

# **2018 SICE International Symposium on Control Systems (SICE ISCS 2018)**

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## Day 1: Friday March 9, 2018

### Multi-Agent and Networked Control Systems

Chair: Kiyotsugu Takaba (Ritsumeikan University, Japan)

9:00-10:40, Room 1

Schedule	No.	Title	Authors
9:00-9:20	48	A Group Control of the Movable Antennas for Maximizing Received Signal Level in the Radar Surveillance System...1	Yasuo Fujishima (Nagoya University, Japan), Shun-ichi Azuma (Nagoya University, Japan)
9:20-9:40	63	Synchronization by Modified Broadcast Gossip Algorithm in Multi-Agent System...6	Jeonggi Yang (Pohang University of Science and Technology, Republic of Korea), Hyoung woong Lee (Pohang University of Science and Technology, Republic of Korea), Soohye Han (Pohang University of Science and Technology, Republic of Korea)
9:40-10:00	55	Two Variations of Passivity-Short-Based Semi-autonomous Robotic Swarms...12	Made Widhi Surya Atman (Tokyo Institute of Technology, Japan), Julian Hay (University of Stuttgart, Germany), Junya Yamauchi (Tokyo Institute of Technology, Japan), Takeshi Hatanaka (Tokyo Institute of Technology, Japan), Masayuki Fujita (Tokyo Institute of Technology, Japan)
10:00-10:20	10	Stability Analysis of Networked Control Systems with Uncertain Packet-loss Probability...20	Lanlan Su (The University of Hong Kong, Hong Kong S.A.R.), Graziano Chesi (The University of Hong Kong, Hong Kong S.A.R.)
10:20-10:40	71	Wireless Networked Control Systems Subject to Jamming and Disturbance...N/A	Ahmet Cetinkaya (Tokyo Institute of Technology, Japan), Hideaki Ishii (Tokyo Institute of Technology, Japan), Tomohisa Hayakawa (Tokyo Institute of Technology, Japan)

### Mechanical Systems Control

Chair: Mitsuji Sampei (Tokyo Institute of Technology, Japan)

9:20-10:40, Room 2

Schedule	No.	Title	Authors
9:20-9:40	74	Precision Fuzzy Sliding-Mode Tracking Control with DNLRX Model Based Friction Feed-Forward Compensator...27	Jing-chung Shen (National Formosa University, Taiwan), Chia-Suo Ye (National Formosa University, Taiwan)
9:40-10:00	47	Boundary Control of a Thin Rectangular Plate with Clamped-Clamped-Clamped-Free Boundary Conditions...33	Toshimi Shimizu (Ibaraki University, Japan)

10:00-10:20	73	3D Point Cloud Matching and Principal Curvature-Based Defect Detection for Grinding Machine Control...N/A	Wen-Chung Chang (National Taipei University of Technology, Taiwan), Sheng-Chieh Lin (National Taipei University of Technology, Taiwan), Chia-Hung Wu (National Taipei University of Technology, Taiwan), Ya-Hui Tsai (Industrial Technology Research Institute, Taiwan), Wei-Yao Chiu (Industrial Technology Research Institute, Taiwan)
10:20-10:40	77	Optimized Fractional Order Controller for a Fractional Order Spherical Tank System Using Grey Wolf Optimizer...N/A	Santosh Kumar Verma (Indian Institute of Technology (BHU), India), Shyam Krishna Nagar (Indian Institute of Technology (BHU), India)

### ISCS Invited Talk

Chair: Masaaki Kanno (Niigata University, Japan)

11:00-11:40, Room 1

**Graziano Chesi** (The University of Hong Kong, Hong Kong S.A.R.)

**Title: Homogeneous Rational Lyapunov Functions for Performance Analysis of Switched Systems**

### Recent Advances in LMI Method for Control

Chair: Masaaki Kanno (Niigata University, Japan)

11:40-12:40, Room 1

Schedule	No.	Title	Authors
11:40-12:00	41	H2 State-Feedback Synthesis for Discrete-Time Systems under Positivity Constraint...39	Yoshio Ebihara (Kyoto Univ., Japan), Patrizio Colaneri (Politecnico di Milano, Italy), Jose C. Geromel (UNICAMP, Brazil)
12:00-12:20	80	Strong Feasibility of the Dual Problem of Linear Matrix Inequality for H-Infinity Output Feedback Control Problem...47	Hayato Waki (Kyushu University, Japan), Noboru Sebe (Kyushu Inst. of Tech., Japan)
12:20-12:40	67	An LMI-Based Parameter Selection Procedure for an Amplitude- and Rate-Saturated Controller...54	Nehal Baiomy (Kyushu University, Japan), Ryo Kikuuwe (Hiroshima University, Japan)

### Model Predictive Control

Chair: Akira Kojima (Tokyo Metropolitan University, Japan)

13:40-15:00, Room 1

Schedule	No.	Title	Authors
13:40-14:00	27	Weight Selection Algorithm for Model Predictive Control...N/A	Sungmin Cho (The University of Tokyo, Japan), Masatsugu Otsuki (Japan Aerospace Exploration Agency, Japan), Takashi Kubota (Japan Aerospace Exploration Agency, Japan)
14:00-14:20	15	Automatic Controller Switching by Model-based Predictive Control for a PZT Stage...61	Yi Kai Peng (National Taiwan University, Taiwan), Fu-Cheng Wang (National Taiwan University, Taiwan)

14:20-14:40	96	A Predictive Control Strategy for Energy Management in Buildings with Radiant Floors and Thermal Storage...67	Sroush Rastegarpour (Politecnico di Milano, Italy), Mashid Ghaemi (Politecnico di Milano, Italy), Luca Ferrarini (Politecnico di Milano, Italy)
14:40-15:00	84	Finite Control Set Model Predictive Control for Two Level Inverter with Fixed Switching Frequency...74	Pagar Nikhil (VJTI, India), Kharade Sonam (VJTI, India), Madhusoodan Monika (VJTI, India), Sushama Wagh (VJTI, India)

## Robotic Systems

Chair: Ryo Kikuuwe (Hiroshima University, Japan)

13:40-15:00, Room 2

Schedule	No.	Title	Authors
13:40-14:00	34	A Validation of the Practical Non-Bernoulli Modeling for Asymmetric Hydraulic Arms...N/A	Yusuke Nabana (Shinshu University, Japan), Satoru Sakai (Shinshu University, Japan)
14:00-14:20	81	Robustness Evaluation of the Improved NCTF Controller for a Pneumatic Artificial Muscle Driven Stage...82	Teng Fong Tang (Universiti Teknikal Malaysia Melaka, Malaysia), ShinHorng Chong (Universiti Teknikal Malaysia Melaka, Malaysia)
14:20-14:40	17	Environmental Adaptation for Wheel-legged Robot Using External Force Given to Legs...89	Yuki Nishimura (Future University Hakodate, Japan), Sadayoshi Mikami (Future University Hakodate, Japan)
14:40-15:00	83	A Method of Joint Trajectory Planning of Multilegged Robot with Redundant Degrees of Freedom Legs using the Screw Theory...N/A	Yoichi Shigematsu (National Institute of Technology, Gunma College, Japan), Naoya Yoshinaga (National Institute of Technology, Gunma College, Japan), Jun'ya Terayama (Nagaoka University of Technology, Japan), Ryoichiro Tamura (National Institute of Technology, Gunma College, Japan), Yusuke Hiram (National Institute of Technology, Gunma College, Japan), Nobuto Hirakoso (National Institute of Technology, Gunma College, Japan)

## MSCS Plenaries: **Kimura-Award Commemorative Lecture**

Chair: Kenji Sugimoto (Nara Institute of Science and Technology, Japan)

16:30-17:10, Room 21C

**Takeshi Hatanaka** (Tokyo Institute of Technology, Japan)

**Title: Passivity-based Control and Optimization in Networked Robotics and Beyond**

## Day 2: Saturday March 10, 2018

### Modeling, System Identification and Estimation

Chair: Shyam Krishna Nagar (Indian Institute of Technology (BHU), India)

10:00-11:20, Room 1

Schedule	No.	Title	Authors
10:00-10:20	35	Disturbance Observer and Ageing Estimation for a Temperature Controlled Food Transporter...97	Elisabeth Luchini (Vienna University of Technology, Austria), Martin Kozek (Vienna University of Technology, Austria)
10:20-10:40	68	A Novel Technique for Order Reduction of Discrete-time Interval System...N/A	Amit Kumar Choudhary (Indian Institute of Technology (BHU), India), Shyam Krishna Nagar (Indian Institute of Technology (BHU), India)
10:40-11:00	58	Simultaneous Computation of Model Order and Parameter Estimation for System Identification Based on Opposition-Based Simulated Kalman Filter...105	Badaruddin Muhammad (Universiti Malaysia Pahang, Malaysia), Kamil Zakwan Mohd Azmi (Universiti Malaysia Pahang, Malaysia), Zuwairie Ibrahim (Universiti Malaysia Pahang, Malaysia), Ahmad Afif Mohd Faudzi (Universiti Malaysia Pahang, Malaysia), Dwi Pebrianti (Universiti Malaysia Pahang, Malaysia)
11:00-11:20	46	An Application of Simulated Kalman Filter Optimization Algorithm for Parameter Tuning in Proportional-Integral-Derivative Controllers for Automatic Voltage Regulator System...113	Badaruddin Muhammad (Universiti Malaysia Pahang, Malaysia), Dwi Pebrianti (Universiti Malaysia Pahang, Malaysia), N.M Ghani (Universiti Malaysia Pahang, Malaysia), Nor Hidayati Abdul Aziz (Multimedia University, Malaysia), Nor Azlina Ab Aziz (Multimedia University, Malaysia), Mohd Saberi Mohamad (Universiti Malaysia Kelantan, Malaysia), Mohd Ibrahim Shapiai (Universiti Teknologi Malaysia, Malaysia), Zuwairie Ibrahim (Universiti Malaysia Pahang, Malaysia)

### Flight Control

Chair: Kenji Fujimoto (Kyoto University, Japan)

10:00-11:20, Room 2

Schedule	No.	Title	Authors
10:00-10:20	28	Robust Terrain-Aided Localization of Spacecraft Using Low-Fidelity Asteroid Shape Model...121	Hirokazu Ishida (The University of Tokyo, Japan), Yuichi Tsuda (Japan Aerospace Exploration Agency, Japan)
10:20-10:40	33	Control System Design for Linearized System of a Quadrotor by a Combination of ASPR Based Output Feedback and Back-Stepping Strategy...N/A	Hiroshi Nonaka (Kumamoto University, Japan), Eiji Mori (Kumamoto University, Japan), Makoto Kumon (Kumamoto University, Japan), Ikuro Mizumoto (Kumamoto University, Japan)

10:40-11:00	98	A Study on Attitude Control System with Dual Reaction Wheel System for Ultra-Small Satellite of Observing Jupiter's Decametric Radio Emission...N/A	Ryoichiro Tamura (National Institute of Technology, Gunma College, Japan), Mizuki Ando (National Institute of Technology, Gunma College, Japan), Koji Shimazu (National Institute of Technology, Gunma College, Japan), Taku Takada (National Institute of Technology, Kochi College, Japan), Kentarou Kitamura (National Institute of Technology, Tokuyama College, Japan), Kazumasa Imai (National Institute of Technology, Kochi College, Japan), Nobuto Hirakoso (National Institute of Technology, Gunma College, Japan)
11:00-11:20	37	Development and Control of Wireless Mobile Surveillance Camera System with Omni Directional Lens...N/A	Junkyu Kim (Kumoh National Institute of Technology, Korea, South), Teasung Kim (Kumoh National Institute of Technology, Korea, South), Hyunsoo Lee (Kumoh National Institute of Technology, Korea, South)

## Intelligent Control

Chair: Toru Yamamoto (Hiroshima University, Japan)

12:30-14:10, Room 1

Schedule	No.	Title	Authors
12:30-12:50	65	Data-Driven Robust Control Using Reinforcement Learning...N/A	Phuong Ngo (UiT The Arctic University of Norway, Norway), Fred Godtlielsen (UiT The Arctic University of Norway, Norway)
12:50-13:10	82	Controller Design of DFIG-based WT by Using DE-Optimization Techniques...128	Om Prakash Bharti (Indian Institute of Technology (BHU), India), R. K. Saket (Indian Institute of Technology (BHU), India), Shyam Krishna Nagar (Indian Institute of Technology (BHU), India)
13:10-13:30	102	Towards Stagnation-Free Particle Swarm Optimization and its Application to PID Control Tuning...N/A	Victor Parque (Waseda University, Japan), Ahmed Khalifa (Egypt-Japan University of Science and Technology, Egypt), Tomoyuki Miyashita (Waseda University, Japan)
13:30-13:50	86	A Black Hole Algorithm with White Hole Operator and Its Application in Parameter Tuning of Proportional-Integral-Derivative Controller...N/A	Badaruddin Muhammad (Universiti Malaysia Pahang, Malaysia), Suad Khairi Mohammed (University of Technology, Iraq), Dwi Pebrianti (Universiti Malaysia Pahang, Malaysia), N.M Ghani (Universiti Malaysia Pahang, Malaysia), Nor Hidayati Abdul Aziz (Multimedia University, Malaysia), Nor Azlina Ab Aziz (Multimedia University, Malaysia), Mohd Ibrahim Shapiai (Universiti Teknologi Malaysia, Malaysia), Norazian Subari (Universiti Malaysia Pahang, Malaysia), Tasiransurini Ab Rahman (Universiti Tun Hussein Onn, Malaysia), Kamil Zakwan Mohd Azmi (Universiti

			Malaysia Pahang, Malaysia), Zuwairie Ibrahim (Universiti Malaysia Pahang, Malaysia)
13:50-14:10	40	Genetic Algorithm Based Design of PID and PDF Controllers for Velocity Tracking of a High-Rise Building Elevator...136	Ike-Lee Hill (University of the Witwatersrand, South Africa), Muhammed Mangera (University of the Witwatersrand, South Africa), Dushil Parshotam (University of the Witwatersrand, South Africa), Aarti Panday (University of the Witwatersrand, South Africa), Jimoh Olarewaju Pedro (University of the Witwatersrand, South Africa)

## Vehicle Control

Chair: Yasumasa Fujisaki (Osaka University, Japan)

12:30-13:50, Room 2

Schedule	No.	Title	Authors
12:30-12:50	39	Simultaneous Localization and Mapping of a Mobile Robot with Surveillance and Flying Cameras...144	Wen-Chung Chang (National Taipei University of Technology, Taiwan), Chia-Hung Wu (National Taipei University of Technology, Taiwan), Yang-Cheng Huang (National Taipei University of Technology, Taiwan), Dianthika Puteri Andini (National Taipei University of Technology, Taiwan)
12:50-13:10	89	Skid Control Enhancement for Small Electric Vehicle by Using Sliding Mode Control Strategy...151	Muhammad Asyraf Bin Shahrom (Universiti Malaysia Pahang, Malaysia), Mohamad Heerwan Bin Peeie (Universiti Malaysia Pahang, Malaysia), Muhammad Izhar Bin Ishak (Universiti Malaysia Pahang, Malaysia)
13:10-13:30	49	Analytical Modeling and Preliminary Fractional Order Velocity Control of a Small Scale Submersible...157	Isabela Roxana Birs (Technical University of Cluj-Napoca, Romania), Cristina Ioana Muresan (Technical University of Cluj-Napoca, Romania), Ovidiu Prodan (Technical University of Cluj-Napoca, Romania), Silviu Folea (Technical University of Cluj-Napoca, Romania), Clara Ionescu (Ghent University, Belgium)
13:30-13:50	95	Artificial Potential Field and Sliding Mode Strategies for Rendezvous Maneuver and Obstacle Avoidance...N/A	Nicoletta Bloise (Politecnico di Torino, Italy), Elisa Capello (Politecnico di Torino, Italy), Elisabetta Punta (National Research Council of Italy, Italy)

## Optimal Control

Chair: Noboru Sebe (Kyushu Institute of Technology, Japan)

14:30-15:50, Room 1

Schedule	No.	Title	Authors
14:30-14:50	99	Hybrid Optimal Control for Linear Discrete-Time Systems by Simultaneous Optimization Approach of System States and Mode Distributions...163	Gou Nakura (No Affiliation, Japan)
14:50-15:10	30	Modeling and Localized Feedforward Control of Thermal Deformations Induced by a Moving Heat	David van den Hurk (Eindhoven University of Technology, Netherlands), Siep Weiland



		Load...171	(Eindhoven Univ. of Tech., Netherlands), Koos van Berkel (ASML Netherlands B.V., Netherlands)
15:10-15:30	100	Computational Adaptive Optimal Control for Continuous-Time Linear Unknown Systems via Quadratic Performance Index with Cross Products...N/A	Qingquan Song (Osaka University, Japan), Yasumasa Fujisaki (Osaka University, Japan)
15:30-15:50	1	On Flexibility Assessment of Process Control Systems...179	Chuei-Tin Chang (National Cheng Kung University, Taiwan)

## Energy Systems

Chair: Toru Namerikawa (Keio University, Japan)

14:30-16:10, Room 2

Schedule	No.	Title	Authors
14:30-14:50	26	Optimal Sizing of Photovoltaic Systems for Loss Minimization in Distribution Network...185	Shunnosuke Ikeda (Keio University, Japan), Akiko Takeda (The Institute of Statistical Mathematics, Japan), Hiromitsu Ohmori (Keio University, Japan)
14:50-15:10	92	Optimal Energy Storage Evaluation of a Solar Powered Sustainable Energy System...193	Ewen Constant (University of South Wales, United Kingdom), Kary Thanapalan (University of South Wales, United Kingdom), Mark Bowkett (University of South Wales, United Kingdom)
15:10-15:30	32	Energy Management of Battery Electric Vehicles Hybridized with Supercapacitor using Stochastic Dynamic Programming...199	Hoda Marefat (University of Waterloo, Canada), Mohammadmehdi Jalalmaab (University of Waterloo, Canada), Nasser Lashgarian Azad (University of Waterloo, Canada)
15:30-15:50	5	Distributed Dual Objective Control of Energy Storage Systems...206	He Cai (Nanyang Technological University, Singapore), Guoqiang Hu (Nanyang Technological University, Singapore)
15:50-16:10	87	Wind Turbine Sliding Mode Control and Wind Farm Energy Optimization with Fatigue Constraints...N/A	Elisa Capello (Politecnico di Torino, Italy), Takayuki Wada (Osaka University, Japan), Elisabetta Punta (National Research Council of Italy, Italy), Yasumasa Fujisaki (Osaka University, Japan)

## MSCS Plenary Talk

Chair: Yoshio Ebihara (Kyoto University, Japan)

16:30-17:10, Room 21C

**Carsten W. Scherer** (University of Stuttgart, Germany)

**Title: On Structured Controller Synthesis by Convex Optimization**

## Day 3: Sunday March 11, 2018

### Control Applications

Chair: Toshiyuki Ohtsuka (Kyoto University, Japan)

9:00-10:40, Room 1

Schedule	No.	Title	Authors
9:00-9:20	88	Convergence Analysis of Weighted Averaging Consensus for Distributed Power Dispatch with Load Balancing...N/A	Kenta Hanada (Osaka University, Japan), Takayuki Wada (Osaka University, Japan), Izumi Masubuchi (Kobe University, Japan), Toru Asai (Nagoya University, Japan), Yasumasa Fujisaki (Osaka University, Japan)
9:20-9:40	85	A Robust Control Methodology Based on Active Disturbance Rejection Control and Input Shaping...N/A	Qingru Cui (China Guodian Group co. LTD, China), Yali Xue (Tsinghua University, China), Li Sun (Tsinghua University, China)
9:40-10:00	11	Efficient Disturbance Rejection for Dead-Time Processes using Internal Model Control...213	Robin M.C. De Keyser (Ghent University, Belgium), Cristina Ioana Muresan (Technical University of Cluj-Napoca, Romania), Clara Ionescu (Ghent University, Belgium)
10:00-10:20	22	Fast CU/PU Size Decision Algorithm and VLSI Architecture for HEVC Using Machine Learning...N/A	Fengyu Tsai (Osaka Electro-Communication University, Japan), Kei Furuta (Osaka Electro-Communication University, Japan), Gen Fujita (Osaka Electro-Communication University, Japan)
10:20-10:40	13	On the Performance of Higher Order Controllers: Adaptive Robust PID Controller Subject to Sliding Modes...N/A	Hadi Jahanshahi (University of Tehran, Iran), Naeimeh Najafizadeh Sari (University of Tehran, Iran)

### Nonlinear Systems

Chair: Yuh Yamashita (Hokkaido University, Japan)

9:00-10:40, Room 2

Schedule	No.	Title	Authors
9:00-9:20	61	Nonlinear System Identification by Affine Coordinate Unification of Locally Identified MIMO Linear Systems...220	Kazuya Nomura (Hokkaido University, Japan), Yuh Yamashita (Hokkaido University, Japan), Koichi Kobayashi (Hokkaido University, Japan)
9:20-9:40	31	Control of Driftless Systems Using Piecewise Constant Inputs...226	Dmitry Gromov (St. Petersburg State University, Russia), Fernando Castanos (Cinvestav del IPN, Mexico)
9:40-10:00	42	Pattern Formation in Self-regulating Homeostasis Model...N/A	Maya Kageyama (Osaka University, Japan), Atsushi Yagi (Osaka University, Japan)
10:00-10:20	59	Formation Control of Two-Wheeled Mobile Robots Based on Coupled Phase Oscillators with Bias...N/A	Tadashi Nakamura (Osaka Prefecture University, Japan), Koki Yoshida (Osaka Prefecture University, Japan), Keiji Konishi (Osaka Prefecture University, Japan), Naoyuki Hara (Osaka Prefecture University, Japan)

10:20-10:40	7	A Simulation Framework for Decentralized Formation Control of Non-holonomic Differential Drive Robots...232	Fahad Tanveer (Karachi Institute of Economics and Technology, Pakistan), Muhammad Bilal Kadri (Karachi Institute of Economics and Technology, Pakistan)
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