

SSS'11

The 43rd International Symposium

on

Stochastic Systems Theory and Its Applications

October 28-29, 2011

Bianca and Ritsumeikan University, Shiga, JAPAN

Session Schedule

October 28, 2011 (Friday), "Bianca", Otsu Port

From	To	Room A	Room B
10:00	10:15	Opening Address (Room A)	
10:15	11:41	Session: FA1 System Identification and Parameter Estimation 1 Chair: K. Kameyama (Fukui Nat. College of Tech.)	Session: FB1 Modeling, Filtering and Control of Stochastic Systems and Stochastic Processes 1 Chair: M. Ishikawa (Yamaguchi Univ.)
11:41	13:10	Lunch	
13:10	14:14	Session: FA2 System Identification and Parameter Estimation 2 Chair: T. Fukuda (Otemon Gakuin Univ.)	Session: FB2 Modeling, Filtering and Control of Stochastic Systems and Stochastic Processes 2 Chair: Y. Takeuchi (Osaka Univ. of Education)
14:14	14:30	Coffee Break	
14:30	15:56	Session: FA3 Neural Networks and Fuzzy Systems Chair: H. Ohtagaki (Okayama Univ. of Sci.)	Session: FB3 Applications in Engineering related to Stochastic Processes and Stochastic Systems 1 Chair: S. Fujita (Electronic Navigation Research Inst.)
15:56	16:15	Coffee Break	
16:15	17:30	Invited Session: Research Directions in Stochastic Dynamical Systems Chair: F. Kojima (Kobe Univ.)	
18:00	20:00	Banquet	

October 29, 2011 (Saturday), "Epoch Ritsumei 21", Ritsumeikan University

From	To	Room A	Room B	Room C
10:00	11:48	Organized Session SA1 Stochastic Robotics Co-chairs: M. Tanaka (Konan Univ.) and Y. Fukayama (Hiroshima Inst. of Tech.)	Session SB1 Mathematical Finance 1 Chair: S. Aihara (Tokyo Univ. of Science, Suwa)	Session SC1 Pattern Recognition, Computer Vision and image Processing Chair: I. Hanazaki (Tokyo Denki Univ.)
11:48	12:50	Lunch		
12:50	13:54	Session SA2 System Identification and Parameter Estimation 3 Chair: Y. Fujisaki (Osaka University)	Session SB2 Mathematical Finance 2 Chair: J. Akahori (Ritsumeikan Univ.)	Session SC2 Applications in Engineering related to Stochastic Processes and Stochastic Systems 2 Chair: T. Aoki (Hitachi, Ltd.)
13:54	14:10	Coffee Break		
14:10	15:36	Session SA3 Stochastic Optimization Methods and Evolutionary Methods Chair: S. Yamamoto (Kanazawa Univ.)	Session SB3 Analysis of Stochastic Systems and Stochastic Processes 1 Chair: K. Nishiguchi (Osaka Univ.)	Session SC3 Applications in Engineering related to Stochastic Processes and Stochastic Systems 3 Chair: K. Oura (Kokushikan Univ.)
15:36	15:50	Coffee Break		
15:50	17:16	Session SA4 Medical and Biomedical Systems Chair: T. Umetani (Konan Univ.)	Session SB4 Analysis of Stochastic Systems and Stochastic Processes 2 Chair: Y. Morita (Kyotogakuen Univ.)	Session SC4 Signal Detection and Statistical Signal Processing Chair: M. Suwa (OMRON Corporation)

October 28, 2011 (Friday)

Session: FA1, 10:15–11:41, Room A

System Identification and Parameter Estimation 1

Chair: K. Kameyama (Fukui Nat. College of Tech.)

10:15–10:35

- FA1-1 An H_∞ Norm Condition Based on Input-Output Covariances
K. Maeda and Y. Fujisaki (Osaka Univ.) 2

10:37–10:57

- FA1-2 Blind Deconvolution with IIR Filter by Projecting the Learning Law in FIR Approximation
T. Hirotsu, N. Saito and K. Sugimoto (Nara Inst. of Sci. and Tech.) 4

10:59–11:19

- FA1-3 On the Continuous-discrete Nonlinear Filters by Using Divided Difference Approximation
M. Takeno and T. Katayama (Doshisha Univ.) 6

11:21–11:41

- FA1-4 An Application of the Empirical Likelihood Method to Channel Estimation with Prior Information
H. Sakai and H. Yamakage (Kyoto Univ.) 8
-

Session: FB1, 10:15–11:41, Room B

Modeling, Filtering and Control of Stochastic Systems and Stochastic Processes 1

Chair: M. Ishikawa (Yamaguchi Univ.)

10:15–10:35

- FB1-1 Local Convergence of the Sequential Quadratic Method for Differential Games
A. Tanikawa (Osaka Inst. of Tech.), H. Mukai and M. Xu (Washington Univ.) 10

10:37–10:57

- FB1-2 Smoothing Splines with Continuous Data
V. Tyuryaev and C. Martin (Texas Tech. Univ.) 12

10:59–11:19

- FB1-3 Robust Filter Based Control of a Single-link Flexible Arm and Its Collision Detection Using Innovation Process
Y. Sawada (Kyoto Inst. of Tech.), T. Fujimoto (Osaka Univ.), J. Moritani (Kyoto Inst. of Tech.) and A. Tanikawa (Osaka Inst. of Tech.) 14

11:21–11:41

- FB1-4 A Method of Hybrid Optimization of the Observations for Stationary LQG Control Systems
Y. Takeuchi and R. Matsumi (Osaka Univ. of Education) 16
-

Session: FA2, 13:10–14:14, Room A

System Identification and Parameter Estimation 2

Chair: T. Fukuda (Otemon Gakuin Univ.)

13:10–13:30

- FA2-1 Modeling and Identification of Discrete Second-Order Systems via Stochastic Mechanics
A. Ohsumi (Kyoto Inst. of Tech.) 18

13:32–13:52	
FA2–2	Quantitative Evaluation for Two-dimensional Electromagnetic Propagation in a Dielectric Medium using Markov Chain Monte Carlo Method F. Kojima (Kobe Univ.) and J. S. Knopp (Air Force Research Lab., USA) 20
13:54–14:14	
FA2–3	Simultaneous Identification of Unknown System Matrix and Exogenous Input of Linear Stochastic Systems via Pseudomeasurement Approach K. Kameyama (Fukui Nat. College of Tech.) and A. Ohsumi (Kyoto Inst. of Tech.) 22

Session: FB2, 13:10–14:14, Room B
Modeling, Filtering and Control of Stochastic Systems and Stochastic Processes 2
Chair: Y. Takeuchi (Osaka Univ. of Education)

13:10–13:30	
FB2–1	Stochastic Optimal Control of an SIR Epidemic Model with Vaccination M. Ishikawa (Yamaguchi Univ.) 24
13:32–13:52	
FB2–2	An Approach to Hybrid Smoothing for Linear Continuous-Time Systems with Non-Gaussian Noises G. Nakura 26
13:54–14:14	
FB2–3	H_∞ Tracking with Preview for Linear Continuous-Time Markovian Jump Systems Including Infinite Horizon Case G. Nakura 28

Session: FA3, 14:30–15:56, Room A
Neural Networks and Fuzzy Systems
Chair: H. Ohtagaki (Okayama Univ. of Sci.)

14:30–14:50	
FA3–1	A New Multi-layered GMDH-type Neural Network Algorithm Using Principal Component-Regression Analysis T. Kondo and J. Ueno (Univ. of Tokushima) 30
14:52–15:12	
FA3–2	Medical Image Diagnosis of Liver Cancer by Multi-layered GMDH-type Neural Network Using Artificial Intelligence Technology T. Kondo and J. Ueno (Univ. of Tokushima) 32
15:14–15:34	
FA3–3	Design of Direct Adaptive Fuzzy Controller for MEMS Gyroscope J. Fei and W. Juan (Hohai University) 34
15:36–15:56	
FA3–4	Probabilistic Approach for Vague Perceptions of Complex Phenomena T. Fukuda (Otemon Gakuin Univ.) 36

Session: FB3, 14:30–15:56, Room B

Applications in Engineering related to Stochastic Processes and Stochastic Systems 1

Chair: S. Fujita (Electronic Navigation Research Inst.)

14:30–14:50

- FB3–1 Load Balancing Routing Protocol with Bayesian Learning of Link Utilization Ratio
T. Teramoto and M. Hara (Matsue College of Tech.) 38

14:52–15:12

- FB3–2 Optimal Vector Smoothing Splines with Coupled Constraints
H. Fujioka (Fukuoka Inst. of Tech.) and H. Kano (Tokyo Denki Univ.) 40

15:14–15:34

- FB3–3 Detection and Exclusion of Abnormal Measurement Data in GNSS Precise Point Positioning
A. Chabata, M. Kamimura, Y. Kubo and S. Sugimoto (Ritsumeikan Univ.) 42

15:36–15:56

- FB3–4 Precise Point Positioning by Combining GPS and GLONASS
T. Miyazaki, Y. Kubo and S. Sugimoto (Ritsumeikan Univ.) 44

Invited Session, 16:15–17:30, Room A

Research Directions in Stochastic Dynamical Systems

Chair: F. Kojima (Kobe Univ.)

- IS–1 Propagation of Uncertainty in Dynamical Systems
H. T. Banks and S. Hu (North Carolina State Univ.) 46

- IS–2 Methods of Parameter Subset Selection
F. Kappel (Univ. of Graz) 48

October 29, 2011 (Saturday)

Organized Session: SA1, 10:00–11:48, Room A

Stochastic Robotics

Co-chairs: M. Tanaka (Konan Univ.) and Y. Fukayama (Hiroshima Inst. of Tech.)

10:00–10:20

- SA1–1 Detection of Mobile Objects for Outdoor Navigation Robots
M. Tanaka, M. Wada, T. Umetani (Konan Univ.) and M. Ito (Maizuru Nat. College of Tech.)
..... 50

10:22–10:42

- SA1–2 Framework of Sensor Fusion Network for an Inverted Pendulum Mobile Robot KoRo
M. Wada, M. Tanaka, T. Umetani, T. Kuwata, N. Kuga, A. Kojima, T. Matsuda, T. Sakai, N. Adachi, K. Inaoka (Konan Univ.) and M. Ito (Maizuru Nat. College of Tech.) 52

10:44–11:04

- SA1–3 A Differential Evolution-Based Approach for Global Localization of Mobile Robot
M. Ito (Maizuru Nat. College of Tech.) and M. Tanaka (Konan Univ.) 54

11:06–11:26

- SA1–4 Localization of Wireless LAN Client in Multistory Buildings using Strength of Received Signals
in State Space Framework
T. Umetani, S. Yamane, T. Yamashita and Y. Tamura (Konan Univ.) 56

11:28–11:48

- SA1–5 Sensor Fusion of Vision System and Thermal Imaging Sensor for Target Tracking
T. Umetani, N. Kuga, M. Tanaka, M. Wada (Konan Univ.) and M. Ito (Maizuru Nat. College
of Tech.) 58

Session: SB1, 10:00–11:48, Room B

Mathematical Finance 1

Chair: S. Aihara (Tokyo Univ. of Science, Suwa)

10:00–10:20

- SB1–1 Principal Component Analysis Applied to Forward Rates II: Experiments with Dummy Data
N.-L. Liu, I. Shin and Y. Yasuda (Ritsumeikan Univ.) 60

10:22–10:42

- SB1–2 On Approximation of Eigenvalues of Spot Cross Volatility Matrix
N.-L. Liu and H.-L. Ngo (Ritsumeikan Univ.) 62

10:44–11:04

- SB1–3 Optimal Stopping Problems for Spectrally Negative Levy Processes and Applications in Finance
M. Egami (Kyoto Univ.) and K. Yamazaki (Osaka Univ.) 64

11:06–11:26

- SB1–4 Some Numerical Results of Sensitivity Analysis for Expected Values w.r.t. Linear SDE with
Long Memory
K. Yasuda (Hosei Univ.) 66

11:28–11:48

- SB1–5 A Numerical Examination of Asymptotic Behavior of Prices of Path Dependent Options
H. Uchida (Ritsumeikan Univ.) 68

Session: SC1, 10:00–11:48, Room C

Pattern Recognition, Computer Vision and image Processing

Chair: I. Hanazaki (Tokyo Denki Univ.)

10:00–10:20

- SC1–1 Blind Deconvolution of Rotational Motion Blurred Images
N. Isoe, R. Maruo and S. Sugimoto (Ristumeikan Univ.) 70

10:22–10:42

- SC1–2 Probabilistic Graph Minor Generation with Dynamic Reference to Geographics Annotation
K. Kamejima (Osaka Inst. of Tech.) 72

10:44–11:04

- SC1–3 Investigation of Lighting Conditions for Teleoperation of Robot Arms by Image Processing and Force-free Control
A. Pallegedara, Y. Matsuda, T. Sugi, T. Matsumoto, K. Tsukamoto (Saga Univ.), N. Egashira (Kurume Nat. College of Tech.) and S. Goto (Saga Univ.) 74

11:06–11:26

- SC1–4 Statistical Reflectance Property Estimation Method of Metallic Surface
M. Suwa, S. Tou (OMRON Corporation) and L. Ma (Shanghai Jiao Tong Univ.) 76

11:28–11:48

- SC1–5 KanNon System - Vowel Recognition with Discrimination of Phoneme Intervals
M. Taniguchi, K. Nishida, H. Murata, T. Sagara and S. Sugimoto (Ritsumeikan Univ.) 78

Session: SA2, 12:50–13:54, Room A

System Identification and Parameter Estimation 3

Chair: Y. Fujisaki (Osaka Univ.)

12:50–13:10

- SA2–1 System Identification of Highly Nonlinear Equation of Motion for a Rigid Body in Water
H. Isshiki (Inst. of Mathematical Analysis) and S.-J. Lee (Chungnam National Univ.) 80

13:12–13:32

- SA2–2 Prefiltering of Frequency Domain Data Based on Wold's Decomposition for MIMO System Identification
M. Matsubara 82

13:34–13:54

- SA2–3 Experimental Validation of Adaptive Velocity and Acceleration Estimators with MEMS-Based Inertial Sensors
T. Nimiya, M. Sakamoto, Y. Kawakami, H. Suemitsu and T. Matsuo (Oita Univ.) 84

Session: SB2, 12:50–13:54, Room B

Mathematical Finance 2

Chair: J. Akahori (Ritsumeikan Univ.)

12:50–13:10

- SB2–1 Identification Problem for Heston Stochastic Volatility Model by Using Non-central Chi-Square Random Generation Method
S. Aihara (Tokyo Univ. of Science, Suwa), A. Bagchi (Twente Univ.) and S. Saha (Linköping Univ.) 86

13:12–13:32

- SB2–2 Principal Component Analysis Applied to Forward Rates I: Experiments with Empirical Data
N.-L. Liu, I. Shin, and Y. Yasuda (Ritsumeikan Univ.) 88

13:34–13:54

- SB2–3 An Application of Put-Call Symmetry to Stochastic Numerical Analysis
Y. Imamura, Y. Ishigaki, T. Kawagoe and T. Okumura (Ritsumeikan Univ.) 90

Session: SC2, 12:50–13:54, Room C

Applications in Engineering related to Stochastic Processes and Stochastic Systems 2

Chair: T. Aoki (Hitachi, Ltd.)

12:50–13:10

- SC2–1 Reliability Analysis for Degradation Data Based On Stochastic Process Models and Bayesian Estimations
T. Kaise (Univ. of Hyogo) 92

13:12–13:32

- SC2–2 Multi-Layer Ionospheric VTEC Estimation for GNSS Positioning
M. Ohashi, T. Hattori, Y. Kubo and S. Sugimoto (Ritsumeikan Univ.) 94

13:34–13:54

- SC2–3 Detection and Correction of Cycle Slips in GNSS Signal Tracking for Single Frequency Applications
S. Fujita, S. Saito and T. Yoshihara (Electronic Navigation Research Inst.) 96

Session: SA3, 14:10–15:36, Room A

Stochastic Optimization Methods and Evolutionary Methods

Chair: S. Yamamoto (Kanazawa Univ.)

14:10–14:30

- SA3–1 Stability Analysis of the Particle Swarm Optimization Algorithm Considering Interaction between Particles
Y. Wakasa (Yamaguchi Univ.), S. Ohno (Hiroshima Univ.), K. Tanaka, and Y. Nishimura (Yamaguchi Univ.) 98

14:32–14:52

- SA3–2 System Trading of Diversified Investment by Hybrid Method of GP and GA
N. Koide and K. Okuhara (Osaka Univ.) 100

14:54–15:14

- SA3–3 Assignment of Jurisdiction Area to Fire Department by Minimizing Welfare Loss
K. Okuhara (Osaka Univ.) 102

15:16–15:36

- SA3–4 Interpolation Search for Swarm Intelligence to Optimization Problem
K. Okuhara and T. Tanaka (Osaka Univ.) 104

Session: SB3, 14:10–15:36, Room B

Analysis of Stochastic Systems and Stochastic Processes 1

Chair: K. Nishiguchi (Osaka Univ.)

14:10–14:30

- SB3–1 On the Liquidity Trap in the Interval (2001,2006) with Zero Interest Rate
Y. Morita and S. Miyagawa (Kyoto Gakuen Univ.) 106

14:32–14:52		
SB3–2	Estimations of Vocal Area Functions During Vowel Production From MRI Data and Speech Signal A. Fukatsu, M. Ishii, P. T. Nhut, T. Sayama and I. Hanazaki (Tokyo Denki Univ.)	108
14:54–15:14		
SB3–3	Robust Stability of Markovian Jump Stochastic Uncertain Systems with Mode-dependent Time-varying Delays M. Hua, J. Fei and W. Dai (Hohai Univ.)	110
15:16–15:36		
SB3–4	Chaotic Behavior in Piecewise Continuous Maps T. Yamaguchi and H. Ohtagaki (Okayama Univ. of Sci.)	112

Session: SC3, 14:10–15:36, Room C

Applications in Engineering related to Stochastic Processes and Stochastic Systems 3

Chair: K. Oura (Kokushikan Univ.)

14:10–14:30		
SC3–1	Differential Flatness Theory and Extended Kalman Filtering for Sensorless Control of Induction Motors G. Rigatos (Industrial Systems Institute) and P. Siano (Univ. of Salerno)	114
14:32–14:52		
SC3–2	A Music Transcription Algorithm Applying State Estimation and Parameter Identification on the Time-frequency Plane Y. Fukayama (Hiroshima Inst. of Tech.) and D. Tanaka (Nara Inst. of Sci. and Tech.)	116
14:54–15:14		
SC3–3	Stochastic Investment Trading Model for Selection of Companies Under Uncertainty in Stock Markets H. V. Pham, E. W. Cooper and K. Kamei (Ritsumeikan Univ.)	118
15:16–15:36		
SC3–4	A Simulation of the Radiation Diffusion by a Stochastic Diffusion Model with Geographical Data N. Shimizu and T. Tsuchiya (Ritsumeikan Univ.)	120

Session: SA4, 15:50–17:16, Room A

Medical and Biomedical Systems

Chair: T. Umetani (Konan Univ.)

15:50–16:10		
SA4–1	Human Motion Analysis of a Hula Hooper using Motion Capture System K. Oura (Kokushikan Univ.), Y. Kanai and I. Hanazaki (Tokyo Denki Univ.)	122
16:12–16:32		
SA4–2	The Relationship of the Heartbeat and Interbreath Dynamics in Young and Elderly People W. Bucaoto and A. Lenskiy (Korea Univ. of Tech. and Education)	124
16:34–16:54		
SA4–3	EEG Pattern Recognition Based on Frequency Analysis During Imaging and Gazing Tasks K. Kinoshita, T. Yamaguchi, H. Uno, Y. Nishihara, M. Maeda and K. Inoue (Kyushu Inst. of Tech.)	126

16:56–17:16

- SA4-4 Basic Consideration on Inverse Problem for Vocal Tract Deformation from Non-Uniform Tube
J. S. Lee (Univ. of Ulsan) and H. Isshiki (Inst. of Mathematical Analysis) 128

Session: SB4, 15:50–16:54, Room B

Analysis of Stochastic Systems and Stochastic Processes 2

Chair: Y. Morita (Kyotogakuen Univ.)

15:50–16:10

- SB4-1 Multivariate Itakura-Saito Distance for Spectral Estimation: Relation Between Time and Spectral Domain Relative Entropy Rates
A. Ferrante, C. Masiero and M. Pavon (Univ. of Padova) 130

16:12–16:32

- SB4-2 Convergence and Confidence Intervals of a Stochastic Differential Equation
P. Xue and S. Yamamoto (Kanazawa Univ.) 132

16:34–16:54

- SB4-3 Local Smoothness of the Densities of Solutions of SDEs with Singular Coefficients
M. Hayashi (Osaka Univ. and Japan Sci. and Tech. Agency), A. Kohatsu and G. Yuki (Ritsumeikan Univ. and Japan Sci. and Tech. Agency) 134

Session: SC4, 15:50–17:16, Room C

Signal Detection and Statistical Signal Processing

Chair: M. Suwa (OMRON Corporation)

15:50–16:10

- SC4-1 Automatic Modulation Classification Using PDF Approximation
Y. Jin, S. Ohno and S. Tokuhara (Hiroshima Univ.) 136

16:12–16:32

- SC4-2 A Road Deviation Decision Method Using State Diagram and Statistical Hypothesis Test in Map Matching
T. Aoki, M. Bando, T. Hiruta (Hitachi, Ltd.), K. Kato, A. Kawabata and Z. Liu (Clarion Co., Ltd.) 138

16:34–16:54

- SC4-3 Analytical Solution to the Equation of Brillouin Optical Time Domain Reflectometry and Its Properties
K. Nishiguchi (Osaka Univ.) 140

16:56–17:16

- SC4-4 Experimental and Numerical Study of Tennis Ball Trajectories
M. Gradinscak (Korea Univ. of Tech. and Edu.), F. Jafar, A. Antiohos (Victoria Univ.) and S. Y. Yang (Korea Univ. of Tech. and Edu.) 142