

Science of Modeling

- The 30th Anniversary of
the Information Criterion (AIC)-

Pacifico Yokohama

December 14-17, 2003

Co-sponsors

National Institute of Genetics
National Institute of Polar Research
National Institute of Informatics
Japan Statistical Society
The Behaviormetric Society of Japan
Japanese Society of Applied Statistics
Japanese Society of Computational Statistics
The Biometric Society of Japan
The Institute of Electronics, Information and
Communication Engineers
Information Processing Society of Japan

Keynote Talk

Hirotsugu Akaike (Professor Emeritus, ISM)

Session 1.

The Origin and Progress in the AIC Statistics

Session 2.

Bayesian Modeling for Ill-posed Decomposition Problems

Session 3.

Statistical Modeling of Spatio-Temporal Phenomena

Session 4.

Knowledge Discovery in Complex Systems via Modeling

Session 5.

Statistical Science of Genes and Evolution

Program

Sunday Dec. 14

12:00-13:30	Reception
13:30-13:40	Opening Address Kitagawa, G. (ISM/GUAS)
13:40-15:00	Session 1 Chairs: Tanabe, K. (ISM/GUAS) , Findley, D. (U.S. Census Bureau)
	An Overview of the Information Criteria Kitagawa, G.* (ISM/GUAS), Konishi, S. (Kyushu U.)
	Implementation of Optimal Control for Thermal Power Plant Boilers Based on Statistical Model Nakamura, H. (Former Research Engineer for Kyushu Electric Power Co.)
15:00-15:10	Short Break
15:10-16:30	Recent Development of Information Criteria Konishi, S.* (Kyushu U.), Kitagawa, G. (ISM/GUAS), Hierarchical Model, Singularity, and Model Selection Amari, S. (RIKEN)
16:30-16:50	Break

16:50-18:20 **Session 2.1**
Chair: Higuchi, T. (ISM/GUAS)

Introduction (10min)

Ishiguro, M. (ISM/GUAS)

A Bayesian Logit Age-Period-Cohort Model

Nakamura, T. (ISM/GUAS)

Modeling of "Myself" in Statistical Analysis

Ishiguro, M. (ISM/GUAS)

Monday Dec. 15

9:30-10:50 **Session 2.2**
Chair: Kawasaki, Y. (ISM/GUAS)

Exploitation of Prior Information and Knowledge Discovery: Decomposition of Daily Sales of a Restaurant for Micromarketing

Yamaguchi, R. , Tsuchiya, E., Higuchi, T.* (ISM/GUAS)

Generalizations of the Box-Jenkins Airline Model with Frequency-Specific Seasonal Coefficients

Aston, J., Findley, D.* (U.S. Census Bureau) , Wills, K. , Martin, D.

10:50-11:00 **Short Break**

(Place: 1F Main Hall)

11:00-12:00 **Keynote Address**
Chair: Kitagawa, G. (ISM/GUAS)

On the Art of Modeling; Illustrated with the Analysis of the Golf Swing Motion
Hirotsugu Akaike (Professor Emeritus, ISM)

12:00-13:30 **Lunch Break**

13:30-15:00 **Poster Session**

15:00-16:20 **Session 2.3**
Chair: Wago, H. (Nagoya U.)

Bayesian Perspectives on Modeling and Analysis of Non-Ignorable Missingness
Chib, S. (Washington U. St.Louis)

Bayesian Modelling of Time- Frequency Coefficients for Signal Processing
Wolfe, P.J.* (Cambridge U.), Godsill, S.J.

16:20-16:30 **Short Break**

16:30-18:00 **Session 3.1**
Chair: Yajima, Y. (U. Tokyo)

Introduction (10min)
Higuchi, T. (ISM/GUAS)
Space-Time Model for Regional Seismicity and Detection of Crustal Stress Changes
Ogata, Y. (ISM/GUAS)
Dynamic Multi-Resolution Spatial Models
Johannesson, G., Cressie, N.* (Ohio State U.), Huang, H.-C.

Tuesday Dec.16

10:00-12:00 **Session 3.2**
Chairs: Ogata, Y. (ISM/GUAS) , Iba, Y. (ISM)

Directional Rates of Change Under Spatial Process Models
Banerjee, S., Gelfand, A. E.*(Duke U.), Sirmans, C.F.
Information Square Root Filter and Smoother Algorithm Following the Time Dependent Inversion Technique and its Application to Time Series of Crustal Deformation Data
Ozawa, S. (Geographical Survey Institute of Japan)
A Sample of Monte Carlo Methods in Robotics and Vision
Dellaert, F. (Georgia Inst. Tech.)

12:00-13:30 **Lunch Break**

13:30-15:00 **Session 4.1**
Chairs: Tong, H (U. Hong Kong/LSE), Kano, Y. (Osaka U.)

Introduction (10min)
Iba, Y. (ISM)
Stepwise Prediction for Economic Time Series by Using Vector Autoregressive Model
Sato, S. (ISM/GUAS)

Nonlinear System Modeling and Predictive Control Based on RBF-ARX model
Peng, H.* (Central South U./ISM), Ozaki, T.

15:00-15:10 **Short Break**

15:10-16:30 Neural Network Simulations by Cascade Correlation and Knowledge-Based Cascade Correlation Networks
Takane, Y.* (McGill U.), Oshima-Takane, Y. , Shultz, T.R.
Some Recent Semi-Parametric Developments in Dimension Reduction for High Dimensional Time Series Data.
Tong, H. (U. Hong Kong/LSE)

16:30-18:00 **Poster Session**

18:00-21:00 **Banquet**
(Grand Inter Continental Hotel, 3F Pacific)

Wednesday Dec. 17

9:10-10:30 **Session 5**
Chairs: Adachi, J. (ISM/GUAS), Hasegawa, M. (ISM/GUAS)

Analyses of Genome Data for Inferring Evolutionary History of Life
Hasegawa, M. (ISM/GUAS)
Modeling of Variable Evolutionary Rates to Estimate Divergence Times and Adaptive Evolution
Kishino, H.* (U. Tokyo), Thorne, J.L. , Seo, T.-K., Kajitani, Y.

10:30-10:40 **Short Break**

10:40-12:00 Information from Data on Pedigree Structures
Thompson, E. A.(U. Washington)
What Lies Beyond Genome Sequences? : From Genes to Systems
Hotta, Y. (NIG)

12:00-13:30 **Lunch Break**

13:30-14:50 **Session 4.2**
Chairs: Ishiguro, M. (ISM/GUAS) , Fukumizu, K. (ISM)

Causal Inference Using Nonnormality
Kano, Y.* (Osaka U.), Shimizu, S.
CATDAP : Categorical Data Analysis Program for Data Mining
Sakamoto, Y. (ISM/GUAS)

14:50-15:00 **Short Break**

15:00-16:20 Combining Microarrays and Biological Knowledge for Estimating Gene Networks via Bayesian Networks
Imoto, S.* (U. Tokyo), Higuchi, T. , Goto, T. , Tashiro, K. , Kuhara, S. , Miyano, S.

Universal Induction Machine dPLRM for Probabilistic Multiclass Discrimination
Tanabe, K. (ISM/GUAS)

16:20-16:30 **Closing** **Tanabe, K. (ISM/GUAS)**

Posters

P001 FIPS 140-2 Statistical Test Suite Has Inappropriate Significant Levels
Song-Ju Kim (Communications Research Laboratory), Ken Umeno (Communications Research Laboratory), Akio Hasegawa (Communications Research Laboratory)

P002 Validity Check of NIST 800-22 Statistical Test Suite for Randomness
Song-Ju Kim (Communications Research Laboratory), Ken Umeno (Communications Research Laboratory), Akio Hasegawa (Communications Research Laboratory)

P003 Lebesgue Spectrum Analysis for Chaotic Monte Carlo Computation
Ken Umeno (Communications Research Laboratory, I.A.I. and ChaosWare, Inc.)

P004 Spatial Analysis of Human Behavior in Ubiquitous Environment
Kazuhiko Shibuya,(Cyber Assist Research Center, National Institute of Advanced Industrial Science and Technology)

P005 Analysis of Effective Connectivity in fMRI Experiments by State-Space Models
Moon-Ho Ringo Ho (Department of Psychology, McGill University)

P006 Algebraic Geometry, Zeta Functions, and Marginal Likelihood of Bayesian Statistics
Sumio Watanabe (Tokyo Institute of Technology), Keisuke Yamazaki (Tokyo Institute of Technology)

P007 Statistical inverse problem in feedback system and diagnosis of feedback paths
Kuniharu Kishida (Department of Information Science, Gifu University)

P008 Chaos Associative Memory
Masahiro Nakagawa (Nagaoka University of Technology)

P009 Invariant Measure of Chaos Neurons
Masahiro Nakagawa (Nagaoka University of Technology)

P010 Extracting and screening activities in Space/Time/Frequency EEG data using Parallel Factor Analysis
Fumikazu Miwakeichi (RIKEN, Brain Science Institute), Eduardo Martínez-Montes (Cuban Neuroscience Center), Pedro A. Valdés-Sosa (Cuban Neuroscience Center), Nobuaki Nishiyama (RIKEN Brain Science Institute), Hiroaki Mizuhara (RIKEN Brain Science Institute), Yoko Yamaguchi (RIKEN Brain Science Institute)

P011 Characterization of epileptic brain dynamics by impulse response function based on AR model
Fumikazu Miwakeichi (RIKEN, Brain Science Institute), Sunao Uchida (Waseda University), Andreas Galka (The Institute of Statistical Mathematics, Kiel University, Germany), Hiroshi Arakaki (Tokyo Medical and Dental University), Nobuhide Hirai (Jichi Medical School), Taketoshi Maehara (Tokyo Medical and Dental University), Kensuke Kawai (Tokyo Medical and Dental University), Hiroyuki Shimizu (Tokyo Medical and Dental University)

P012 On Likelihood Ratio Tests for Dimensionality Selection
Yoshio Takane (McGill University), Peter G. M. van der Heijden (Utrecht University), Michael W. Browne (Ohio State University)

P013 Statistical Inference using Stochastic Switching Models for the Discrimination of Unobserved State
Tadahiko Sato (Department of Statistical Science, The Graduate University for Advanced Studies), Tomoyuki Higuchi (Department of Prediction and Control, The Institute of Statistical Mathematics), Genshiro Kitagawa (The Institute of Statistical Mathematics)

P014 Adaptive Learning Machines for Nonlinear Classification and Generalized Information Criteria
Tomohiro Ando (Graduate School of Mathematics Kyushu University), Sadanori Konishi (Graduate School of Mathematics Kyushu University)

P015 Information Criteria for the Identification of the Box-Cox Transformation Model
Feng Yao (Faculty of Economics, Kagawa University)

P016 Empirical Bayes adjustment of regularization in ill-posed linear inverse problems by ABIC
Yuji Mitsuhashi (National Institute of Advanced Industrial Science and Technology, Japan)

P017 Modeling Correlated Noise Sources and Detection of Information Flows
Yoko Tanokura (Department of Statistical Science, The Graduate University for Advanced Studies), Genshiro Kitagawa (The Institute of Statistical Mathematics; Department of Statistical Science, The Graduate University for Advanced Studies)

P018 4SID Identification of Continuous-Time Stochastic Systems via Distribution-based Approach
Kentarō Kameyama (Kyoto Institute of Technology), Akira Ohsumi (Kyoto Institute of Technology)

P019 Non-linear filtering with dynamic programming to adjust non-uniform sampling locations
Masako Kamiyama (Railway Technical Research Inst., The Graduate Univ. for Advanced Studies), Tomoyuki Higuchi (The Institute of Statistical Mathematics)

P020 Prediction of daily sales of a restaurant based on the state space modeling
Rui Yamaguchi (Faculty of Mathematics, Kyushu University), Eiko Tsuchiya (School of Science, Tokyo Institute of Technology), Tomoyuki Higuchi (Institute of Statistical Mathematics)

P021 Modeling Share Dynamics by Extracting Competition Structure
Masahiro Kimura (NTT Communication Science Laboratories), Kazumi Saito (NTT Communication Science Laboratories), Naonori Ueda (NTT Communication Science Laboratories)

P022 Two Bayesian Modeling Approaches for an Onset Time Determination of Magnetic Pulsations
Keiko Fukuyama (Department of Earth and Planetary Sciences, Kyushu University, Japan), Tomoyuki Higuchi (The Institute of Statistical Mathematics, Japan), Teiji Uozumi (Space Environment Research Center, Kyushu University, Japan), Hideaki Kawano (Department of Earth and Planetary Sciences, Kyushu University, Japan), Kiyohumi Yumoto (Space Environment Research Center, Kyushu University, Japan), the CPMN Observation Group

P023 Knowledge Discovery Using Evolutionary Neural Networks
Paulito P. Palmes (Department of Information and Computer Sciences, Toyohashi University of Technology), Taichi Hayasaka (Department of Information and Computer Engineering, Toyota National College of Technology), Shiro Usui (RIKEN Brain Science Institute)

P024 Synchronization phenomena in a large population of integrate-and-fire neurons with a refractory period
Yasuomi Daishin Sato (Tokyo Institute of Technology), Rei Asahina (Tokyo Institute of Technology)

P025 An adaptive user interface based on online estimation of time-varying mixing weight of mixture model by particle filters
Takahiro Hyakudome (Faculty of Engineering, Kyushu Institute of Technology), Norikazu Ikoma (Faculty of Engineering, Kyushu Institute of Technology), Hiroshi Maeda (Faculty of Engineering, Kyushu Institute of Technology)

P026 Structure from motion for multiple objects by Rao-Blackwellized particle filters
Yasutake Miyahara (Faculty of Engineering, Kyushu Institute of Technology), Tsuyoshi Uchino (Faculty of Engineering, Kyushu Institute of Technology), Norikazu Ikoma (Faculty of Engineering, Kyushu Institute of Technology), Hiroshi Maeda (Faculty of Engineering, Kyushu Institute of Technology)

P027 Asymptotic Behaviour of Least Squares for a Multi-Layered Perceptron Model
Masashi Kitahara (Department of Information and Computer Sciences, Toyohashi University of Technology), Taichi Hayasaka (Department of Information and Computer Engineering, Toyota National College of Technology), Shiro Usui (Brain Science Institute, RIKEN)

P028 Simplex Mixture Models for Multi-topic Text
Naonori Ueda (NTT Communication Science Laboratories), Kazumi Saito (NTT Communication Science Laboratories)

P029 On Penalized Likelihood Estimation of Yield Curves
Yoshinori Kawasaki (The Institute of Statistical Mathematics), Tomohiro Ando (Kyushu University)

P030 Nonparametric Statistical Inference in Production Function
Yoko Konishi (Kyoto University (Japan Society for the Promotion of Science)), Yoshihiko Nishiyama (Kyoto University), Tomohiro Ando (Kyushu University), Yoshinori Kawasaki (The Institute of Statistical Mathematics)

P031 A Statistical Analysis for Fundamental Frequency Patterns in Infant Language Acquisition
Hiroko Kato (NTT), Tomohiro Nakatani (NTT), Sachiyo Kajikawa (NTT), Shigeaki Amano (NTT)

P032 Extracting Two Factors of Information from Visual Inputs by a Product Model of Self-Organizing Map and Neural Gas
Akira Date (Communications Research Laboratory), Koji Kurata (Faculty of Engineering, University of the Ryukyus)

P033 Bayesian Computation via Parametric Adaptive Importance Sampling
Ryo Yoshida (Department of Statistical Science, School of Mathematical and Physical Science, The Graduate University for Advanced Studies)

P034 Model analysis of the ion channel diseases of muscle
Kazuko Terada (Toho University School of Medicine), Chiaki Nishimura (Toho University School of Medicine)

P035 Bayesian Estimation of Interactions among Individuals Using MCMC Method
Masahilo Okabe (The Graduate University for Advanced Studies), Masaharu Tanemura (The Institute of Statistical Mathematics)

P036 A New Parametric Approach to Density Estimation
Tadayoshi Fushiki (The Institute of Statistical Mathematics), Shingo Horiuchi (Access Network Service Systems Laboratories, NTT Corp.), Takashi Tsuchiya (The Institute of Statistical Mathematics)

P037 A method of multiple-case diagnostics in Cox proportional hazards model
Jimin Sung (Okayama University), Yutaka Tanaka (Okayama University)

P038 Local Regression by Analytic Neural Network for Multiple View Shape Extraction
Mohamad Ivan Fanany (Imaging Science and Engineering, Tokyo Institute of Technology), Itsuo Kumazawa (Imaging Science and Engineering, Tokyo Institute of Technology)

P039 Multivariate Normal Mixture Model with Missing Regions
Nagatomo Nakamura (Sapporo Gakuin Univ.), Genta Ueno (Institute of Statistical Mathematics), Tomoyuki Higuchi (Institute of Statistical Mathematics), Sadanori Konishi (Kyushu Univ.)

P040 Estimation of a Number of Components in Multivariate Normal Mixture Model using Information Criteria
Nagatomo Nakamura (Sapporo Gakuin Univ.), Sadanori Konishi (Kyushu Univ.)

P041 A Simple Scale for Modeling Additive and Multiplicative Phenomena
Shigeru Kumazawa (Incorporated Administrative Agency, Japan Nuclear Energy Safety Organization)

P042 Nonstationary Bayesian times series analysis for network traffic by decomposition model into trend, periodic and AR components
Taketomi Shimizu (College of Engineering, Hosei University), Kazuyuki Imazu (College of Engineering, Hosei University), Norikazu Ikoma (Kyushu Institute of Technology), Kazuo Yana (Hosei University Reserch Institute)

P043 The Model of Structural Analysis for Subdivided Cultures
Tetsuya Onoda (Doctoral Program, Graduate School of Media and Governance, KEIO University)

P045 Selecting Optimal Subset Autoregressive Models in Possibly Misspecified Autoregressive Time Series
Ching-Kang Ing (Institute of Statistical Science, Academia Sinica)

P046 On association problem for sensor fusion in dynamic situation using particle filters
Wataru Ito (Faculty of Engineering, Kyushu Institute of Technology), Norikazu Ikoma (Faculty of Engineering, Kyushu Institute of Technology), Hiroshi Maeda (Faculty of Engineering, Kyushu Institute of Technology)

P047 A kernel method for hierarchical and non-hierarchical clustering
Kenji Fukumizu (Institute of Statistical Mathematics)

P048 An Example of Sequential Monte Carlo Block Sampling Method
Stéphane Sénécal, (The Institute of Statistical Mathematics), Arnaud Doucet (Cambridge University)

P049 Adaptive Model Selection and Assessment
Xiaotong Shem (School of Statistics University of Minnesota Minneapolis), Hsin-Cheng Huang (Institute of Statistical Science, Academia Sinica), Jimmy Ye (Baruch College City University of New York)

P051 Bayesian Inference in Smooth Transition Autoregressions
Hedibert Freitas Lopes (Graduate School of Business, University of Chicago), Esther Salazar (Institute of Mathematics, Federal University of Rio de Janeiro)

P052 Analysis earthquake clustering features by using stochastic reconstruction
Jianchang Zhuang (Institute of Statistical Mathematics), Yosihiko Ogata (Institute of Statistical Mathematics), David Vere-Jones (Victoria University of Wellington)

P053 Network structure with link distribution suitable for packet flow
Chiaki Yamaguchi (Department of Computer and Mathematical Sciences, Graduate School of Information Sciences, Tohoku University), Tsuyoshi Horiguchi (Department of Computer and Mathematical Sciences, Graduate School of Information Sciences, Tohoku University)

P054 Large Forecast evaluations for multiple time series: A generalized Theil decomposition
Wolfgang Polasek (Institute of Advanced Studies, Wine, Austria)