine Using a Commercial Electric Screwdriver</a> Jooyeon Hwang, Doohee Jung, Youngjun Roh, Keejun Nam and Dalyeon Hwang	1055
TD09-5	<a href="#">Development of 4 Degree-of-Freedom ultra-precision Stage with millimeter motion range</a> Dahoon Ahn, Youngman Choi, Siwoong Woo and Jaehwa Jeong	1061
TD09-6	<a href="#">How to Diagram a Production Control System</a> Sabah Al-Fedaghi and Faisal Al-Shahin	1065

## TD10 : Sensors and Instrumentation

TD10-1	<a href="#">Simple Resistance-to-Period Converter for Resistive Sensors</a> Apinai Rerkratn, Jaturon Tongpakpanang, Anucha Kaewpoonsuk, Wandee Petchmaneelumka and Vanchai Riewruja	1071
TD10-2	<a href="#">Simple Interface Circuit with Lead-Wire-Resistance Compensation for Single Resistive Sensors</a> Wandee Petchmaneelumka, Prasit Julsereewong, Amphawan Julsereewong and Jaturon Tongpakpanang	1076
TD10-3	<a href="#">Auto Gain Tuning Algorithm for Automation of Atomic Force Microscope</a> Jiseong Jeong, Jisoo Kim, Kyihwan Park and Jong-kyu Jung	1080
TD10-4	<a href="#">Development of a Knee Brace with a Locking Mechanism and its Locking Control to Reduce Applied Load to the Knee</a> carlos reyes, Soon Geul Lee and Chae hyeuk Lee	1083
TD10-5	<a href="#">On-line Drift Reduction for Portable Electronic Nose Instrument in Monitoring Indoor Formaldehyde</a> Jingwei Feng, Fengchun Tian, Bo Hu, Qi Ye, Bo Xiao and Jielian Guo	1088
TD10-6	<a href="#">Energy Efficient Distributed Interacting Multiple Model Filter in UWSNs</a> Changho Yu, JeongCheor Lee, JaeWeon Choi, Myeong-Kwan Park and DongJoong Kang	1093

## TCI : Interactive Session I

TCI-1	<a href="#">A High Performance CMOS Reference Current Generator with Negative Feedback Loop for Biomedical Neural Stimulator</a> Ko Hyoungho, Kyomuk Lim and Jindeok Seo	1099
TCI-2	<a href="#">Parallel Compressed Sensing Method to Accelerate MRI</a> Intaek Kim and Nguyet-Lan Vu	1103
TCI-3	<a href="#">Fast Thresholding Based on Improved Minimum Cross Entropy</a> Yongliang Zhang, Wen Zhang, Gang Xiao, Jiafa Mao, shanshan huang and Xiaowei Zheng	1108

TCI-4	<a href="#">An Electricity Energy and Water Consumption Model for Korean Style Apartment Buildings</a> Dongjun Suh, Yoon-Sik Yoo, Il-Woo Lee and Seongju Chang	1113
TCI-5	<a href="#">Robust Urban Road Surface Monitoring System using Bayesian Classification with Outlier Rejection Algorithm</a> IL YOUNG SONG and VLADIMIR SHIN	1118
TCI-6	<a href="#">Attraction Force Improvement Strategy of a Proportional Solenoid Actuator for Hydraulic Pressure Control Valve</a> So-Nam Yun, Young-Bog Ham and Jung-Ho Park	1123
TCI-7	<a href="#">MEMS vibratory gyroscope with highly programmable capacitive interface circuit</a> Ko HyoungHo, Kyomuk Lim and Jindeok Seo	1128
TCI-8	<a href="#">A Study on Energy Saving by Application of Energy Storage Device</a> Hanmin Lee	1132
TCI-9	<a href="#">MPPT Control of Photovoltaic System using the Two-Mode IC Method</a> Dong-Hwa Chung, Jin-Kook Lee, Jae-Sub Ko and Da-Eun Jeong	1135
TCI-10	<a href="#">MPPT Control of Photovoltaic System using Optimization Voltage with Temperature</a> Dong-Hwa Chung, Da-Eun Jeong, Jae-Sub Ko and Jin-Kook Lee	1139
TCI-11	<a href="#">System Modeling and Controller Design Using Time Series Data</a> Hyun Jin Ahn, Kwan Shik SHIM, youngcheol lim, Euisun Kim, Young Jin Ko, Kyung-Min Park, Il-Hyun Baek and Yun Sik Ro	1144
TCI-12	<a href="#">Reliability Management of Advanced Electrical Multiple Unit</a> Euijin JOUNG and Gildong KIM	1148
TCI-13	<a href="#">Commercialization and Popularization of Robotic Intelligent Components</a> Young-Ho Choi, Jung-Woo Lee, Sung-Jo Yun, Sung-Ho Hong, Jin-Ho Suh, Suk-Joong Kim and Jin-Ho Park	1152
TCI-14	<a href="#">ATP Functional Allocation for Korean Radio based Train Control System</a> Sehchan Oh, Yongki Yoon, Minsoo Kim and Yongkyu Kim	1157
TCI-15	<a href="#">Analysis on the Wireless Coverage to Operate Korea Radio based Train Control Systems</a> Kangmi Lee, Eun-Gyeong Chae, Gonyop Kim Kim, Yong-Su Song and Jae-ho Lee	1161
TCI-16	<a href="#">DC Motor Control using CDM based Two-Degree-of-Freedom Controller for Desired Tracking and Disturbance Rejection Characteristics</a> Don Isarakorn	1167
TCI-17	<a href="#">A Real-time Equipment Interface for Controlling Production Equipment</a> Seung Woo Lee, So Jeong Nam and Jei Kyung Lee	1173
TCI-18	<a href="#">Precise Welding Line Detection of a Hexahedron based on Twisted Motion of a Scanning LRF</a> Sungmin Lee and Jaebyung Park	1178
TCI-19	<a href="#">Identification of Flexible Mode and Motion Simulation for Beam Type Solar Cell Substrate Transport Robot</a> CheolHoon Park, Dong Il Park and TaeKwang Yoon	1181
TCI-20	<a href="#">Development of Ultra Lightweight Static Inverter for Electrical Multiple Unit</a> Jeong-Min Jo, Yong-Jae Han, Chang-Young Lee, Jin-Ho Lee and Hyun-Seung Jeong	1185
TCI-21	<a href="#">The Study of Train Power Energy Saver Control System on High Speed Tilting Train</a> Su-Gil Lee and Seong-Ho Han	1188
TCI-22	<a href="#">A Study of Propulsion System Operating Characteristics of Tilting Train</a> Su-Gil Lee	1194
TCI-23	<a href="#">Consensus Problem of Second-order Multi-agent Systems with Communication Channel Constraint on Signal Amplitude</a> MingHui Wang and Kenko Uchida	1198
TCI-24	<a href="#">Location Recognition for Elderly-Care Robot Services Using Received Signal Strength Indicator and Light Sensors</a> Sangseung Kang	1203

TCI-25	<a href="#">A study on the on-board centered train control system through ICT convergence</a> Hyunjeong Jo, Gonyop Kim, Jonghyen Baek, Kangmi Lee, Ducko Shin, Kyungho Shin and Jaeho Lee	1206
TCI-26	<a href="#">Analysis of Return Current for Rolling Stock Operation on Electrical Railroads</a> Jonghyen Baek, Yongkyu Kim, Sehchan Oh, Hyunjeong Jo and Kangmi Lee	1211
TCI-27	<a href="#">Modeling and real-time control of permanent magnet synchronous motor on cRIO</a> Libor Vesely and Lukas Pohl	1217
TCI-28	<a href="#">VCD: A Network Visualization Tool Based on Community Detection</a> Runpeng Liang, Jun Hua and Xiaofan Wang	1221
TCI-29	<a href="#">An Analytical Fault Detection Algorithm Using Euler Angles-Numerical and Practical Results</a> seiiid saeed nasrolahi, Hossein Bolandi and Mostafa Abedi	1227
TCI-30	<a href="#">The Study of the transient radiation effects on electronic devices caused by pulsed high energy gamma-ray</a> Oh Seungchan, Lee Namho and Heungho Lee	1233
TCI-31	<a href="#">Design of Train Integrity Monitoring System for Radio based Train Control System</a> Sehchan Oh, Yongki Yoon, Kyunghee Kim and Yongkyu Kim	1237
TCI-32	<a href="#">Analysis on the Effect of Beam Overlap of a Low Directivity Ultrasonic Sensor Ring</a> Hyunbin Kim and Sungbok Kim	1241
TCI-33	<a href="#">Implementation of Sensor-embedded Main Wing Model of Ultra Light Airplane for Health and Usage Monitoring System (HUMS) Test-bed</a> Jae-Hoon Song, Jae-Won Yang, Mi-Sun Rim and Ji-Hwan Kim	1247
TCI-34	<a href="#">Solving 2pi ambiguity problem of a laser scanner based on phase-shift measurement method for long distances measurement</a> Sungui Hwang, Junhwan Jang and Kyihwan Park	1250
TCI-35	<a href="#">A Method of Zero self-modification and Temperature Compensation for Indoor Air Quality Detection Based on a software Model</a> Cuiping Li, Jiuqiang Han, Qibin Huang, Xiaoqiang Dong, Xuequan Ding, yaming Ding, dianguo ZHANG and Ning Mu	1253
TCI-36	<a href="#">Detection of Bruise Damage of Pear Using Hyperspectral Imagery</a> Hong Quan Dang, Intaek Kim, Byoung-Kwan Cho and Moon S. Kim	1258
TCI-37	<a href="#">Design of Automatic Tension Control Device for a Vibrating Wire Sensor</a> Seok Jo Go, Keun Ho Rew, Jang Sik Park, Ki Ho Yu and Seung Hoon Lee	1261
TCI-38	<a href="#">KTX's Interior Noise Reduction Performance Comparison for Each Section using Multichannel Active Noise Control</a> HyeonSeok Jang, Young Min Kim, Jin-Do Chung and Kwon Soon Lee	1265
TCI-39	<a href="#">Person location estimation using an inertial sensor unit and wireless modules</a> Tran Duy Long and Young Soo Suh	1271
TCI-40	<a href="#">Defect detection of Aerial images without reference image</a> Sun Insun and Hong Jeong	1275

## FA01 : Artificial Intelligence

FA01-1	<a href="#">Statistical Performance of Conjugate Gradient Method for Wave-front Reconstruction in Adaptive Optics</a> Hiroki Sakaematsu and Yohei Saika	1279
FA01-2	<a href="#">Generalized MAP Estimation Via Parameter Scheduling and Maximizer of the Posterior Marginal Estimate For Image Reconstruction Using Multiple Halftone Images</a> Yohei Saika and Kenta Morimoto	1285
FA01-3	<a href="#">Reduction of ANFIS-Rules Based System through K-Map Minimization for Traffic Signal Controller</a> azura che soh and Yee Kean Koay	1290

FA01-4	<a href="#">Evaluation of Multimedia Distribution Systems in the Field of Foreign Language Acquisition</a> Yuichi Ono, Manabu Ishihara and Mitsuo Yamashiro	1296
--------	--	------

## FA02 : Robust Control

FA02-1	<a href="#">Further Improvement of Delay-Dependent Stability Criteria for Linear Systems with Time-Varying Delays</a> Won Il Lee, Changki Jeong and PooGyeon Park	1300
FA02-2	<a href="#">Set Invariance Approach to <math>H^\infty</math> Control for Input-Saturated Systems with Disturbances</a> Bum Yong Park, Sung Wook Yun and PooGyeon Park	1305
FA02-3	<a href="#">Robust and adaptive control of Euler-Lagrange systems with an attractor independent of uncertainties.</a> Nguyen Trung Quan	1309
FA02-4	<a href="#">Quantitative Measures of Output Noise Sensitivities of Linear Systems in Modal Domain</a> Haemin Lee and Youngjin Park	1313
FA02-5	<a href="#">Robust Control of Permanent Magnet Synchronous Motor</a> Petr Blaha and Pavel Vaclavek	1317
FA02-6	<a href="#">Gain Scheduling GMV using Gaussian Function for nonlinear hystretic structural systems</a> Lakhdar GUENFAF	1323

## FA03 : Linear/Nonlinear Control I

FA03-1	<a href="#">On the adaptation of the air-conditioner to the indoor environment using the Constant-Trace Algorithm</a> Ryo Yanagawa, Kenji Sawada and Seiichi Shin	1328
FA03-2	<a href="#">Observer Based Nonlinear Tension Control for Multi Motor Wire Winding System</a> Donghoon Shin, Wonhee Kim, Youngwoo Lee, Daehee Won and Chung Choo Chung	1333
FA03-3	<a href="#">An Unmanned Bicycle versus Linear Quadratic Optimal Controls</a> Krit Smerpitak, Prapart Ukakimaparn, Thanit Trisuwannawat and Sitthikorn Trakoonkootaworn	1337
FA03-4	<a href="#">Three-Axis Magnetic Attitude Control Algorithms for Small Satellites in the Presence of Noise</a> Jaime Rubio Hervas, Mahmut Reyhanoglu and Sergey Drakunov	1342
FA03-5	<a href="#">An Output Feedback Controller for Practical Distributed Coordinated Tracking of Double Integrators</a> Juhoon Back, Kun-hee Ryu and Seoung-wook Kim	1348
FA03-6	<a href="#">General Subtask Controller for Redundant Robot Manipulators</a> Omar Maarouf, Erkin Gezgin and Mehmet İsmet Can Dede	1352

## FA04 : [OS] Navigation Technology

FA04-1	<a href="#">Simultaneous State and Disturbance Estimation for Seeker System using Sliding Modes</a> Bhagyashri Tamhane, Shailaja Kurode, Prasad Parkhi and Dharmveer Singh	1358
FA04-2	<a href="#">Integration of Limited GNSS Signals with Monocular Vision based Navigation</a> sangkyung sung, Dae Hee Won, Sukchang Yun and Young Jae Lee	1364
FA04-3	<a href="#">An Indoor Positioning System for a First Responder in an Emergency Environment</a> Gong Bo Moon, Moon Beom Heo and Gyu-In Jee	1368
FA04-4	<a href="#">A design of synchronization method for TDOA-based positioning system</a> Seong Han Cho, Sang Rae Yeo, Heon Ho Choi, Chansik Park and Sang Jeong Lee	1373
FA04-5	<a href="#">Online Adaptive Optimal Tracking Control of Nonholonomic Mobile Robot</a> kai wang	1376
FA04-6	<a href="#">Fully Characterization of Strictly Positive Real Transfer Function Matrices</a>	1381



**FA05 : [OS] Control and Optimization of Energy Systems**

FA05-1	<a href="#">Optimal input design for sensitivity analysis of microalgal bioreactor systems</a> Sung Jin Yoo, Se-kyu Oh, Jong Min Lee and Shin Je Lee	1386
FA05-2	<a href="#">Iterative Learning Control of a Reactive Batch Distillation Process</a> Hyunsoo Ahn, Kwangsoon Lee, Mansuk Kim and Juhyun Lee	1390
FA05-3	<a href="#">Exergetic Analysis of Power and Freshwater Cogeneration systems</a> Iman Janghorban Esfahani and ChangKyo Yoo	1396
FA05-4	<a href="#">Energy Planning for a Residential Network of micro Combined Heat and Power Generators</a> Georgios Kopanos, Michael Georgiadis and Efstratios Pistikopoulos	1402
FA05-5	<a href="#">Dynamic Modeling and Control Studies for the Elevated Pressure Air Separation Unit in an IGCC Power Plant</a> Kosan Roh, Hyojin Lee and Jay. H Lee	1407
FA05-6	<a href="#">Active Disturbance Rejection Control For Circulating Fluidized Bed Boiler</a> Yuqiong Zhang, Donghai Li and Yali Xue	1413

**FA06 : Robot Mechanism and Control III**

FA06-1	<a href="#">A Method to Detect Object Grasping without Tactile Sensing on a Humanoid Robot</a> Junwon Jang, Kyungrock Kim, Kicheol Park, Hoseong Kwak and Kyungsik Roh	1419
FA06-2	<a href="#">Development of Electromagnet Brake Robot Finger for Highly Dexterous Motion through a Single Motor</a> Young June Shin, Ho Ju Lee, Keun-Ho Rew, Kyung-Soo Kim and Soohyun Kim	1423
FA06-3	<a href="#">Racket Control for Robot Playing Table Tennis Ball</a> Chunfang Liu, Yoshikazu Hayakawa and Akira Nakashima	1427
FA06-4	<a href="#">A Strategy for Connector Assembly using Impedance Control for Industrial Robots</a> HyunCheol Cho, Young-Loul Kim, Byeong-Sang Kim and Jae-Bok Song	1433
FA06-5	<a href="#">Discussion of Alternating Muscular Activity for the Design of an Automatic Saddle Positioning System</a> Tatsushi Tokuyasu and Shimpei Matsumoto	1436

**FA07 : [OS] Navigation, Guidance, and Control I**

FA07-1	<a href="#">Indoor 3D pedestrian tracking algorithm based on PDR using smartphone</a> Beomju Shin	1442
FA07-2	<a href="#">Omni-directional Image Matching for Homing Navigation Based on Optical Flow Algorithm</a> Youngseo Cha and DaeEun Kim	1446
FA07-3	<a href="#">An Efficient Localization Method using RFID Tag Floor Localization and Dead Reckoning</a> Jewon Lee, Youngsu Park, Daehyun Kim, Minho Choi, Taedong Goh and Sang woo Kim	1452
FA07-4	<a href="#">Visual Navigation using Pixel Intensity Information</a> Changmin Lee and DaeEun Kim	1457
FA07-5	<a href="#">Ceiling vision based SLAM approach using sensor fusion of sonar sensor and monocular camera</a> Sungjin Jo, Hyukdoo Choi and Euntai Kim	1461
FA07-6	<a href="#">CV-SLAM using Line and Point Features</a> Hyukdoo Choi, Sungjin Jo and Euntai Kim	1465

**FA08 : [OS] New Approaches and Methods for Human-Robot Interaction Design**

FA08-1	<a href="#">Assistive Control of a Surgical Robot Based on Bilateral Interacted Force Analysis</a> Ping-Lang Yen	1469
FA08-2	<a href="#">Receding Horizon Passive Control for a Walk-Assist Robot</a> Chun-Hsu Ko, Kuu-young Young and Sunil K. Agrawal	1474
FA08-3	<a href="#">[Invited Paper] User Identification Design by Fusion of Face Recognition and Speaker Recognition</a> Kai-Tai Song, Chao-Yu Lin, Yi-Wen Chen, Shuo-Cheng Chien, Sin-Horng Chen, Chen-Yu Chiang, Jyh-Her Yang, Yi-Chiao Wu and Tzu-Jui Liu	1480
FA08-4	<a href="#">Development of Direct Operation System for Mobile Robot by Using 3D CG Diorama</a> Kenta Kato, Noritaka Sato and Yoshifumi Morita	1486
FA08-5	<a href="#">Mechatronics Design of Multi-Finger Robot Hand</a> Chwan Hsen Chen	1491

## FA09 : Power Electronics

FA09-1	<a href="#">A Single Phase 9-Level Inverter Controlling Based On Phase Lock Loop Technique</a> Vittaya Tipsuwanporn, Arjin Numsomran and Kowit Phipek	1497
FA09-2	<a href="#">Improving the protective performance of the Gas turbine and HRSG Trip from Hydraulic Damper Closing in Power Plant</a> Prasit Phoosomma	1503
FA09-3	<a href="#">A Generalized Optimization in Cascade and Modular Multi-level Inverters by Harmony Search Method</a> Seyed Hossein Hosseini	1506
FA09-4	<a href="#">Multilevel Z-Source Inverter Based SVC Algorithm</a> Seyed Hossein Hosseini	1512
FA09-5	<a href="#">Robust Digital Control of a Broadband PWM Power Amplifier</a> Nobutaka Suzuki, Kohji Higuchi and Tatsuyoshi Kajikawa	1518
FA09-6	<a href="#">A New Switching charger for Photovoltaic Power System By Soft-Switching</a> Chamnan Ratsame	1522

## FA10 : Biomedical Signal Processing

FA10-1	<a href="#">Analysis of Gene Network in MCF-7 Human Breast Cancer Cells</a> Ryohei Shiraishi and Takashi Nakakuki	1527
FA10-2	<a href="#">Development of NIRS-BCI system Using Perceptron</a> Kazuki Yanagisawa, Hideyuki Sawai and Hitoshi Tsunashima	1531
FA10-3	<a href="#">A Neural Analysis on Motor Imagery and Passive Movement Using a Haptic Device</a> Hagil Kang, Laehyun Kim, Wanjoo Park, Jae-Hwan Kang, Gyu-Hyun Kwon and Sung-Phil Kim	1536
FA10-4	<a href="#">Frequency Response Analysis of Large-Scale Biological Systems</a> Takaaki Moriyama and Takashi Nakakuki	1542
FA10-5	<a href="#">Detection of Dermis and Fascia on Skin Layers for Liposuction Surgery Robot using Texture and Geometric Information</a> Sangha Song, Yo Kobayashi and Masakatsu G. Fujie	1546
FA10-6	<a href="#">A Novel, Robust Method of Measuring IMT(intima-media thickness) Using Graph Cut and Snake Model in Ultrasound Imaging</a> Jaeun Seo and DeukHee Lee	1552

## FB01 : [OS] Rehabilitation Mechatronics

FB01-1	<a href="#">Effect on Exercise Instrument of Horseback Riding indoor for Basic Fitness Evaluation</a>	1558
--------	---	------

	seung rok kang and Tae Kyu Kwon	
FB01-2	<a href="#">Effect on Improvement of Muscle Strength Unbalance according to Load Deviation Pattern in Upper Limbs</a>	1562
	seung rok kang and Tae Kyu Kwon	
FB01-3	<a href="#">Evaluation of Simplified Repeated Resistance Training System for Severe Hemiplegic Stroke Patient</a>	1566
	Michito Yasukita, Yuki Iida, Kazunori Yamazaki, Noritaka Sato, Yoshifumi Morita, Hiroyuki Ukai, Yoshiaki Takagi, Yoshitaka Aoki, Hirofumi Tanabe and Rumi Tanemura	
FB01-4	<a href="#">Development of Anti-Gravity Control Model for Robot Gait Training System</a>	1570
	SungJae Kang, Hyunseok Cho, Seongyun Jung, GyoSeok Kim, JeiCheong Ryu and MunSeong Mun	
FB01-5	<a href="#">Development of Knee Joint Robot for Students Becoming Therapists</a>	1573
	Yoshie Maeda, Tatsuya Hirano, Noritaka Sato, Yoshifumi Morita, Hiroyuki Ukai, Kouji Sanaka, Keiko Takao and Ayako Satonaka	
FB01-6	<a href="#">Design and Control of an Exoskeleton Device for Active Wrist Rehabilitation</a>	1577
	Inhyuk Moon and Ju-hwan Bae	

## FB02 : PID Control

FB02-1	<a href="#">Synthesis of PD-type Anti-windup Compensators for LTI Systems with Asymmetric Input Saturation</a>	1581
	Yoshitaka Matsuda, Toshiki Haraguchi, Satoru Goto and Takenao Sugi	
FB02-2	<a href="#">Discrete-Time PIDA Controller Designed by Kitti's Method with Bilinear Transform</a>	1585
	Prapaisri La-orsri, Krit Smerpitak, Prapart Ukakimaparn and Thanit Trisuwannawat	
FB02-3	<a href="#">Bilinear Discrete PID<math>\times</math>(n-2) stage PD Cascade Controller for SISO Systems</a>	1591
	Krit Smerpitak, Prapart Ukakimaparn, Thanit Trisuwannawat and Prera Lavanprakai	
FB02-4	<a href="#">PID controller with feedforward low pass filters for permanent magnet stepper motors</a>	1597
	Youngwoo Lee, Donghoon Shin, Wonhee Kim and Chungchoo Chung	
FB02-5	<a href="#">DISCRETE TIME ROBUST INTEGRAL SERVO WITH PID <math>\times</math> (n-2)/2 STAGE PDA CONTROLLERS FOR UNSTABLE SYSTEMS</a>	1601
	Prachaya Achariyapagon, Pittaya Pannil and Thanit Trisuwannawat	
FB02-6	<a href="#">Proportional-Derivative (PD) controllers for Haptics subject to Distributed Time-Delays: A Geometrical Approach</a>	1605
	Bogdan Liacu, Irinel-Constantin Morarescu, Silviu-Iulian Niculescu, Claude Andriot, Didier Dumur, Patrick Boucher and Frederic Colledani	

## FB03 : Linear/Nonlinear Control II

FB03-1	<a href="#">A Design of H<math>\infty</math> Model-matching Multivariable Controller by Spectral Analysis using Model-free Controller Tuning</a>	1611
	Masataka Ishizaki, Kazuhiro Yubai and Junji Hirai	
FB03-2	<a href="#">Boundary control of marine risers with bending couplings</a>	1615
	Tung Lam Nguyen, Khac Duc Do and Jie Pan	
FB03-3	<a href="#">Control of a Spacecraft with Time-Varying Propellant Slosh Parameters</a>	1621
	Jaime Rubio Hervas and Mahmut Reyhanoglu	
FB03-4	<a href="#">Orbital and Attitude Control of a Spacecraft Around an Asteroid</a>	1627
	Mahmut Reyhanoglu, Niloofar Kamran and Takahiro Kuhara	
FB03-5	<a href="#">A Method of the Diagnosis through Descriptor Model of a Constrained Dynamic Motion of a Robot Gripper by the Indirect Measurement</a>	1633
	rai wung park and rai wung park	
FB03-6	<a href="#">Silk dryer oven for a community with close-loop control</a>	1639
	nitipong somchaiwong and Wirot Ponglangka	

## **FB04 : [OS] Special Environmnet Localization and Navigation**

- FB04-1 [Development of Autonomous Vehicle Control Algorithm Based on DGPS\(RTK\) and Test Vehicle Performance Verification](#) 1644  
Young-Geun Moon, Moon-sik Kim and Min-cheol Lee
- FB04-2 [Accurate Velocity Control based on the distance of a Mobile Robot and Obstacle using a Haptic Joystick](#) 1649  
Dong Hyuk Lee, Kyung Wook Noh, Sook Hee Park and JangMyung Lee
- FB04-3 [Performance Improvement and Height Estimation of Pedestrian Dead-Reckoning System using a Low Cost MEMS Sensor](#) 1655  
Yun-Ki Kim, Seung-hwan Choi, Hyun-Woo Kim and Jang-Myung Lee
- FB04-4 [Abrasion Diagnosis and Assessment of Marine engine Using the Wavelet Transform](#) 1661  
Hyunseop Lim, Jia-Jun Liu, Jong-ho Han and Jangmyung Lee
- FB04-5 [Path-Tracking Control of a Laser Guided Vehicle using Fuzzy Inference System](#) 1666  
Hajun Song, Jungmin Kim, EunKook Jung, Junha Lee and Sungsin Kim
- FB04-6 [Improvement of Travel Distance at the Outdoor Environment by using IMU and Encoder](#) 1669  
Kyoung-hwan Kim, Beom-seok Seo, Gun-woo Jeong and Jang-myung Lee

## **FB05 : [OS] Measurement, Control and Systems in the Steel Industry**

- FB05-1 [Modeling of DC Electric Arc Furnace Using Chaos Theory and Neural Network](#) 1675  
Kyu-hwan Kim, Jae Jin Jung, Sang Jun Lee, Seokbae Moon and Sang Woo Kim
- FB05-2 [Development of The Real Time Hardware-in-the-Loop Simulator for 5 Stand Cold Rolling Mill](#) 1679  
Young-il Kang, Sung-Hoon Choi, Gyoo-taek Lee and Sang-Chul Won
- FB05-3 [Automated Surface Inspection System for Black Resin Coated Steel](#) 1683  
ChangHyun Park, HoMoon Bae, JongPil Yun and SungWook Yun
- FB05-4 [Application S/W re-engineering approach in the steel plant to improve productivity efficiently](#) 1686  
Youngbok Park, Jinseok Yang, Jinhee Lee and Kyyoung Shin
- FB05-5 [Measurement of Mechanical Properties of High Strength Steel Sheets using Laser-Based ultrasonics](#) 1691  
Choongsoo Lim and Hyeongjun Huh

## **FB06 : Bio-Systems and Control I**

- FB06-1 [A Synthesis Method of Gene Regulatory Networks Having Cyclic Expression Pattern Sequences and Its Evaluation](#) 1694  
Yoshihiro Mori and Yasuaki Kuroe
- FB06-2 [Nano carriers based targeted drug delivery path planning using hybrid particle swarm optimizer and artificial magnetic fields](#) 1700  
Syed Hassan and Jungwon Yoon
- FB06-3 [Hemodynamic Study for New Stent Design with Mesh-Typed Stents in a Cerebral Aneurysm Model using PIV](#) 1706  
CHANG-HO YU, MAKOTO OHTA and TAE-KYU KWON
- FB06-4 [Biologically Inspired Grasp Primitives for a Dexterous Robotic Hand to Catch and Lift a Sphere](#) 1710  
John Lavery, Ben Kent and Erik Engeberg
- FB06-5 [Image-based Force Estimation of Deformable Tissue using Depth Map for Single-Port Surgical Robot](#) 1716  
Seong Young Ko, Wooyoung Kim, Sungmin Seung, Hongseok Choi, Sukho Park and Jong-Oh Park
- FB06-6 [Design of Robotic Surgical Instrument for Minimally Invasive Surgical Robot System](#) 1720

## FB07 : [OS] Navigation, Guidance, and Control II

FB07-1	<a href="#">A Terrain Referenced Precision Approach based on LiDAR for Lunar Landing</a> Wonhee Lee, Young Min Yoo, Sun Min Lee and Chan Gook Park	1724
FB07-2	<a href="#">Vision-only UAV Navigation Aided by Terrain Elevation Map</a> Yeongju Kim, Dongjin Lee and Hyochoong Bang	1729
FB07-3	<a href="#">Integration of Terrain Rerenced Navigation System with INS using Kalman Filter</a> Dongjin Lee, Hyochoong Bang and Cheonjoong Kim	1734
FB07-4	<a href="#">Flight Test of Flight Control Performance for Airplane Mode of Smart UAV</a> Youngshin Kang, Bumjin Park, Am Cho, Changsun Yoo and Samok Koo	1738
FB07-5	<a href="#">Design of Self-Tuning Gain Depth Controller for an Autonomous Underwater Vehicle with Mass Shifter Mechanism</a> Hyeungsik Choi	1742
FB07-6	<a href="#">Design of Hovering Underwater Robotic Platform to Capture Harmful Marine Organisms</a> TaeWon Seo, Jin Sangrok, Seokwoo Lee, Jihoon Kim and Jongwon Kim	1747

## FB08 : [OS] Medical Robotics and Simulation

FB08-1	<a href="#">Combined Kinematic Analysis of a Hybrid 7-DOF Rehabilitation Robot</a> Hyun Soo Woo and Ohwon Kwon	1752
FB08-2	<a href="#">Multi-criteria Optimization of the 4 Links of an 8 DOF Haptic Master Device for a Surgical Robot</a> Seung Gyu Kang, Hashim Iqbal and Doo Yong Lee	1756
FB08-3	<a href="#">H<math>\infty</math> Control of Bilateral Telesurgical Systems with Communication Constraints</a> Ayoung Hong, Jang Ho Cho and Doo Yong Lee	1762
FB08-4	<a href="#">Affective Classification Using Bayesian Classifier and Supervised Learning</a> Seong Youb Chung and Hyun Joong Yoon	1768
FB08-5	<a href="#">Effects of Imperfect Communication Network on Haptic Teleoperator's Performance</a> Hyoung Il Son, Ayoung Hong, Heinrich H. Buelthoff and Dongjun Lee	1772

## FB09 : Power Systems

FB09-1	<a href="#">Building Power Management for Energy Saving: A Case Study of University Building</a> Amphawan Julsereewong, Prasit Julsereewong and Satit Mangkalajan	1778
FB09-2	<a href="#">Model Predictive Control in Dynamic Economic Dispatch for Improving Grid Reliability</a> Chung Hun Kim, Yonghao Gui, Young Ok Lee and Chung Choo Chung	1783
FB09-3	<a href="#">Torque Control Methods for Wind Turbines and Their Responses</a> Chae Wook Lim	1788
FB09-4	<a href="#">Novel Unit Commitment Approach for Wind Farm</a> Yonghao Gui, Chung Hun Kim, Young Ok Lee and Chung Choo Chung	1791
FB09-5	<a href="#">Model Based PID Control Design for Bus Voltage Regulation in Multi-Machine Power Systems</a> Seok-Kyoon Kim, Young Il Lee, Hwachang Song and Jung-Su Kim	1796
FB09-6	<a href="#">Comparison of Power Quality and Luminous Efficacy of Commercial Energy Saving Lamps in Thailand</a> nitipong somchaiwong, Ekkachai Chaidee and Prasan Ruchirasak	1800

## FB10 : [OS] Medical Imaging

FB10-1	<a href="#">Temporal Subtraction Method for Abdominal Contrast and Non-contrast Image Based on Image Matching Techniques</a>	1805
	Masashi Minashima, Syouhei Ogihara, Hyoungseop KIM, Joo Kooi TAN, Seiji ISHIKAWA, Seiichi MURAKAMI and Takatoshi AOKI	
FB10-2	<a href="#">A Temporal Subtraction Method for Thoracic CT Images Using Non Rigid Warping Technique</a>	1809
	Takumi Tokisa, Hyoungseop Kim, Joo Kooi Tan, Seiji Ishikawa, Young Lae Moon, Sung Ho Yoon and Wontae Kim	
FB10-3	<a href="#">Classification of Lung Nodules on Temporal Subtraction Image Based on Statistical Features and Improvement of Segmentation Accuracy</a>	1814
	Takahiro Miyajima, Takumi Tokisa, Shinya MAEDA, Hyoungseop Kim, Joo Kooi TAN, Seiji ISHIKAWA, Seiichi MURAKAMI and Takatoshi AOKI	
FB10-4	<a href="#">Detection of Bone Regions on Legs from CTA Image Using Concentration Gradients</a>	1818
	Kodai Wada, Akiyoshi Yamamoto, Hyoungseop Kim, Joo Kooi TAN and Seiji ISHIKAWA	

## FC02 : Control Theory

FC02-1	<a href="#">A Continuous Canonical Form for Static Output Feedback in Linear System</a>	1822
	Ho-Chan Kim and Sin Kim	
FC02-2	<a href="#">Robust Stabilization of Approximately Feedback Linearizable Time-varying Systems with Uncertainties Using Singular Perturbation</a>	1828
	Young-Jun Cho, Kyungin Kang, Min-Sung Koo and Jong-Tae Lim	
FC02-3	<a href="#">Stability analysis of standard and non-standard nonlinear singularly perturbed system with uncertainty</a>	1833
	Kyun-Sang Park, Hyun-Wook Jo and Jong-Tae Lim	
FC02-4	<a href="#">Analysis of input-output characteristics of boundary value linear systems</a>	1838
	Yoshiki Kagitani, Naoyuki Hara and Keiji Konishi	
FC02-5	<a href="#">Damping Characteristics of the K-Polynomial</a>	1842
	Young Chol Kim and Jinghua Wu	
FC02-6	<a href="#">Observer Design for a Class of Nonlinear Delayed Systems with Unknown Inputs and Markovian Jump Parameters</a>	1848
	Amir H. Abolmasoumi and Saleh S. Delshad	

## FC03 : [OS] Assistive, Rehabilitative and Medical System

FC03-1	<a href="#">Force Transmission in Joint-less Tendon Driven Wearable Robotic Hand</a>	1853
	Brian Byunghyun Kang, HyunKi In and Kyujin Cho	
FC03-2	<a href="#">A Novel Registration Method for Total Knee Arthroplasty Using a Patient-Specific Registration Guide</a>	1859
	Taeho Jang and Kunwoo Lee	
FC03-3	<a href="#">Development of Actuation System for Wearable Robots using Spiral Spring</a>	1863
	Yongtae Kim, Changyong Song and Jaeheung Park	
FC03-4	<a href="#">Application of EEG for Multimodal Human-Machine Interface</a>	1869
	Jangwoo Park, Il Woo and Shinsuk Park	
FC03-5	<a href="#">Power-Assisted Wheelchair with Gravity Compensation</a>	1874
	Soon-Wook Hwang, Chang-Hyuk Lee and Young-bong Bang	

## FC04 : [OS] ROBOTICS

FC04-1	<a href="#">An Intelligent Control of Mobile Robot Based on Voice Command</a>	1878
	Sung Hyun Han, Sung-Won Jung, Jong-Baem Won, Won-Jong Hwang and Chang-Jae Cho	

FC04-2	<a href="#">A Real-Time Implementation of Walking Control for Humanoid Robot</a>	1882
	Sung Hyun Han, Ki-Won Sung, In-Man Park, Min-Sung Kim and Le Xuan Thu	
FC04-3	<a href="#">A Study on Visual Servoing Control of Industrial Robot</a>	1886
	Sung Hyun Han, Woo-Song Lee, Jae-Hong Eom, Jong-Dae Won and Nguyen Huu Cong	
FC04-4	<a href="#">A Robust Grasping Control of Robot Hand with Four Fingers</a>	1891
	Sung Hyun Han, Yoo Ki Cho, Eok-Gon Kim, Young-Ho Ha and Nguyen Huu Cong	
FC04-5	<a href="#">A Study on Real-Time Implementation of Obstacle Avoidance for Autonomous Travelling Robot</a>	1896
	Sung Hyun Han, Byoung Kyun Shim, Won-Jun Hwang, Kyung-Sun Choi and Le Xuan Thu	

## FC05 : [OS] Control and Sensing System Application to Ocean Vehicle

FC05-1	<a href="#">Nonlinear Observer and Sliding Mode Control Design for Dynamic Positioning of a Surface Vessel</a>	1900
	Bui Van Phuoc, Sang Won Ji, Kwang Hwan Choi and Young Bok KIM	
FC05-2	<a href="#">The <math>H^\infty</math> Controller Design Including Control Allocation for Marine Vessel</a>	1905
	Sangwon JI, YoungBok KIM, JiHyun Jeong and JiSeong JANG	
FC05-3	<a href="#">Improvement of Template Matching for Distance Measurement System Based on Image Sensors</a>	1908
	akio kita, yoshinobu hagiwara, yongwoon choi and Kazuhiro Watanabe	
FC05-4	<a href="#">Development of a learning support system with PaPeRo</a>	1912
	Nozomi Fujiwara, Yoshinobu Hagiwara and Yongwoon Choi	
FC05-5	<a href="#">Indoor Human Navigation System on Smartphones using View-Based Navigation</a>	1916
	Mitsuaki Nozawa, Yoshinobu Hagiwara and Yongwoon Choi	
FC05-6	<a href="#">Analysis of Motion Response of Barge Ships in Regular Waves</a>	1920
	Lee Seung Chul, Kim Young Bok and Goo Ja Sam	

## FC06 : Bio-Systems and Control II

FC06-1	<a href="#">Biomimetic Swimming Mini-Robots Using Electro-Magnetic Actuation (EMA) System</a>	1923
	Sukho Park, Hyunuchul Choi, Semi Jeong, Cheong Lee, Youngho Ko, Seong Young Ko and Jong-Oh Park	
FC06-2	<a href="#">Adaptive Synergy Control for a Dexterous Artificial Hand Based on Grasped Object Orientation</a>	1927
	Nareen Karnati, Benjamin A. Kent and Erik Engeberg	
FC06-3	<a href="#">Direction of Slip Detection For A Biomimetic Tactile Sensor</a>	1933
	Erik Engeberg, Morteza Vatani and Jae-Won Choi	
FC06-4	<a href="#">Simple Structured Tactile Sensor for Tissue Recognition in Minimal Invasion Surgery</a>	1938
	Joon Ho Kwon, Daehie Hong and Jung-Hoon Hwang	
FC06-5	<a href="#">Arm exoskeleton rehabilitation robot with assistive system for patient after stroke</a>	1943
	Guan-De Lee, Wei-Wen Wang, Kai-Wen Lee, Sheng-Yen Lin, Li-Chen Fu, Jin-Shin Lai, Wen-Shiang Chen and Jer-Junn Luh	
FC06-6	<a href="#">Distributed Series Elastic Actuator: analysis and simulations</a>	1949
	Hamed Ali Yaghini Bonabi, Majid Nili Ahmadabadi and Fariba Bahrami	

## FC07 : Navigation, Guidance, and Control III

FC07-1	<a href="#">Optimal Geometric Allocation of Ground Stations for Navigation Satellites</a>	1955
	Young Hoon Kim, Jin Young Suk, Young-Rock Kim, Sang-Young Park, Myeong-Jong Yu and Young-Bum Park	
FC07-2	<a href="#">A Hybrid Differentiator for Strapdown Guidance System</a>	1960
	Jun-fang Fan, Zhong SU, Qing LI and Jiang WANG	
FC07-3	<a href="#">Development of driving support system for electric vehicle by using image processing technology</a>	1965

YUXIANG SUN, NAN WU, Shigeyuki TATENO and Harutoshi OGAI

- FC07-4 [Low-Thrust Guidance Scheme for the Spacecraft using B-plane Targeting and Lyapunov Feedback control](#) 1969  
Dong-Hyun Cho and Hyochoong Bang
- FC07-5 [Model Predictive Planning and Control of Rotary-wing Unmanned Aerial Vehicle](#) 1974  
Kwangjin Yang and Salah Sukkarieh
- FC07-6 [An Improved Method to Integrate Low-Cost Sensors for the Navigation of Small UAVs](#) 1980  
fei liu

## FC08 : [OS] Tele-Robot System

- FC08-1 [Remote Variable Access Protocol for Data-Centric TeleRobotics](#) 1985  
Jeong Seok Kang, Jong Whan Kim and Hong Seong Park
- FC08-2 [Field of View Deficiency-based Dominance Distribution for Collaborative Teleoperation](#) 1990  
Boris Gromov, Galina Ivanova and Jee-Hwan Ryu
- FC08-3 [Development of a Master Station for Remote Control of Rescue Robots](#) 1994  
Jae-Hee Kim, Jae-Cheol Lee and You-Rack Choi
- FC08-4 [3D-based Visual Assistance System for Tele-operation](#) 1998  
Ga-Ram Jang, Moon-Hong Baeg, Yong-Deuk Shin, Jae-Shik Yoon, Ji-Hun Bae and Jae-Han Park
- FC08-5 [An improved speed ratio control](#) 2001  
Soohee Han, Kwangsik Woo, Dooam Lee, Donguen Jung and Sanghun Oh
- FC08-6 [Implementation of a Work Distribution Function for Tele-operation under Multi-User and Multi-Robot Environments](#) 2004  
Joomin Kim, Sekwon Oh and Daewon Kim

## FC09 : Robotic Applications

- FC09-1 [Slope Driving Experiment of Front Drive Type Electric Wheelchair with Casters using Yaw-rate Compensation](#) 2008  
Aydin Tarik Zengin, Yutaro Maruno, Hiroshi Okajima and Nobutomo Matsunaga
- FC09-2 [Development of Lane Estimator using the Vehicle's Kinematic Motion](#) 2014  
Youngseop Son, Young Ok Lee, Chung Choo Chung and Seung-Hi Lee
- FC09-3 [Master-slave mapping and slave base placement optimization for intuitive and kinematically robust direct teleoperation](#) 2017  
Joao Rebelo and Andre Schiele
- FC09-4 [Sensorless Torque Control of Humanoid Arm having Highly Back-drivable Joints](#) 2023  
KyungWon Moon, Youngbo Shim, Yong-Jae Kim, Dong-Hun Lee, JongDo Choi, YoonSoo Kim and Kyungsik Roh
- FC09-5 [A Three Degree of Freedom Force/Torque Sensor to Measure Foot Forces](#) 2028  
CHAO YUAN and Changsoo Han
- FC09-6 [Design of an Intelligent Duct Cleaning Robot with Force Compliant Brush](#) 2033  
Seung Woo Jeon, Wootae Jeong, Duckshin Park and Soon-Bark Kwon

## FC10 : [OS] Recent Advances in Brain Engineering

- FC10-1 [Investigation of cortical activation patterns in response to the inter-digit vibrotactile stimulation](#) 2038  
Sung-Phil Kim, Yoon Gi Chung, Junsuk Kim, Hyung-Sik Kim, Soon-Cheol Chung and Jang-Yeon Park
- FC10-2 [Imaging of Functional Network Properties in Intractable Epilepsy Based on Neural Signal Analysis](#) 2042  
Chang-Hwan Im



FC10-3	<a href="#">Analysis of fNIRS Data in the Prefrontal Cortex by Blind Separation into Independent Components</a>	2046
	Keum-Shik Hong, Hendrik Santosa and Xiaosu Hu	
FC10-4	<a href="#">FNIRS based functional connectivity during task state and resting state</a>	2049
	Keum-Shik Hong, Xiaosu Hu and Shuzhi Ge	
FC10-5	<a href="#">Feasibility of hybrid BCI using ERD- and SSSEP- BCI</a>	2053
	Sung-Chan Jun and Sangtae Ahn	

## FDI : Interactive Session II

FDI-1	<a href="#">Global Set Point Robust Regulation for a PVTOL Vehicle With Bounded Inputs</a>	2057
	Obregón-Pulido Guillermo, Meda-Campaña J. A, Solis-Perales Gualberto and Castillo-Toledo B.	
FDI-2	<a href="#">Semi-autonomous Navigation of an Unmanned Ground Vehicle for Bird Expellant in an Airport</a>	2063
	Chang-hoi Kim, Tae-won Jeong and Kyung-Min Jeong	
FDI-3	<a href="#">Object and ground classification for a mobile robot in urban environment</a>	2068
	Jeong Hyo Ha, Sijong Kim and Myung Jin Chung	
FDI-4	<a href="#">Design of T-S Fuzzy-Model-Based Diving Control of Autonomous Underwater Vehicles : Line of Sight Guidance Approach</a>	2071
	Sung Woo Jun, Do Wan Kim and Ho Jae Lee	
FDI-5	<a href="#">Combinatorial Optimization Using FOA and GA in Futures Market Technical Analysis</a>	2074
	yuwen zhang and Chen Fang	
FDI-6	<a href="#">Design Analysis of Precision Navigation System</a>	2079
	Seongkyun Jeong, Taehee Kim, Jae-Eun Lee, Sanguk Lee and Jiyun Lee	
FDI-7	<a href="#">Analysis of Effect of Spoofing Signal in GPS Receiver</a>	2083
	Tae-Hee Kim, Cheon Sig Sin and Sanguk Lee	
FDI-8	<a href="#">Modeling and Simulation of a Launch Vehicle Thrust Vector Control System</a>	2088
	Choong-Seok Oh	
FDI-9	<a href="#">Improved Accelerometer and Magnetometer-Based Solution to Solve Quaternion</a>	2093
	Feng Zhou and Yanxuan Wu	
FDI-10	<a href="#">E1 Signal Processing of Galileo IOV-1 PFM Satellite</a>	2097
	Inone Joo and Sanguk Lee	
FDI-11	<a href="#">Accurate Calibration Method for SDINS Incorporating Earth-Rate Injection Technique</a>	2100
	Kyung-Jun Han, Byung-Su Park, Sang-Woo Lee and Myeong-Jong Yu	
FDI-12	<a href="#">Real Time Inspection Method for Laser Welding Process</a>	2106
	Hee Shin Kang, Ji Whan Noh and Kyung Han Kim	
FDI-13	<a href="#">The Assessment of Remote Accessibility for Processing Equipment Using the Graphic Simulator</a>	2110
	Sung-Hyun Kim	
FDI-14	<a href="#">Study on the Requirements of Joint Torque Sensors considering Mechanical Condition of the Joint Mechanism of a manipulator</a>	2114
	Chanhun Park	
FDI-15	<a href="#">Analysis of large range rotational flexure in precision 6-DOF tripod robot</a>	2117
	Dongwoo Kang and Daegab Gweon	
FDI-16	<a href="#">Handling Gripper Using Multi Links Mechanism</a>	2121
	Kyoung Taik Park, Doo Hyung Kim and Hanme Kim	
FDI-17	<a href="#">Design and Modeling of an Image Stabilizing Device for Small Unmanned Ground Vehicle</a>	2125
	Dooyeol Koh, Soohyun Kim and Kyungsoo Kim	
FDI-18	<a href="#">Vibration simulation of hybrid type substrate handling robot in the vacuum environment</a>	2131
	DONG IL PARK, Cheolhoon Park and Yijun Yoo	
FDI-19	<a href="#">Assembly phase estimation in the square peg assembly process</a>	2135

	DONG IL PARK, Chanhun Park, Hyunmin Do, Taeyong Choi and Jin-Ho Kyung	
FDI-20	<a href="#">Design and Control of High-Speed Parallel Robot</a> Hyun Min Do, Chan Hun Park, Byung In Kim, Gwang Jo Chung and Jin Ho Kyung	2139
FDI-21	<a href="#">Motion Analysis of Lizard Locomotion Using Motion Capture</a> Chang-hoi Kim, Ho-Cheol Shin and Tae-won Jeong	2143
FDI-22	<a href="#">Simple and Complex Obstacle Detection Using an Overlapped Ultrasonic Sensor Ring</a> Hyunbin Kim and Sungbok Kim	2148
FDI-23	<a href="#">Adaptive Sliding Window for Hierarchical Pose-Graph-Based SLAM</a> Seungwook Lim, Tae-kyeong Lee, Seongsoo Lee, Shounan An and Se-young Oh	2153
FDI-24	<a href="#">Sliding Mode Control for a Two-Wheeled Inverted Pendulum Mobile Robot Driving on Uniform Slopes</a> Dong Sang Yoo, Min-Sun Key and Chang-Gook Jeon	2159
FDI-25	<a href="#">Occlusion Filling in Dynamic Programming with Simple Index Treatment</a> JeongMok HA and Hong JEONG	2163
FDI-26	<a href="#">Face Recognition by Weighted Multi-resolution Uniform Local Gabor Binary Patterns</a> Kyung Joong Jeong and Dai Jin Kim	2167
FDI-27	<a href="#">Vision-based metric topological SLAM</a> Jihong Min, Jungho Kim, In So Kweon and Yong Woon Park	2171
FDI-28	<a href="#">Online 3D World Reconstruction with Independently Moving Point Detection Using Stereo Vision</a> Jungwon Kang, Bo Gil Seo and Myung Jin Chung	2177
FDI-29	<a href="#">Monocular Vision based Independently Moving Feature Detection using Image Correspondences</a> Sijong Kim, Jungwon Kang and Myung Jin Chung	2181
FDI-30	<a href="#">A Night Firing System by One Camera Equipped Convex Mirror for Monitoring Tracer Bullet to Teach Exercises</a> In Jeong Lee	2185
FDI-31	<a href="#">Design of a Joint Actuation Module for External Force Detection</a> Chanhun Park	2189
FDI-32	<a href="#">Study on the User Interface for a Dual Arm Robot Manipulator</a> Chanhun Park	2192
FDI-33	<a href="#">Endoscopic Vision Based Tracking of Multiple Surgical Instruments in Robot-assisted Surgery</a> Jaesoon Choi	2195
FDI-34	<a href="#">DSP-based motion control of master-slave manipulator system developed for use in pyroprocess research facility</a> Jong Kwang Lee, Byung Suk Park, Kiho Kim and Il-Je Cho	2199
FDI-35	<a href="#">PRIDE remote handling systems</a> KIHO KIM, Jongkwang Lee, Byungsuk Park and Ilje Cho	2203
FDI-36	<a href="#">Advanced Manufacturing with Robot</a> Taeyong Choi, Hyunmin Do, Chanhun Park, Kwangcho Chung, Dongil Park and Jinho Kyung	2207
FDI-37	<a href="#">Augmented Reality Based Teaching Pendant for Industrial Robots</a> syed mohsin abbas, syed hassan and Jungwon Yoon	2210
FDI-38	<a href="#">A Predictive Collision-Free Fuzzy Algorithm for Mobile Robots to Avoid Obstacles Moving at Variable Speeds</a> Jin-Woo Jung and Hoang Minh Do	2214
FDI-39	<a href="#">A Proposal of User Friendly Alive Human Detection Robot to Tackle Crisis Situation</a> shuddha Chowdhury and Mahmud Rafiq	2218
FDI-40	<a href="#">Optimization of Driver Selection for Minimizing Cost on LNG Plant Considering Risk Factor</a> Inkyu Lee, Kyungjae Tak, Wonsub Lim, Kwang-ho Choi and Moon Il	2222