The Institute of Statistical Mathematics

ACTIVITY REPORT

2015.4 — 2017.3

Tokyo, Japan

The Institute of Statistical Mathematics

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Tokyo, Japan

October 2017
Center for Engineering and Technical Support
The Institute of Statistical Mathematics
Research Organization of Information and Systems
Inter-University Research Institute Corporation

Contents

Foreword

The Institute of Statistical Mathematics (ISM) has engaged in comprehensive research concerning statistical mathematics for more than 70 years. ISM was established in June 1944 as a research institute under the direct control of the Ministry of Education, Science and Culture. Subsequently, it was reorganized as the National Inter-University Research Institute in 1985, and then in 1989, the Inter-University Research Institute. At the same time, as a result of the establishment of SOKENDAI (Graduate School for Advanced Studies), it participated in graduate school education as one of its foundation bases and became part of the Inter-University Research Institute Corporation Research Organization of Information and Systems (ROIS) in 2004.

The third medium-term plan of ROIS has been in effect since last fiscal year. The educational research evaluation as well as external evaluation on all research activities of ROIS during the second medium-term (from FY2010 to FY2015) plan were completed in 2016. The matters sought for the situation can also change from moment to moment, the role of ISM can be changed as well. We have to deal with such situations with flexibility, however, a strong orientation toward research grounded in reality has been handed down through generations of ISM researchers as a hands-on approach to research for more than 70 years.

As one of the accomplishments of the third medium-term plan and plan for FY2016, ISM reorganized a part of the Basic Research Departments and NOE (Network Of Excellence)-type Research Centers. In addition, ISM has established the "Managing Committee of the School of Statistical Thinking" to examine the future vision of the Project of Fostering and Promoting Statistical Thinking. The main points of management for FY2017 were "Reorganization of the research structure", "Entering the third medium-term plan smoothly", and "Strengthening for the financial base", and we engaged in enthusiastic management of ISM. While we were able to achieve results smoothly as mentioned above, we also left points of reflection. Because of the re-election, my final third term as Director-General will be the two years from FY2017 to FY2018, and I will be responsible for the next directors and the next generation. I'm ready to continuously contribute to the sustainable development of ISM.

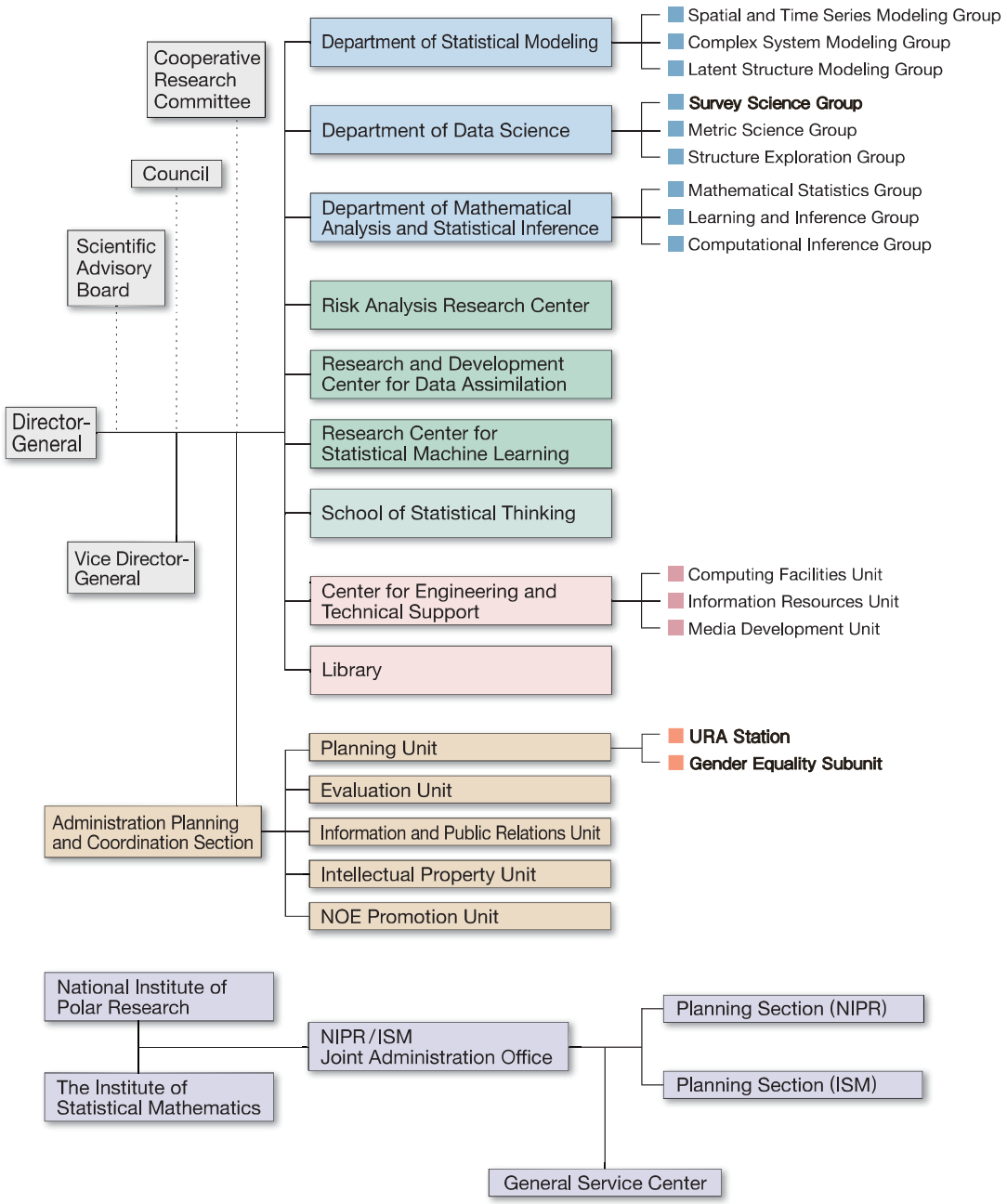
ISM, as the Inter-University Research Institute, set three crucial goals in the

medium and long-term plan for contributing to the intensifying of university facilities; “Strengthening of the Cooperative Research Facility”, “Expansion of the Project for Fostering and Promoting Statistical Thinking” and “Globalization of the research field of Statistical Mathematics”. With these three main points, ISM also promotes the facilitating of Cooperative Research, close cooperation with Industry-Academia and contribution to the area communities. We look forward to your continuing understanding and support for our activities.

Tomoyuki Higuchi
Director-General

October 2017

Organization Diagram (As of April 1, 2017)



1 Organization

Since its foundation as the one and only national institute for statistical science in Japan, the Institute of Statistical Mathematics has continued to exert a prominent influence on the study and research of statistical science. The ever-increasing needs for statistical methods and ideas in various fields of science and technology led the Institute to reorganize itself in 1985 as an inter-university research institute, which puts a major emphasis on research collaboration with all disciplines of science.

In April 2004, the Institute begun a new chapter as a member of the Research Organization of Information and Systems, Inter-University Research Institute Corporation, together with three other institutes, National Institute of Informatics, National Institute of Genetics and National Institute of Polar Research. The new Institute building, which is shared with National Institute of Polar Research and National Institute of Japanese Literature, was built in Tachikawa in March 2009. The institute moved to Tachikawa and started its activities in October 2009.

At present, the Institute consists of three departments, five research centers, a school, a support center, an administration office, a council, and a committee. All Institute activity is guided by the leadership of the Director-General and three Vice Director-Generals. The Council of the Institute of Statistical Mathematics implements any necessary recommendations. The Cooperative Research Committee organizes and facilitates collaborative research projects developed between scholars at the Institute and scientists in other academic agencies.

Three research departments, the Department of Statistical Modeling, the Department of Data Science, and the Department of Mathematical Analysis and Statistical Inference, form the active core of the Institute with its 44 academic staff, carrying out research on either statistical theory or its application to other fields of science and industry. The Department of Statistical Modeling and its three groups study statistical modeling aspects on various fields. In the three groups of the Department of Data Science, efforts are concentrated on data collection and handling. The three groups of the Department of Mathematical

Analysis and Statistical Inference are specifically concerned with fundamental aspects of statistics.

The five strategic research centers, Risk Analysis Research Center, Research and Development Center for Data Assimilation, Survey Science Center, Research Center for Statistical Machine Learning, and Service Science Research Center were established in 2005, 2011, 2011, 2012 and 2012 respectively, as main bodies for establishing Network of Excellence (NOE) and performing project research on specific topics. Risk Analysis Research Center studies many topics related to risk, such as food, drug, clinical trials, suicide, environment, resource management, finance, insurance, earthquake and genome information. Research and Development Center for Data Assimilation conducts research and development of data assimilation techniques such as the ensemble Kalman filter and the particle filter and applies them to a variety of research fields. Survey Science Center carries out survey research of Japanese national character and cross-national comparative studies, and studies techniques of survey research. Research Center for Statistical Machine Learning aims at supporting the research community of the field as an activity of the NOE projects, and producing influential research works by carrying out various research projects with domestic and international collaborations. The Service Science Research Center aimed to bring the data-centric methodologies into service fields such as marketing and supply chain methods. As the Service Science Research Center achieved its original purpose, it was closed down on January 31, 2017. More detailed descriptions of the objectives of each department and center are presented in the next chapter. The information covers research subjects and the interests of staff, which range from the physical sciences and life sciences to the social and cultural sciences.

The School of Statistical Thinking was established in 2012 to perform the project for fostering and promoting statistical thinking. As data produced in various fields of the real world become very large and complex, people who can discover important information buried in such data are strongly required. The Institute has provided several educational courses and supports to disseminate statistical thinking for a long time. The School integrates and expands such activities and is a place to study sta-

tistical thinking.

The Center for Engineering and Technical Support was established in 2006 to help the activities of the Japanese statistical science community by providing adequate computational and informational resources. This center has 11 technical staff that work on special jobs including maintenance of computer systems, editing journals and bibliographical services. The Institute has three supercomputer systems and a library of books and journals, not only in pure statistics, but also in fields of specific interest to researchers (e.g., physics, genetics and social sciences). Lastly, there is also a division of 16 officials who manage general affairs.

The Institute devotes itself to educating young statisticians as well. As a constituent of the Graduate University for Advanced Studies (Department of Statistical Science, School of Multidisciplinary Sciences), the Institute offers graduate programs leading to a Ph.D. degree. (See Supplement on page 101.) (The number of staff mentioned above refer to the full strength on April 1, 2017.)

2 Departments, Centers and Research Staff

Department of Statistical Modeling

The Department of Statistical Modeling works on the modeling of phenomenal structures related to numerous factors, and it conducts research on model-based statistical inference methodologies. By means of the modeling of spatially and/or temporally varying phenomena, complex systems, and latent structures, the department aims to contribute to the development of cross-field modeling intelligence.

■ Spatial and Time Series Modeling Group

The Spatial and Time Series Modeling Group works on the development and evaluation of statistical models, which function effectively in terms of predicting phenomena or scientific discoveries, through data analysis and modeling related to space-time-varying phenomena.

— *Staff* —

Nobuhisa KASHIWAGI, Prof.
Tomoyuki HIGUCHI, Director-General, Prof.
Jiancang ZHUANG, Assoc. Prof.
Genta UENO, Assoc. Prof.
Shin'ya NAKANO, Assist. Prof. (-2016.3.31), Assoc. Prof. (2016.4.1-)

— *Subjects* —

- Methods for prediction and knowledge discovery based on Bayesian model
- Modeling and application of point location and/or spatial structure
- Bayesian multi-dimensional data analysis
- Point process modeling of market data and its application
- Statistical seismology
- Model integration by particle filter

- Statistical analysis and modeling of stochastic point process
- Point process model and its applications to biosciences
- Development of data assimilation system in Earth science
- Environmental data analysis

■ Complex System Modeling Group

The Complex System Modeling Group conducts studies in order to discover the structures of complex systems, such as nonlinear systems and hierarchical networks, through statistical modeling.

— *Staff* —

Yoshiyasu TAMURA, Vice Director-General, Prof.
Junji NAKANO, Director, Prof.
Yukito IBA, Prof.
Michiko WATANABE, Visiting Prof.
Kenichi MIURA, Visiting Prof.
Hiroko NAKANISHI, Visiting Prof.
Hiroshi MARUYAMA, Visiting Prof. (2016.6.1-)
Makoto SHIMIZU, Visiting Prof. (2016.8.1-)
Yumi TAKIZAWA, Assoc. Prof.
Fumikazu MIWAKEICHI, Assoc. Prof.
Shinsuke KOYAMA, Assoc. Prof.
Toru, ONODERA, Visiting Assoc. Prof.
Fumitake SAKAORI, Visiting Assoc. Prof. (2016.4.1-)
Yuji MIZUKAMI, Visiting Assoc. Prof. (2016.6.1-)
Shigeru SAITOU, Visiting Assoc. Prof. (2017.1.1-)
Tarou TAKAGUCHI, Visiting Assoc. Prof. (2017.1.1-)
Ayaka SAKATA, Assist. Prof.

— *Subjects* —

- Non-linear stochastic differential equations and non-linear time series analysis
- Markov chain Monte Carlo/sequential Monte Carlo methods and their applications
- Physical random number generation and evaluation
- Rare event sampling
- Individual and social behavior analysis
- Data and model visualization

- Time series/spatial-temporal analysis for neural data
- Spatial-temporal random event estimation by neural network
- Modeling for intensive data

■ Latent Structure Modeling Group

The Latent Structure Modeling Group works on the modeling of variable factors as latent structures existing behind various dynamic phenomena in the real world, and it conducts research on methodologies for inference computation associated with structures on the basis of data related to phenomena.

— *Staff* —

Hiroshi MARUYAMA, Prof. (-2016.3.31)
Tomoko MATSUI, Prof.
Yoshinori KAWASAKI, Prof.
Ryo YOSHIDA, Assoc. Prof.
Kazuhiro MINAMI, Assoc. Prof.
Satoshi TAMAMORI, Project Assist. Prof. (2015.8.1-2016.3.31)

— *Subjects* —

- Hidden variable modeling with smoothing prior
- Estimation and application of regularized non-linear models
- Data structure learning using kernel methods
- Modeling and simulation for biological control system
- Multi-dimensional modeling for social behavior
- Inverse problem solution using hierarchical Bayesian inference
- Requirement definition in modeling for life cycle
- Model evaluation by information criteria
- Estimation of latent structure for speech, musical and image data based on machine learning

Department of Data Science

The aim of the Department of Data Science is to contribute to the development of natural and social sciences by conducting research into the methodology of designing statistical data collection systems, measuring and analyzing complex phenomena for evidence-based sciences, and performing exploratory multivariate data analyses.

■Data Design Group (-2017.1.31), Survey Science Group (2017.2.1-)

The Survey Science Group focuses on research toward designing statistical data collection systems and developing the related data analysis methods in a variety of survey and experimental environments.

— *Staff* —

Takashi NAKAMURA, Prof.
Ryozo YOSHINO, Prof.
Takahiro TSUCHIYA, Assoc. Prof. (-2016.3.31), Prof. (2016.4.1-)
Takatoshi IMADA, Visiting Prof.
Toru KIKKAWA, Visiting Prof. (2017.1.1-)
Yoshimichi SATO, Visiting Prof. (2017.1.1-)
Masato YONEDA, Visiting Prof. (2017.1.1-)
Shintaro SONO, Visinting Prof. (2017.1.1-)
Kazufumi MANABE, Visiting Prof. (2017.1.1-)
Fumi HAYASHI, Visitng Prof. (2017.1.1-)
Masahiro MIZUTA, Visinting Prof. (2017.1.1-)
Naomasa MARUYAMA, Assoc. Prof. (-2017.1.31)
Tadahiko MAEDA, Assoc. Prof.
Takahito ABE, Visiting Assoc. Prof. (2017.1.1-)
Wataru MATSUMOTO, Visiting Assoc. Prof. (2017.1.1-)
Koken OZAKI, Visiting Assoc. Prof. (2017.1.1-)
Tadayoshi FUSHIKI, Visiting Assoc. Prof. (2017.1.1-)
Hiroko TSUNODA, Visiting Assoc. Prof. (2017.1.1-)
Taisuke FUJITA, Visiting Assoc. Prof. (2017.1.1-)
Saeko KIKUZAWA, Visiting Assoc. Prof. (2017.1.1-)
Masayo HIROSE, Assist. Prof. (2015.6.1-)
Yoo Sung PARK, Assist. Prof. (2017.2.1-)
Yusuke INAGAKI, Project Assist. Prof.
Kiyohisa SHIBAI, Project Assist. Prof.

— *Subjects* —

- Social research methods and data analysis
- Cohort analysis of repeated social research data
- Data science for Behaviormetric study of civilizations
- Theory and applications of latent variable models
- Research on nonsampling errors in surveys
- Analysis of longitudinal and repeated cross-sectional surveys

- Statistical research on the Japanese national character
- Sampling theory and its applications
- Methodology of cross-national comparative survey
- Development of indirect questioning techniques
- Statistical quality control
- Decoding of algebraic geometric codes
- Methodology for collecting and publishing information relating to statistical science
- Small area inference and its application
- Theory and applications of multilevel modeling
- Development of statistical method on organizational behavior

■ Metric Science Group

The Metric Science Group studies methods for measuring and analyzing complex phenomena to extract statistical evidence behind them in the various fields of science.

— *Staff* —

Satoshi YAMASHITA, Director, Prof.
Kenichiro SHIMATANI, Assoc. Prof.
Masayuki HENMI, Assoc. Prof.
Ikuko FUNATOGAWA, Assoc. Prof.
Hisashi NOMA, Assist. Prof. (-2016.3.31), Assoc. Prof. (2016.4.1-)
Nobuo SHIMIZU, Assist. Prof.

— *Subjects* —

- Evaluation methodology for financial statistic models
- Valuation of market risk and credit risk
- Statistical analysis in clinical trials of pharmaceutical drugs
- Design and analysis of clinical studies for personalized medicine
- Methodology of clinical researches for developing predictive medicine
- Methodology of study designs and statistical methods for epidemiologic researches
- Theory of semiparametric inference and its application
- Foundation of meta-analysis and its application
- Design for long-term ecological study
- Missing data analysis
- Symbolic data analysis

・ Functional data analysis

■ Structure Exploration Group

The Structure Exploration Group advances statistical and mathematical research by applying or developing exploratory multivariate data analyses to clarify latent structures of real phenomena in various fields of both natural and social sciences.

— *Staff* —

Koji KANEFUJI, Vice Director-General, Prof.
Manabu KUROKI, Assoc. Prof. (-2016.3.31), Prof. (2016.4.1-)
Jun ADACHI, Assoc. Prof.
Naomasa MARUYAMA, Assoc. Prof. (2017.2.1-)
Yoo Sung PARK, Assist. Prof. (-2017.1.31)

— *Subjects* —

- Statistical methods to establish environment standards
- Reliability theory based on life-span models
- Environmental statistics
- Causal data analysis for advanced business modeling
- Statistical causal inference
- Graphical modeling
- Modeling of molecular evolution
- Maximum likelihood inference of molecular phylogeny
- Comparative analysis of genome structure
- Theoretical biology and bioinformatics
- Analysis of educational and psychological assessment data
- Latent variable models for social sciences
- Theory and applications of multilevel modeling
- Longitudinal data analysis
- Organizational behavior based on multilevel analysis
- Statistical quality control
- Decoding of algebraic geometric codes
- Development of statistical method on organizational behavior

Department of Mathematical Analysis and Statistical Inference

The Department of Mathematical Analysis and Statistical Inference carries out research into general theory of mathematical statistics, statistical learning theory, optimization, and algorithms in statistical inference.

■ Mathematical Statistics Group

The Mathematical Statistics Group is concerned with aspects of statistical inference theory, modeling of uncertain phenomena, stochastic processes and their applications to inference, probability and distribution theory, and related mathematics.

— *Staff* —

Satoshi KURIKI, Director, Prof.
Akimichi TAKEMURA, Visiting Prof. (2016.4.1-)
Shuhei MANO, Assoc. Prof.
Shogo KATO, Assoc. Prof.
Takaaki SHIMURA, Assist. Prof.
Kei KOBAYASHI, Assist. Prof. (-2016.3.31)
Teppei OGIHARA, Assist. Prof.

— *Subjects* —

- Statistical inference and statistical decisions
- Analysis of multivariate data and contingency tables
- Integral-geometric approach to random field theory
- Multiple comparisons
- Statistical inference based on graphical models
- Additive processes
- Heavy-tailed distributions
- Algebraic statistics
- Directional statistics
- Stochastic modeling of data with combinatorial structures
- Extreme value theory

■ Learning and Inference Group

The Learning and Inference Group develops statistical methodologies to describe the stochastic structure of data mathematically and clarify the potential and the limitations of the data theoretically.

— *Staff* —

Shinto EGUCHI, Prof.
Kenji FUKUMIZU, Prof.
Hironori FUJISAWA, Prof.
Shiro IKEDA, Assoc. Prof. (-2016.3.31), Prof. (2016.4.1-)
Ryuei NISHII, Visiting Prof. (-2016.3.31)
Daichi MOCHIHASHI, Assoc. Prof.
Shuichi KAWANO, Visiting Assoc. Prof. (2016.4.1-)
Yoshiyuki NINOMIYA, Visiting Assoc. Prof. (-2016.3.31)
Osamu KOMORI, Project Assist. Prof. (-2015.9.30)

— *Subjects* —

- Statistical learning theory
- Information geometry
- Robust statistics
- Statistical inference for observational studies
- Theory of multivariate distributions and its application
- Bioinformatics
- Stochastic inference
- Genome statistics
- Statistical inference based on positive semidefinite kernel
- Approximation theory on graph
- Statistical singular model
- Statistical natural language processing
- Statistical methods of topological data analysis
- Sparse modeling

■ Computational Inference Group

The Computational Inference Group studies mathematical methodologies in the research fields of numerical analysis, optimization, discrete mathematics, control and systems theory for computation-based statistical inference as well as their applications.

— *Staff* —

Satoshi ITO, Vice Director-General, Prof.
Yoshihiko MIYASATO, Prof.
Atsushi YOSHIMOTO, Prof.
Akiko TAKEDA, Prof. (2016.4.1-)

— *Subjects* —

- Algorithms for computational inference
- Optimization modeling in computational inference
- Systems design under uncertainty
- Nonlinear H∞ control based on inverse optimality
- Adaptive gain-scheduled control
- Mathematics and computational complexity analysis of convex programming
- Theory and computational methods of optimization
- Iterative learning control
- Computational algorithms for state-space modeling
- Analysis of social system
- Optimization in natural resource controlling problem
- Control of multi-agent system

Risk Analysis Research Center

Risk Analysis Research Center is pursuing a scientific approach to uncertainties and risks in human society, which have increased with the growing globalization. Also, the center is constructing an academic network for the risk analysis and research with the goal of contributing to create a reliable and safe society.

■ Data Infrastructure for Risk Analysis

To generate data-centric risk sciences this group will construct data bases for risk analysis by collecting relevant data and their linkage. The project will further investigate quality management of risk data and supply secured and efficient data editing environment to researchers where they can analyze well anonymized individual information safely.

— *Staff* —

Satoshi YAMASHITA, Director, Prof.
Sadaaki MIYAMOTO, Visiting Prof.
Kouji OKUHARA, Visiting Assoc. Prof. (-2016.3.31)
Hideki KATAGIRI, Visiting Assoc. Prof. (-2016.3.31)
Masakazu FURUKAWA, Visiting Assoc. Prof. (-2016.3.31)
Ryota NAKAMURA, Visiting Assoc. Prof. (-2016.3.31)

Hitoshi MOTOYAMA, Visiting Assoc. Prof. (2015.7.1-)

■ Mathematical Analysis of Risk

To quantify the risk factors such as natural disasters, severe diseases and accidents, we need to formalize their stochastic behaviors, and make statistical inferences based on their tail distributions. As such, we study the extreme value theory, copula model and multiple comparisons from the mathematical and computational viewpoints. To promote the activity of this research community, we organize the annual cooperative research symposiums "Extreme value theory and applications" (since 1994) and "Infinitely divisible processes and related topics" (since 1992), and other occasional international symposiums.

— *Staff* —

Satoshi KURIKI, Prof.
Rinya TAKAHASHI, Visiting Prof.
Yo SHIINA, Visiting Prof.
Toshinao YOSHIBA, Visiting Prof. (2016.4.1-)
Shogo KATO, Assoc. Prof.
Toshikazu KITANO, Visiting Assoc. Prof.
Hisayuki HARA, Visiting Assoc. Prof.
Masao UEKI, Visiting Assoc. Prof. (2016.11.1-)
Takaaki SHIMURA, Assist. Prof.

■ Medical Care and Health Science Project

This project consists of the following three subprojects. In the first one, we aim to develop the statistical framework and methodology of quantitative risk evaluation for substances ingested by the human body. In the second one, we construct theoretical schemes for clinical trial designs toward predictive medicine and develop effective statistical methods for developing and validating predictive biomarkers for treatment efficacy and adverse reactions and for evaluating risk and benefit of treatment based on predictive biomarkers in premarketing and postmarketing clinical trials. In the third one, we clarify effective suicide prevention and mental health care through discussion with experts of mental health and application of spatio-temporal data analysis and causal modeling of various data which may affect mental health.

— *Staff* —

Shinto EGUCHI, Prof.
Manabu KUROKI, Vice Director, Assoc. Prof. (-2016.3.31), Prof. (2016.4.1-)
Manabu IWASAKI, Visiting Prof.
Yoichi KATO, Visiting Prof. (-2016.3.31)
Tosiya SATO, Visiting Prof.
Masaaki MATSUURA, Visiting Prof. (-2016.3.31)
Shigeyuki MATSUI, Visiting Prof.
Satoshi TERAMUKAI, Visiting Prof.
Tatsuhiko TSUNODA, Visiting Prof.
Shusaku TSUMOTO, Visiting Prof. (2016.6.1-)
Masayuki HENMI, Assoc. Prof.
Fumikazu MIWAKEICHI, Assoc. Prof.
Ikuko FUNATOGAWA, Assoc. Prof.
Hisashi NOMA, Assist. Prof. (-2016.3.31), Assoc. Prof. (2016.4.1-)
Masakazu FURUKAWA, Visiting Assoc. Prof. (2016.5.1-)
Kazushi MARUO, Visiting Assoc. Prof. (2016.4.1-)
Ryota NAKAMURA, Visiting Assoc. Prof. (2016.5.1-)
Toshihiko KAWAMURA, Visiting Assoc. Prof. (2016.6.1-)
Haruhisa FUKUDA, Visiting Assoc. Prof. (2016.6.1-)
Toshio OHNISHI, Visiting Assoc. Prof. (-2016.3.31)
Hisateru TACHIMORI, Visiting Assoc. Prof.
Makoto TOMITA, Visiting Assoc. Prof.
Takafumi KUBOTA, Visiting Assoc. Prof.
Yoshitake TAKEBAYASHI, Project Assist. Prof.(-2016.8.31)
Takahiro OTANI, Project Assist. Prof. (2015.12.1-)

■ Environmental Statistics Project

We are developing a statistical analysis method which is the foundation for environmental risk assessment in water, atmosphere and soil, and environmental monitoring. In addition, the group is closely related to the community in the environmental science field. We aim to provide quantitative analysis methods and evaluation methods for various problems related to the global environment.

— *Staff* —

Koji KANEFUJI, Vice-Director General, Prof.
Nobuhisa KASHIWAGI, Prof.
Mihoko MINAMI, Visiting Prof.

Satoshi TAKIZAWA, Visiting Prof.
Osamu NAGAFUCHI, Visiting Prof. (-2016.3.31)
Toshihiro HORIGUCHI, Visiting Prof.
Naoki SAKAI, Visiting Prof.
Megu OHTAKI, Visiting Prof. (-2016.3.31)
Kenichiro SHIMATANI, Assoc. Prof.
Takashi KAMEYA, Visiting Assoc. Prof.
Tomoaki IMOTO, Project Assist. Prof. (-2016.3.31)

■ Risk Analysis for Resource Management Project

Our research focuses on mathematical modeling for prediction and control of natural and socio-economic resource change within deterministic and stochastic frameworks. Through field survey, we conduct research on sustainable renewable resource management as a socio-economic system. One of our current projects concerns risk evaluation and economic analysis of sustainable forest and ecosystem management.

— *Staff* —

Atsushi YOSHIMOTO, Prof.
Yasuhiro KUBOTA, Visiting Assoc. Prof. (-2016.3.31), Visiting Prof. (2016.4.1-)
Yumi TAKIZAWA, Assoc. Prof. (2015.11.1-)
Kenichi KAMO, Visiting Assoc. Prof.
Masashi KONOSHIMA, Visiting Assoc. Prof.
Katsuya TANAKA, Visiting Assoc. Prof. (-2016.3.31)
Shizu ITAKA, Project Assist. Prof. (2015.12.1-)

■ The project of risk evaluation, risk control and risk management for finance and insurance

The aims of this project are to develop the methodology of risk evaluation, risk control and risk management, focusing to financial market data, credit risk data and macro-economic data. To use research results for society, we manage the network between academic researchers and business people who work in bank, insurance company and pablic sector.

— *Staff* —

Satoshi YAMASHITA, Director, Prof.
Yoshinori KAWASAKI, Prof.
Naoto KUNITOMO, Visiting Prof.

Hiroshi TSUDA, Visiting Prof.
Toshio HONDA, Visiting Prof.
Michiko MIYAMOTO, Visiting Prof.
Toshinao YOSHIBA, Visiting Prof. (-2016.3.31)
Tadashi ONO, Visiting Prof.
Hideatsu TSUKAHARA, Visiting Prof. (2015.5.1-)
Satoshi FUJII, Visiting Prof. (2016.4.1-)
Takaaki YOSHINO, Visiting Prof. (2016.4.1-)
Yoichi NISHIYAMA, Visiting Assoc. Prof. (2015.7.1-2016.3.31), Visiting Prof. (2016.4.1-)
Nakahiro YOSHIDA, Visiting Prof.
Masakazu ANDO, Visiting Assoc. Prof. (-2016.7.31), Visiting Prof. (2016.8.1-)
Yasutaka SHIMIZU, Visiting Assoc. Prof. (-2016.3.31, 2016.5.1-)
Masaaki FUKASAWA, Visiting Assoc. Prof. (-2016.3.31, 2016.5.1-)
Seisho SATO, Visiting Assoc. Prof.
Yukihiko OKADA, Visiting Assoc. Prof. (2016.6.1-)
Teppei OGIHARA, Assist. Prof.
Hayafumi WATANABE, Project Assist. Prof. (2016.1.1-)
Yuta KOIKE, Project Assist. Prof. (2015.8.1-2016.3.31)

■ Statistical Seismological Research Project

The statistical seismological research group develops statistical models for quantitative analysis of earthquake occurrence and the relation between seismicity and other phenomena from geophysical or geochemical observations, techniques of probabilistic earthquake forecasting, and methods for evaluating forecasting performance. More general types of random events in time and/or space, such as fires, crimes, etc., are also studied, especially, the construction of forecasting models based on our understanding of the mechanisms of these phenomena, as well as their statistical inferences. This group also researches various applicational seismological topics such as earthquake early warning and earthquake insurance.

— *Staff* —

Jiancang ZHUANG, Assoc. Prof.
Bogdan Dumitru ENESCU, Visiting Assoc. Prof.
Takaki IWATA, Visiting Assoc. Prof.
Agnes HELMESTTETER, Visiting Assoc. Prof. (2016.9.26-2016.10.28)
Matthew GERSTENBERGER, Visiting Assoc. Prof. (2015.7.1-2016.3.31)
Takao KUMAZAWA, Project Assist. Prof. (2016.7.1-)

Research and Development Center for Data Assimilation

Data assimilation is a fundamental technique that constructs precise and predictable models by combining numerical simulations and observational/experimental data. Research and Development Center for Data Assimilation studies fundamental methodology of data assimilation based on Bayesian statistics, implements numerical algorithms on high-performance computer systems in order to deal with large-scale problems, and promotes data assimilation to various fields of sciences.

— *Staff* —

Tomoyuki HIGUCHI, Director-General, Director, Prof.
Yoshiyasu TAMURA, Vice Director-General, Vice Director, Prof.
Junji NAKANO, Prof.
Yukito IBA, Prof.
Takashi WASHIO, Visiting Prof.
Shinichi OHTANI, Visiting Prof.
Yoichi MOTOMURA, Visiting Prof. (2016.6.1-)
Nobuhiko TERUI, Visiting Prof. (2016.6.1-)
Tadahiko SATO, Visiting Prof. (2016.6.1-)
Genta UENO, Assoc. Prof.
Ryo YOSHIDA, Assoc. Prof.
Shinya NAKANO, Assist. Prof. (-2016.3.31), Assoc. Prof. (2016.4.1-)
Masaya SAITO, Project Assist. Prof. (2015.10.1-)
Kazuyuki NAKAMURA, Visiting Assoc. Prof.
Hiromichi NAGAO, Visiting Assoc. Prof.
Hiroshi KATO, Visiting Assoc. Prof.
Osamu HIROSE, Visiting Assoc. Prof.
Hiroshi YAMASHITA, Visiting Assoc. Prof.
Hiroshi FUJISAKI, Visiting Assoc. Prof. (2015.10.1-)
Tsukasa ISHIGAKI, Visiting Assoc. Prof. (2016.6.1-)
Eiji MOTOHASHI, Visiting Assoc. Prof. (2016.6.1-)
Stephen WU, Project Assist. Prof. (2016.4.1-)
Guillaume LAMBARD, Project Assist. Prof. (2016.5.1-)

— *Subjects* —

- Research of sequential Monte Carlo methods, nonlinear filtering and visualization of ultrahigh dimensional data

- Development of new algorithms that generate random numbers with ultrahigh speed and quality by combining pseudo and hardware random numbers
- Application of data assimilation to practical problems in various fields of sciences such as space, earth and life sciences
- Development of next-generation industrial science geared towards highly-accurate simulations and highly-sensitive sensors
- Development of advanced Monte Carlo algorithms and its applications
- Implementation of statistical analysis systems in high performance computing and cloud computing environments
- Establishment of a cooperative network that consists of institutes and universities associated with numerical simulations

Survey Science Center (-2017.1.31)

Founded on the accomplishments in social research by the Institute of Statistical Mathematics spanning over half a century including the Study of the Japanese National Character and the cross-national comparative research on national characteristics, the Survey Science Center was established in January of 2011 in order to facilitate further growth of the aforementioned sets of research as well as the establishment of networking ties with both domestic and international research organizations and the increase in the capacity to make contributions to wider society by creating what we call the NOE (Network Of Excellence).

— *Staff* —

Ryozo YOSHINO, Director, Prof.
Takashi NAKAMURA, Prof.
Takahiro TSUCHIYA, Assoc. Prof. (-2016.3.31), Prof. (2016.4.1-)
Toru KIKKAWA, Visiting Prof.
Yoshimichi SATO, Visiting Prof.
Masato YONEDA, Visiting Prof.
Shintaro SONO, Visinting Prof.
Kazufumi MANABE, Visinting Prof.
Fumi HAYASHI, Visitng Prof.
Masahiro MIZUTA, Visinting Prof.
Saeko KIKUZAWA, Visiting Prof. (2016.4.1-)

Tadahiko MAEDA, Assoc. Prof.
Takahito ABE, Visiting Assoc. Prof.
Wataru MATSUMOTO, Visiting Assoc. Prof.
Koken OZAKI, Visiting Assoc. Prof.
Tadayoshi FUSHIKI, Visiting Assoc. Prof.
Hiroko TSUNODA, Visiting Assoc. Prof.
Taisuke FUJITA, Visiting Assoc. Prof.
Yoo Sung PARK, Assist. Prof.
Yusuke INAGAKI, Project Assist. Prof.
Kiyohisa SHIBAI, Project Assist. Prof. (2016.1.1-)

■ The Study of the Japanese National Character (JNC)
The longitudinal nationwide survey has been carried out since 1953 every 5 years with the purpose of clarifying the Japanese national character. This study shows some stable aspects such as human relationships in Japan, as well as some other aspects changing over years with the changes of economic, political and social conditions.

■ The Cross-National Studies of the National Character
The JNC survey has been developed into the cross-national comparative surveys which include the people with Japanese ancestry overseas since 1971. This study attempts to understand the Japanese people and their culture in the comparative context as well as the global configuration of psychological distances of many countries (a sort of cultural manifold).

■ The Project on Accumulating Information on Social Research
Many data sets of our past surveys in various fields have been accumulated. These are being organized as a database open to researchers in the ISM collaboration studies, and to public eventually.

■ The Project on Collaborative Survey Research
In collaborations with universities or institutes, we carry out survey research on various topics. We expect many young researchers to experience practical surveys through our efforts, including statistical sampling, data-cleaning and data analyses.

■ The Project on Utilizing Information on Social Research
Under our paradigm “Science of Data”, we study practical and scientific ways

to utilize survey data and develop new statistical methods and techniques to collect and analyze survey data.

Research Center for Statistical Machine Learning

The Research Center for Statistical Machine Learning started in January 2012, aiming at taking charge of advancing the "Statistical Machine Learning NOE", one of the Network Of Excellence Establishing Projects, and at being a central research organization in the field of statistical machine learning. The center is carrying out various research projects in the machine learning, as well as contributing the research community through organizing and supporting workshops and seminars for the developing this research field.

— *Staff* —

Kenji FUKUMIZU, Director, Prof.
Tomoko MATSUI, Vice Director, Prof.
Shinto EGUCHI, Prof.
Yoshihiko MIYASATO, Prof.
Satoshi ITO, Vice-Director General, Prof.
Shiro IKEDA, Assoc. Prof. (-2016.3.31), Prof. (2016.4.1-)
Satoshi KURIKI, Prof. (2016.4.1-)
Akiko TAKEDA, Prof. (2016.5.1-)
Hironori FUJISAWA, Prof. (2017.2.1-)
Takashi TSUCHIYA, Visiting Prof.
Masataka GOTO, Visiting Prof.
Koji TSUDA, Visiting Prof. (-2016.3.31)
Hiroshi KURATA, Visiting Prof. (2015.10.1-2016.3.31, 2016.6.1-)
Katsuki FUJISAWA, Visiting Prof. (2016.4.1-)
Yoshiki YAMAGATA, Visiting Prof. (2016.4.1-)
Daichi MOCHIHASHI, Assoc. Prof.
Shinsuke KOYAMA, Assoc. Prof.
Kazuhiro MINAMI, Assoc. Prof. (2016.4.1-)
Yuji SHINANO, Visiting Assoc. Prof.
Arthur GRETTON, Visiting Assoc. Prof.
Shaogao LU, Visiting Assoc. Prof. (-2016.3.31)
Ruriko YOSHIDA, Visiting Assoc. Prof. (2015.6.1-2016.3.31)
Hiroshi SOMEYA, Visiting Assoc. Prof. (2017.1.1-)

Kei KOBAYASHI, Assist. Prof. (-2016.3.31)
Song LIU, Project Assist. Prof.
Mikio MORII, Project Assist. Prof. (2016.4.1-)
Takashi ARAI, Project Assist. Prof. (2016.4.1-)

Service Science Research Center (-2017.1.31)

Very few scientific methodologies have been developed for and applied to service activities, whereas businesses of the service sector produce more than three quarters of the developed world's economy today. Our Service Science Research Center brings the data-centric methodologies into the service fields — from marketing, supply chain management, management engineering, to modeling of social systems. In order to integrate diverse disciplines, we connect researchers in various fields through collaborations with universities nationwide, under our project of the Network-Of-Excellence (NOE) for service science.

— *Staff* —

Hiroshi MARUYAMA, Director (-2016.3.31), Prof. (-2016.3.31), Visiting Prof. (2016.6.1-)
Junji NAKANO, Director (2016.4.1-), Prof.
Tomoyuki HIGUCHI, Director-General, Prof.
Tomoko MATSUI, Prof.
Manabu KUROKI, Assoc. Prof. (-2016.3.31), Prof. (2016.4.1-)
Yoichi MOTOMURA, Visiting Prof.
Shusaku TSUMOTO, Visiting Prof.
Nobuhiko TERUI, Visiting Prof.
Tadahiko SATO, Visiting Prof.
Yoshiki YAMAGATA, Visiting Prof. (-2016.3.31)
Kazuhiro MINAMI, Assoc. Prof.
Tsukasa ISHIGAKI, Visiting Assoc. Prof.
Yukihiko OKADA, Visiting Assoc. Prof.
Eiji MOTOHASHI, Visiting Assoc. Prof.
Toshihiko KAWAMURA, Visiting Assoc. Prof.
Haruhisa FUKUDA, Visiting Assoc. Prof.
Nobuo SHIMIZU, Assist. Prof.

■ Project on Quality Assurance and Reliability of Products and Services
We study the statistical methods that have been developed for quality management of products and apply them to services to realize reliability and safety of services.

■ Project on Bayesian Analysis of Marketing Data
We apply the statistical methods such as Bayesian network to large-scale marketing data so that enterprises and the society at large have more detailed and personalized marketing data and predicts their clients' demands.

■ Project on Resilient Society
We investigate general strategies for making complex systems (such as societies) resilient and prove their effectiveness through building multi-domain agent simulator for a city.

■ Project on Building Social Behavior Model
We build an integrated model of collective human behavior by integrating existing models in various domains such as economics, disaster management, transportation, finance and marketing. This model will enable us to do more reliable predictions of collective human behaviors and could be used for planning in various purposes.

■ Project on Analyzing Structure of Services Industry
We develop a suite of methods to analyze the large-scale and diverse source of data and visualize them. This will enable obtaining insights on the overall structure of the services industry and will lead to efficiency improvement and higher rate of innovation.

■ Project on Data Curation
Data need to be prepared, such as removing outliers, supplying missing values, adjusting units, merging, splitting, coding, etc. for useful analytics. This project aims at developing an organized body of knowledge for this important process for data analysis.

■ Project on Data Scientist Traning
We investigate the current status and best practicies of training data scientists, who can analyze data and translate its results into business values.

■ Project on Privacy-Preserving Data Publishing
How to share data while preserving privacy is a big issue. We apply innovative approach in publishing location data without violating certain privacy criteria.

URA (University Research Administrator)

ISM assigned URA in the Administration Planning and Coordination Section for promoting and strengthening joint research in mathematical statistics.

— *Roles of URA* —

- Promotion for research collaborations and interchanges with universities and research institutions
- Support for design and planning of ISM research strategy
- Promotion for utilizations of ISM supercomputer systems
- Pre-awards and post-awards
- Public-relations and outreach

School of Statistical Thinking

The School of Statistical Thinking was established as a center for the planning and implementation of various programs for professional development and education and training in statistical thinking. In the setting of a joint research facility, the school is working to develop professionals (specialists with broad knowledge and skills, modelers, research coordinators, etc.) equipped with the statistical thinking ability to meet the demands of the "big data era", in which large-scale data sets are utilized for modeling, research coordination, and other applications.

— *Staff* —

Yoshinori KAWASAKI, Director
Jun ADACHI, Vice Director (-2016.12.1)
Genta UENO, Vice Director (2016.12.1-)
Hiroshi MARUYAMA, Prof. (-2016.3.31)
Satoshi ITO, Prof.
Yukito IBA, Prof.

Nobuhisa KASHIWAGI, Prof. (2016.4.1-)
Yasumasa BABA, Adjunct Prof. (-2016.3.31)
Makio ISHIGURO, Adjunct Prof.
Kunio SHIMIZU, Adjunct Prof.
Naomasa MARUYAMA, Assoc. Prof.
Kenichiro SHIMATANI, Assoc. Prof. (2016.9.1-)
Masayuki HENMI, Assoc. Prof. (2016.12.1-)
Kei TAKAHASHI, Project Assist. Prof. (-2016.3.31), Visiting Assoc. Prof. (2016.4.1-)
Osamu KOMORI, Visiting Assoc. Prof. (2016.4.1-)
Teppei OGIHARA, Assist. Prof. (-2016.3.31)
Ayaka SAKATA, Assist. Prof. (-2016.3.31)
Masayo HIROSE, Assist. Prof. (2015.6.1-2016.3.31)
Keiichi FUKAYA, Project Assist. Prof. (-2016.3.31)
Kaname MATSUE, Project Assist. Prof. (-2016.9.30)
Toshiya KAZAMA, Project Assist. Prof. (-2016.3.31)
Naoki KAMIYA, Project Assist. Prof. (2016.8.1-)
Kotaro KAGAWA, Project Assist. Prof. (2016.4.1-)
Shogo MIZUTAKA, Project Assist. Prof. (2016.4.1-)

— *Activities* —

- Open lecture for public: Free and introductory lecture concerning statistical science, once a year in November
- Tutorial courses: Pay courses for various topics in statistical science, about 13 times a year
- Graduate school linkage program: Courses and/or guidances at collaborative graduate schools
- Special collaboration with research students: Guidance given in ISM to graduate students belonging to other universities
- Summer graduate Seminar: Free open lecture for graduate students, once a year in summer
- Open-type professional development program: Support for research meetings and workshops for promoting statistical thinking
- Statistical mathematics seminar: Seminars on new research results by researchers in ISM, once a week on Wednesday afternoon
- Research collaboration start-up: Advises and supports given by researchers in ISM for problems of various fields concerning statistical mathematics
- Researcher exchange promotion program: Support to university re-

searchers who use sabbatical system and study at ISM
- Statistical training for school teachers: Training for school teachers to increase their leadership of statistical thinking

Center for Engineering and Technical Support

The Center for Engineering and Technical Support assists the development of statistical science by managing the computer systems used for statistical computing, facilitating public outreach, and supporting the research activities of both staff and collaborators.

— *Staff* —

Yoshinori KAWASAKI, Director, Prof.
Jun ADACHI, Vice Director, Assoc. Prof.

■ Computing Facility Unit

The Computing Facility Unit is in charge of the management of computer facilities, software and networking infrastructure used for research and is responsible for network security.

■ Information Resources Unit

The Information Resources Unit is in charge of the management of the system for disseminating research results and an extensive library and is responsible for planning statistical education courses.

■ Media Development Unit

The Media Development Unit is in charge of the publication and editing of research results and is responsible for public relations.

Project Researchers

Project researchers is the all-inclusive term for post-doctoral researchers participating in specific projects. To name a few, ISM NOE (Network Of Excellence) projects, ROIS TRIC (Transdisciplinary Research Integration Center) projects, government-commissioned projects, and the projects funded by independent agencies like JST.

Ames, Matthew Christopher	Koike, Yuta	Shibai, Kiyohisa
Arai, Takashi	Komori, Osamu	Shibuya, Kazuhiko
Ariyoshi, Yuya	Kumazawa, Takao	Sugasawa, Shonosuke
Fukaya, Keiichi	Lambard, Guillaume	Suzuki, Ikumi
Guo, Zhongliang	Legaspi, Roberto Sebastian	Suzuki, Kazue
Hamada, Hiroka	Liu, Song	Takahashi, Kei
Han, Peng	Matsue, Kaname	Takebayashi, Yoshitake
Imoto, Tomoaki	Miwa, Noriko	Tamamori, Akira
Inagaki, Yusuke	Mizutaka, Shogo	Tanjo, Tomoya
Itaka, Shizu	Morii, Mikio	Wang, Min-zhen
Kagawa, Kotaro	Nagahata, Hideaki	Watanabe, Hayafumi
Kamiya, Naoki	Nikaido, Kosuke	Wu, Stephen
Kanagawa, Motonobu	Nomura, Ryosuke	Yoneoka, Daisuke
Kawamori, Ai	Otani, Takahiro	
Kazama, Toshiya	Saito, Masaya	

Visiting Professors

To push forward the frontiers of interaction between statistics and other fields of science, the Institute provides positions for visiting professors.

Each of the Institute's three departments and five centers have invited foreign and Japanese professors from universities and institutes as shown in the list below.

— *Foreign Visiting Professors* —

Gretton, Arthur	(U.K.)	2015. 4. 1 – 2017. 3.31
Lu, Shaogao	(China)	2015. 4. 1 – 2016. 3.31
Shi, Ningzhong	(China)	2015. 5.18 – 2015. 6.12
Synodinos, Nicolaos Emmanuel	(U.S.A.)	2015. 6. 1 – 2015. 7.31
Yoshida,Ruriko	(U.S.A.)	2015. 6. 1 – 2016. 3.31
Ibid.	(U.S.A.)	2016. 6. 2 – 2016. 7. 1
Richards, Donald ST. P.	(U.S.A.)	2015. 6.25 – 2015. 8. 6
Gerstenberger, Matthew	(New Zealand)	2015. 7. 1 – 2016. 3.31
Peters, Gareth William	(U.K.)	2015. 7. 1 – 2015. 9.29
Ibid.	(U.K.)	2016. 7.19 – 2016. 9.23
Septier, François Jean Michel	(France)	2015. 7. 1 – 2015. 7.31
Ibid.	(France)	2016. 7.11 – 2016. 8. 4

Wynn, Henry Philip	(U.K.)	2015. 7. 3 – 2015. 7.17
Myrvoll, Tor Andre	(Norway)	2015. 7. 6 – 2015. 7.31
Ibid.	(Norway)	2016. 7.11 – 2016. 8. 5
Doucet, Arnaud	(U.K.)	2015. 7.24 – 2015. 8.14
Ibid.	(U.K.)	2016. 7.15 – 2016. 8. 5
Surovy, Peter	(Czech Republic)	2015.10. 2 – 2015.10.31
Ibid.	(Czech Republic)	2016.10.14 – 2016.11. 4
Pedroso, Joao Pedro	(Portuguese)	2015.12. 1 – 2015.12.31
Van de Velden, Michel	(Netherlands)	2016. 5.16 – 2016. 7.29
Shcherbakov, Robert	(Canada)	2016. 6.16 – 2016. 7.14
Wüthrich, Mario Valentin	(Swiss)	2016. 7.14 – 2016. 8.12
Hwang, Hsien-Kuei	(Taiwan)	2016. 7.26 – 2016. 8.23
Helmstteter, Agnes	(France)	2016. 9.26 – 2016.10.28
Drton, Mathias	(U.S.A.)	2017. 1. 5 – 2017. 3.22

— *Japanese Visiting Professors* —

Abe, Takahito	2015. 4. 1 - 2017. 3.31	Kato, Hiroshi	2015. 4. 1 - 2017. 3.31
Ando, Masakazu	2015. 4. 1 - 2017. 3.31	Kato, Yoichi	2015. 4. 1 - 2016. 3.31
Enescu, Bogdan Dumitru	2015. 4. 1 - 2017. 3.31	Kawamura, Toshihiko	2015. 4. 1 - 2017. 3.31
Fujita, Taisuke	2015. 4. 1 - 2017. 3.31	Kikkawa, Toru	2015. 4. 1 - 2017. 3.31
Fukasawa, Masaaki	2015. 4. 1 - 2016. 3.31	Kitano, Toshikazu	2015. 4. 1 - 2017. 3.31
Ibid.	2016. 5. 1 - 2017. 3.31	Konoshima, Masashi	2015. 4. 1 - 2017. 3.31
Fukuda, Haruhisa	2015. 4. 1 - 2017. 3.31	Kubota, Takafumi	2015. 4. 1 - 2017. 3.31
Furukawa, Masakazu	2015. 4. 1 - 2016. 3.31	Kubota, Yasuhiro	2015. 4. 1 - 2017. 3.31
Ibid.	2016. 5. 1 - 2017. 3.31	Kunitomo, Naoto	2015. 4. 1 - 2017. 3.31
Fushiki, Tadayoshi	2015. 4. 1 - 2017. 3.31	Manabe, Kazufumi	2015. 4. 1 - 2017. 3.31
Goto, Masataka	2015. 4. 1 - 2017. 3.31	Matsui, Shigeyuki	2015. 4. 1 - 2017. 3.31
Hara, Hisayuki	2015. 4. 1 - 2017. 3.31	Matsumoto, Wataru	2015. 4. 1 - 2017. 3.31
Hayashi, Fumi	2015. 4. 1 - 2017. 3.31	Matsuura, Masaaki	2015. 4. 1 - 2016. 3.31
Hirose, Osamu	2015. 4. 1 - 2017. 3.31	Minami, Mihoko	2015. 4. 1 - 2017. 3.31
Honda, Toshio	2015. 4. 1 - 2017. 3.31	Miura, Kenichi	2015. 4. 1 - 2017. 3.31
Horiguchi, Toshihiro	2015. 4. 1 - 2017. 3.31	Miyamoto, Michiko	2015. 4. 1 - 2017. 3.31
Imada, Takatoshi	2015. 4. 1 - 2017. 3.31	Miyamoto, Sadaaki	2015. 4. 1 - 2017. 3.31
Ishigaki, Tsukasa	2015. 4. 1 - 2017. 3.31	Mizuta, Masahiro	2015. 4. 1 - 2017. 3.31
Iwasaki, Manabu	2015. 4. 1 - 2017. 3.31	Motohashi, Eiji	2015. 4. 1 - 2017. 3.31
Iwata, Takaki	2015. 4. 1 - 2017. 3.31	Motomura, Yoichi	2015. 4. 1 - 2017. 3.31
Kameya, Takashi	2015. 4. 1 - 2017. 3.31	Nagafuchi, Osamu	2015. 4. 1 - 2016. 3.31
Kamo, Kenichi	2015. 4. 1 - 2017. 3.31	Nagao, Hiromichi	2015. 4. 1 - 2017. 3.31
Katagiri, Hideki	2015. 4. 1 - 2016. 3.31	Nakamura, Kazuyuki	2015. 4. 1 - 2017. 3.31

Nakamura, Ryota	2015. 4. 1 - 2016. 3.31	Tsumoto, Shusaku	2015. 4. 1 - 2017. 3.31
Ibid.	2016. 5. 1 - 2017. 3.31	Tsunoda, Hiroko	2015. 4. 1 - 2017. 3.31
Nakanishi, Hiroko	2015. 4. 1 - 2017. 3.31	Tsunoda, Tatsuhiko	2015. 4. 1 - 2017. 3.31
Ninomiya, Yoshiyuki	2015. 4. 1 - 2016. 3.31	Washio, Takashi	2015. 4. 1 - 2017. 3.31
Nishii, Ryuei	2015. 4. 1 - 2016. 3.31	Watanabe, Michiko	2015. 4. 1 - 2017. 3.31
Ohnishi, Toshio	2015. 4. 1 - 2016. 3.31	Yamagata, Yoshiki	2015. 4. 1 - 2017. 3.31
Ohtaki, Megu	2015. 4. 1 - 2016. 3.31	Yamashita, Hiroshi	2015. 4. 1 - 2017. 3.31
Okada, Yukihiko	2015. 4. 1 - 2017. 3.31	Yoneda, Masato	2015. 4. 1 - 2017. 3.31
Okuhara, Koji	2015. 4. 1 - 2016. 3.31	Yoshiba, Toshinao	2015. 4. 1 - 2017. 3.31
Ono, Tadashi	2015. 4. 1 - 2017. 3.31	Yoshida, Nakahiro	2015. 4. 1 - 2017. 3.31
Onodera, Toru	2015. 4. 1 - 2017. 3.31	Tsukahara, Hideatsu	2015. 5. 1 - 2017. 3.31
Otani, Shinichi	2015. 4. 1 - 2017. 3.31	Motoyama, Hitoshi	2015. 7. 1 - 2017. 3.31
Ozaki, Koken	2015. 4. 1 - 2017. 3.31	Nishiyama, Yoichi	2015. 7. 1 - 2017. 3.31
Sakai, Naoki	2015. 4. 1 - 2017. 3.31	Kurata, Hiroshi	2015.10. 1 - 2016. 3.31
Sato, Seisho	2015. 4. 1 - 2017. 3.31	Ibid.	2016. 6. 1 - 2017. 3.31
Sato, Tadahiko	2015. 4. 1 - 2017. 3.31	Fujisaki, Hiroshi	2015.10. 1 - 2017. 3.31
Sato, Toshiya	2015. 4. 1 - 2017. 3.31	Fujii, Satoshi	2016. 4. 1 - 2017. 3.31
Sato, Yoshimichi	2015. 4. 1 - 2017. 3.31	Fujisawa, Katsuki	2016. 4. 1 - 2017. 3.31
Shiina, Yo	2015. 4. 1 - 2017. 3.31	Kawano, Shuichi	2016. 4. 1 - 2017. 3.31
Shimizu, Yasutaka	2015. 4. 1 - 2016. 3.31	Kikuzawa, Saeko	2016. 4. 1 - 2017. 3.31
Ibid.	2016. 5. 1 - 2017. 3.31	Komori, Osamu	2016. 4. 1 - 2017. 3.31
Shinano, Yuji	2015. 4. 1 - 2017. 3.31	Maruo, Kazushi	2016. 4. 1 - 2017. 3.31
Sono, Shintaro	2015. 4. 1 - 2017. 3.31	Sakaori, Fumitake	2016. 4. 1 - 2017. 3.31
Tachimori, Hisateru	2015. 4. 1 - 2017. 3.31	Takahashi, Kei	2016. 4. 1 - 2017. 3.31
Takahashi, Rinya	2015. 4. 1 - 2017. 3.31	Takemura, Akimichi	2016. 4. 1 - 2017. 3.31
Takizawa, Satoshi	2015. 4. 1 - 2017. 3.31	Yoshino, Takaaki	2016. 4. 1 - 2017. 3.31
Tanaka, Katsuya	2015. 4. 1 - 2016. 3.31	Maruyama, Hiroshi	2016. 6. 1 - 2017. 3.31
Teramukai, Satoshi	2015. 4. 1 - 2017. 3.31	Mizukami, Yuji	2016. 6. 1 - 2017. 3.31
Terui, Nobuhiko	2015. 4. 1 - 2017. 3.31	Shimizu, Makoto	2016. 8. 1 - 2017. 3.31
Tomita, Makoto	2015. 4. 1 - 2017. 3.31	Ueki, Masao	2016.11. 1 - 2017. 3.31
Tsuchiya, Takashi	2015. 4. 1 - 2017. 3.31	Saitou, Shigeru	2017. 1. 1 - 2017. 3.31
Tsuda, Hiroshi	2015. 4. 1 - 2017. 3.31	Someya, Hiroshi	2017. 1. 1 - 2017. 3.31
Tsuda, Koji	2015. 4. 1 - 2016. 3.31	Takaguchi, Tarou	2017. 1. 1 - 2017. 3.31

Visiting Research Fellows

In addition to visiting professors, the Institute provides research fellowships to researchers in Japan and abroad, from companies as well as from

universities. The Institute also provides support for those who are appointed as staff of programs by the Japan Society for the Promotion of Science (JSPS). A list follows showing research fellows received during the period April 2015 to March 2017.

(The list does not show all of the visiting fellows from abroad. Foreign visiting research fellows are listed under "Foreign Visitors" on page 38.)

— *Research fellows upon JSPS program* —

Fukaya, Keiichi
Noda, Takuji
Uematsu, Yoshimasa

— *Japanese visiting research fellows* —

Baba, Yasumasa
Dou, Xiaoling
Funatogawa, Takashi
Han, Peng
Hara, Ryuichiro
Hayamizu, Momoko
Hayashi, Kenichi
Hirotsu, Chihiro
Ide, Takanori
Ikoma, Norikazu
Imamura, Takeshi
Imoto, Tomoaki
Ishiguro, Makio
Isomura, Tetsu
Ito, Yosuke
Kazama, Kimie
Kazama, Toshiya
Kiyosugi, Koji
Koike, Yuta
Komori, Osamu
Konno, Hidetoshi
Markov, Konstantin
Matsu'ura, Mitsuhiro
Matsumoto, Yukio
Miura, Ryozo
Miwa, Yoshiko
Miya, Nobuhiro
Mukai, Yoshitaka
Nakazawa, Koyomi
Ninomiya, Yoshiyuki
Nishihara, Hidenori
Nomura, Shunichi
Notsu, Akifumi
Omi, Takahiro
Ono, Yohei
Onoduka, Ayuko
Oya, Kosuke
Saita, Satoko
Saito, Masaya
Saito, Yuki
Sakota, Takahiro
Sano, Natsuki
Segawa, Takahiro
Seki, Mami
Shibai, Kiyohisa
Shibuya, Kazuhiko
Shikano, Kiyohiro
Shimizu, Kunio
Shiota, Sayaka
Suzuki, Shigenori
Tadano, Terumasa
Takahashi, Hisanao
Takebayashi, Yoshitake
Takenouchi, Takashi
Tanabe, Kunio
Tanaka, Mieko
Tanaka, Ushio
Tanaka, Yutaka
Tokunaga, Terumasa
Toyoda, Tadashi
Tsubaki, Hiroe
Yamauchi, Takashi
Yanagimoto, Takemi

— *Students from graduate school* —

Amimoto, Ryo
Ban, Mutsuhisa
Eshima, Shusei
Furumoto, Masahiro
Hisaoka, Tatsuo
Kurisu, Daisuke
Nakajima, Masahiko
Sasaki, Tomoya
Tubota, Toshiya

Professor Emeritus

Baba, Yasumasa
Hasegawa, Masami
Hirano, Katsuomi
Ishiguro, Makio
Itoh, Yoshiaki
Kashiwagi, Nobuhisa
Kitagawa, Genshiro
Matsunawa, Tadashi
Murakami, Masakatsu
Nakamura, Takashi
Ogata, Yosihiko
Ohsumi, Noboru
Sakamoto, Yoshiyuki
Shimizu, Ryoichi
Suzuki, Giitiro
Suzuki, Tatsuzo
Tanabe, Kunio
Tanemura, Masaharu
Tsubaki, Hiroe
Yanagimoto, Takemi

3 Research Collaboration

The Institute runs a unique system to promote collaborative research activities between statisticians and scientists in related fields, such as the social sciences, the humanities, life sciences, earth and space sciences and engineering. The system was initiated in 1985 with a special intention, which has much to do with the past experience of the Institute. Since the very beginning of the history of the Institute, one of the basic principles has been to attach great importance to applications. The principle came from appreciating that innovative methodologies and theories of statistics are frequently developed in an effort to solve real problems.

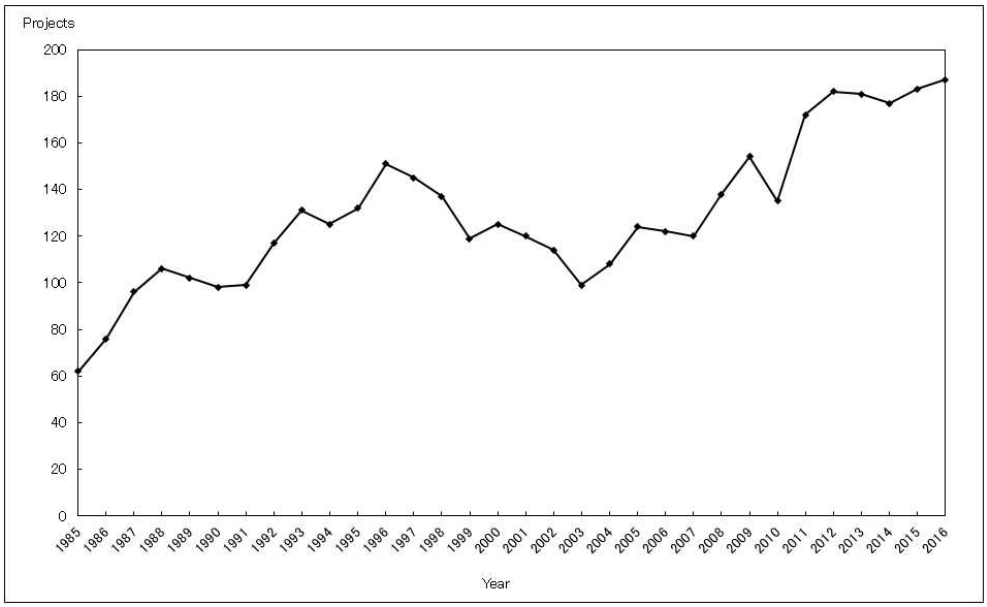
In past decades the Institute has maintained research collaborations between universities, government offices, private companies and various organizations. During this time, much useful work, both in theory and application, has been produced. This tradition of open collaboration with scientists outside the Institute has created a progressive and liberal academic atmosphere which, we believe, has contributed to developing new interdisciplinary research fields in related sciences.

The cooperative research activity was maintained through various research fields at different levels with various types of collaboration, long before the Institute was reorganized into an inter-university research institute. Many remarkable results have been produced through collaborative research in the last decades. To our regret, however, when joint work is organized by researchers at the individual level, the fruit of the collaborative research tends to be received by the general public as a successful contribution to the science where the solved problems arose, even when our statisticians played the most essential role. Obviously this tendency comes from the inherently abstract nature of statistics. The statistician's contribution, although essential, is not as easy to explain to the general public as explaining the problem itself in applied science. Accordingly, it seemed that the value and the raison d'être of the statisticians and the Institute was not appreciated as much as other scientists and research institutes in the applied sciences.

Our cooperative research system was initiated on the basis of two understandings. Firstly, this kind of collaborative research activity is beneficial to both statistics and other related sciences. Secondly, statisticians working in such circumstances need recognition, support and encouragement. We hope that the present system will play a role similar to the one that hospitals play in the medical sciences. Without constant stimuli from patients in the hospital, little development in medical sciences would be expected.

Since 1985 the system has been run by the Cooperative Research Committee, half of whose members are scientists from outside the Institute. Cooperative research projects between statisticians and scientists in related scientific fields are called for each year. More than a hundred projects in applied sciences and statistics are supported each year (see the figure below). In 1998, in hopes of enlarging the area of collaboration, the Institute relaxed a condition of application for projects which had stipulated that at least one member of the research project should belong to the Institute. The system of cooperation is open to projects that are to be planned and accomplished through international cooperation.

Our cooperative research projects are classified into several categories: cooperative use registration, general cooperative research 1, general cooperative research 2, specially promoted research and cooperative research symposium.



Number of collaborative research projects

4 International Research Exchange

Historically, statistical science has developed in response to the need for statistical ideas and methods to be exploited in other fields of science and industry. Therefore the Institute has established a systematic way to promote cross-disciplinary research projects either at a domestic or an international scale (see the previous chapter).

The Institute has also pushed forward research collaboration with a wide variety of foreign institutions including universities and governmental agencies.

Since 1988, the Institute has entered into special relationship with the following institutes to conduct programs on academic exchange and facilitate joint research projects;

- The Statistical Research Division of the U.S. Bureau of the Census, U.S.A., 1988-
- Stichting Mathematisch Centrum, Netherlands, 1989-
- Institute for Statistics and Econometrics, Humboldt University of Berlin, Germany, 2004-
- Institute of Statistical Science, Academia Sinica, Taiwan, 2005-
- The Steklov Mathematical Institute, Russia, 2005-
- Central South University, China, 2005-
- Soongsil University, Korea, 2006-
- Department of Statistics, University of Warwick, U.K., 2007-
- The Indian Statistical Institute, India, 2007-
- Department of Empirical Inference, Max Planck Institute for Biological Cybernetics, Germany, 2010-
- Faculudade de Medicina da Universidade de São Paulo, Brazil, 2011-
- Department of Communication Systems, SINTEF Information and Communication Technology, Norway, 2012-
- Human Language Technology Department, Institute for Infocomm Research, Singapore, 2012-

- Centre for Computational Statistics and Machine Learning, University College London, U.K., 2012-
- Department of Electronics and Telecommunications, Norwegian University of Science and Technology, Norway, 2012-
- Department of Probability and Mathematical Statistics, Charles University in Prague, Czech Republic, 2012-
- The Department of Ecoinformatics, Biometrics and Forest Growth of the Georg-August University of Goettingen, Germany, 2012-
- The Korean Statistical Society, Korea, 2013-
- Toyota Technological Institute at Chicago, U.S.A., 2014-
- Mathematical Sciences Institute Australian National University, Australia, 2014-
- RiskLab ETH Zurich, Switzerland, 2015-
- Institut de Recherche en Composants logiciel et materiel pour l' Information et la Communication Avancee (IRCICA), France, 2015-
- Le laboratoire de mathematiques de l' Universite Blaise Pascal, France, 2015-
- Centre de Rechereche en Informatique, Signal et Automatique de Lille (CRIStAL), France, 2015-
- University College London (UCL) Big Data Institute, U.K., 2015-
- The Institute of Forestry, Pokhara of Tribhuvan University, Nepal, 2015-
- The Institute of Forest and Wildlife Research and Development of the Forestry Administration of Cambodia, Cambodia, 2015-
- The Chancellor masters and Scholars of the University of Oxford, U.K., 2015-
- Forest Inventory and Planning Institute, Vietnam, 2015-
- The University of Porto, Portugal, 2016-
- Zuse Institute Berlin, Germany, 2016-
- Natinonal University of Laos, Vientiane, 2017-

The Institute has also been active in organizing international conferences and workshops. In April 2015-March 2017, 22 international symposia were held under the auspices of the Institute;

- International Symposium on Dependence and Copulas 2015, June 23, 2015
- STM2015&CSM2015, July 13-17, 2015
- Pacific Rim Cancer Biostatistics Conference, August 14-15, 2015

- Joint International Symposium By Japan, Korea and Taiwan - Sustainable Forest Ecosystem Management in Rapidly Changing World -, August 31-September 4, 2015
- ISM HPC on R Workshop, October 11-12, 2015
- Rare Event Sampling and Related Topics III, November 11-13, 2015
- IBIS2015, November 25-28, 2015
- 7th International Workshop on Analysis of Micro Data of Official Statistics, December 16-21, 2015
- International Workshop on Causal Inference, January 6-7, 2016
- What is a good model? Evidential statistics, information criterion and model evaluation, January 12-13, 2016
- Topics in Advanced Monte Carlo Methods, March 9-10, 2016
- International Symposium-FORMATH SHIGA 2016-, March 16-17, 2016
- Probabilistic Graphical Model Workshop: Sparsity, Structure and High-dimensionality, March 23-25, 2016
- STM2016&CSM2016, July 20-23, 2016
- GCP workshop, July 24-25, 2016
- Joint International Symposium By Japan, Korea and Taiwan - Sustainable Forest Ecosystem Management in Rapidly Changing World -, August 31-September 2, 2016
- 8th International Workshop on Analysis of Micro Data of Official Statistics, December 1-6, 2016
- ANU-UC-ISM Joint Symposium on Environmental Statistics 2016, December 3, 2016
- International Workshop on Marketing Science and Service Research, December 21-22, 2016
- 2017 Probabilistic Graphical Model Workshop: Structure, Sparsity and High-dimensionality, February 22-24, 2017
- Simulations Encounter with Data Science - Data Assimilation, Emulators, Rare Events and Design, March 9-11, 2017
- International Symposium FORMATH HIROSHIMA, March 16-17, 2017

The Institute actively encourages researchers to come to talk or give lectures and also to stay for collaboration with the staff. As shown in the list below, the Institute has received 119 visitors from 36 different countries. Of these researchers, 99 entered into a visiting research fellowship including a visiting professorship. Another list follows showing all the colloquia that were given by foreign visitors.

Foreign Visitors (April 2015-March 2017)

- The asterisk * before a visitor's name indicates that he/she is a visiting professor or a visiting research fellow.
- Date in the list refers to the period of visiting professorship/research-fellowship or the date of colloquium.

From Australia

*Shevehenko, Pavel 15.7.12-15.7.19
*Egan, Malcolm 15.7.12-15.7.26
*Ibid. 16.7.19-16.7.26
*Liu, Shuangzhe 16.1.13-16.1.21
*Clark, Robert 16.1.9-16.1.17
Price, Leah 17.2.16
Welsh, Alan.....17.3.16

From Belgium

*Segers, Johan 15.6.20-15.6.25

From Bosnia and Herzegovina

*Sejdinovic, Dino 16.3.22-16.4.4

From Canada

*Joe, Harry 15.6.21-15.6.27
*Rivest, Louis-Paul..... 16.1.12-16.1.16
*Shcherbakov, Robert.....16.6.16-16.7.14
*Yasui, Nikolaus 16.6.27-16.8.26

From China

*Cao, Ying 15.4.1-17.3.31
*Hasegawa, Masami..... 15.4.1-17.3.31
*Yonezawa, Takahiro 15.4.1-17.3.31
*Lu, Shaogao..... 15.4.1-16.3.31
*Wu, Lihui 15.4.1-16.3.31
*Shi, Ningzhong..... 15.5.18-15.6.12
*Chiu, Sung Nok..... 15.7.6-15.7.25
*Kou, Samuel..... 15.7.9-15.7.14
*Jin, Xin..... 15.7.11-15.7.19
*Wen, Zeng-Ping..... 15.7.11-15.7.20
*Huijie, Tian..... 15.7.12-15.7.25
*Zhou, Shiyong 15.7.12-15.7.25
*Ibid. 16.2.10-16.2.20
*Ibid. 16.7.16-16.7.23
*Ibid. 17.1.13-17.1.23
*Chen, Shi 15.8.15-15.9.15
*Ibid. 17.3.16-17.3.31
*Yin, Fengling.....16.1.12-16.2.5
*Wang, Ting 16.1.25-16.2.12
*Ibid. 17.3.28-17.4.9
*Guo, Yicun 16.2.1-16.3.31
Li, Yingying 16.3.10
Ng, Michael Kwok-Po 16.4.22
*Chan, Jennifer 16.7.17-16.7.29
*Ma, Xiaokai 16.10.2-16.10.16
*Wang, Yunan 16.10.19-16.11.2
*Liu, Shuyuan.....17.1.5-17.1.24
*Jiang, Changsheng.....17.3.16-17.3.31

From Czech Republic

*Surovy, Peter 15.10.2-15.10.31
*Ibid. 16.10.14-16.11.4

From Danmark

*Kanaya, Shin 15.5.21-15.8.11
Peters, Jonas.....17.3.10

From France

*Septier, François Jean Michel....15.7.1-15.7.31
*Ibid. 16.7.11-16.8.4
*Laurent, Clavier 15.7.8-15.7.26
*Bagnarosa, Guillaume 15.7.12-15.7.23
*Ibid. 16.7.15-16.7.26
*Chatalic, Antoine 16.1.25-16.6.25
Graczyk, Piotr.....16.4.26
*Clavier, Laurent.....16.7.11-16.7.25
*Azzaoui, Nourddine 16.7.18-16.7.26
*Helmstetter, Agnès 16.9.26-16.10.28

From Germany

Gebhardt, Gregor..... 15.8.18
Strader, Anne 16.6.7
*Ulitzsch, Esther 16.7.15-16.9.13
Jagodzinski, Wolfgang 16.8.8
*Spodarev, Evgeny.....16.11.4-16.11.16

From Greece

*Segkou, Margarita..... 15.4.1-15.4.7

From India

*SenGupta, Ashis.....16.10.22-16.11.21

From Indonesia

*Pratiwi, Hasih 16.8.26-16.9.3
*Respatiwulan 16.8.26-16.9.3

From Israel

*Nevat, Ido..... 15.7.12-15.7.17
*Ibid. 16.7.17-16.7.24

From Italy

*Taroni, Matteo..... 16.1.12-16.2.11

From Korea

*Lee, Kwangmin..... 17.1.30-17.2.28
*Lee, Youngseon 17.1.30-17.2.28
*Park, Hoyoung.....17.1.30-17.2.28
Kim, Sunyoung 17.2.23

From Malaysia

*Siew, Hai-Yen 16.4.1-17.3.31
*Ibrahim, Adriana Irawati Nur Binti 17.2.27-17.3.3
*Othman, Wan Ainun Binti Mior 17.2.27-17.3.3

From Morocco

*Azzaoui, Nourddine 15.7.12-15.7.17

From Netherlands

*Van de Velden, Michel..... 16.5.16-16.7.29

From New Zealand

*Gerstenberger, Matthew 15.7.1-16.3.31
*Harte, David Shamus 16.9.28-16.10.28
Hirose, Yuichi.....16.12.22

From Norway

*Myrvoll, Tor Andre..... 15.7.6-15.7.31
*Ibid. 16.7.11-16.8.5

From Poland

*Pokorski, Mieczyslaw 15.4.1-15.10.15
*Chwialkowski, Kacper Piotr... 15.7.24-15.8.21
*Ibid. 16.3.11-16.4.6
*Zaremba, Anna 16.7.14-16.8.6
*Toczydlowska, Dorota 16.7.14-16.9.30

From Portuguese

*Pedroso, Joao Pedro 15.12.1-15.12.31

From Russian

*Tsukernik, Maria 15.11.10-15.11.28
*Mafusalov, Alexander.....17.3.17-17.3.31

From Singapore

Chen, Ying 16.3.9

From Spain

*Leguey, Ignacio..... 17.2.2-17.5.3

From Sweden

*Brannvall, Lars Rickard Nakamura ... 15.9.14-15.9.19

From Swiss

Künsch, Hans R. 15.4.7
Wu, Stephen 15.4.17
*Wüthrich, Mario Valentin 16.7.14-16.8.12

From Taiwan

*Lin, Gwo-Dong 15.4.1-15.4.6
*Hwang, Hsien-Kuei 15.4.1-15.4.8
*Ibid. 16.3.14-16.3.23
*Ibid. 16.7.26-16.8.23
*Chen, Su-Yun 15.4.1-15.4.11
*Phoa, Frederick Kin Hing ... 15.7.12-15.7.14
*Ibid. 16.3.22
*Chien, Jen-Tzung.....15.7.12-15.7.17
*Ibid. 16.7.19-16.7.23
*Chen, Yuh-Ing.....16.7.16-16.7.23
*Lo, Yen-Wen 16.7.16-16.7.23

From Thailand

*Jitkrittum, Wittawat..... 16.3.20-16.4.9
*Ibid. 17.2.20-17.4.11

From U.K.

*Gretton, Arthur..... 15.4.1-17.3.31
*McNeil, Alexander J. 15.6.18-15.6.27
*Peters, Gareth William..... 15.7.1-15.9.29
*Ibid. 16.7.19-16.9.23
*Wynn, Henry Philip..... 15.7.3-15.7.17
*Ames, Matthew 15.7.12-15.7.24
*Ibid. 16.7.17-16.8.7
*Doucet, Arnaud.....15.7.24-15.8.14
*Ibid. 16.7.15-16.8.5
Guillas, Serge.....15.11.17
*Macrina, Andrea 16.7.19-16.7.27
*Pewsey, Arthur.....16.12.15-17.1.9

From U.S.A.

*Synodinos, Nicolaos Emmanuel.... 15.6.1-15.7.31
*Yoshida,Ruriko 15.6.1-16.3.31
*Ibid. 16.6.2-16.7.1
*Wilburne, Dane Robert..... 15.6.15-15.8.19
*Richard, Mercedes T 15.6.24-15.8.7
*Richards, Donald ST. P. 15.6.25-15.8.6
Kagan, Yan Y. 15.8.4
*Dennis, Brian 16.1.8-16.1.24
*Lele, Subhash R..... 16.1.8-16.1.25
*Ponciano, Jose Miguel 16.1.8-16.1.25
*Taper, Mark Louis 16.1.8-16.2.14
Zhang, Jun 16.2.4
*Doi, Jimmy 16.4.1-16.6.30
Tseng, George C. 16.6.24
*Moroishi, Yuka 16.7.7-16.8.25
*Takanami, Tetsuo.....16.9.23-16.10.11
Xing, Eric 16.11.21
Mascagni, Michael.....16.12.19-16.12.20
*Drton, Mathias.....17.1.5-17.3.22
*Miyazaki,Yasuo 17.2.28-17.3.9
*Norton, Mathew.....17.3.17-17.3.31

Colloquia by Foreign Visitors

(2015.4-2017.3)

Speaker (Country)	Title	Date
Phoa, Frederick Kin Hing (Taiwan)	The Swarm Intelligence Based (SIB) method and its applications in statistics	2015. 4. 1
Künsch, Hans R. (Swiss)	Data assimilation in seismology?	2015. 4. 7
Wu, Stephen (Swiss)	Living with uncertainty	2015. 4.17
Yoshida, Ruriko (U.S.A.)	Extremal positive semidefinite matrices for weakly bipartite graphs	2015. 7.10
Kagan, Yan Y. (U.S.A.)	Statistics of earthquake focal mechanisms	2015. 8. 4
Gebhardt, Gregor (Germany)	The generalized Kernel Kalman Filter - learning forward models from high dimensional observations	2015. 8.18
Gerstenberger, Matthew (New Zealand)	The New Zealand national seismic hazard model: Rethinking PSHA	2015. 9. 1
Chen, Shi (China)	A study on the regional gravity changes before large earthquakes from the statistical perspectives	2015. 9. 1
Guillas, Serge (U.K.)	Dimension reduction for the quantification of uncertainties in tsunami and climate models	2015.11.17
Pedroso, João Pedro (Portuguese)	Heuristics for Packing Semifluids	2015. 12. 3
Yin, Fengling (China)	Coulomb stress evolution along the middle segment of Redriver fault zone over the past 180 Years due to coseismic, postseismic and interseismic deformation	2016. 1.27
Taroni, Matteo (Italy)	Some recent techniques to improve earthquake forecasting	2016. 1.27
Zhang, Jun (U.S.A.)	Symplectic and (para)-Kahler structures on statistical manifolds	2016. 2. 4

Speaker (Country)	Title	Date
Wang, Ting (New Zealand)	Identification of seismic phases using Markov-modulated marked Hawkes processes	2016. 2. 9
Chen, Ying (Singapore)	Risk related brain regions detection and individual risk classification with 3D image FPCA	2016. 3. 9
Li, Yingying (China)	A unified approach to volatility estimation in the presence of both rounding and random market microstructure noise	2016. 3.10
Guo, Yicun (China)	Iterative finiteETAS model and some results of the histETAS model of the North China Craton	2016. 3.22
Phoa, Frederick Kin Hing (Taiwan)	Network exploration by complements of graphs with graph coloring	2016. 3.22
Phoa, Frederick Kin Hing (Taiwan)	A Scanning method for detecting communities in social networks	2016. 3.22
Phoa, Frederick Kin Hing (Taiwan)	Focus statistics for network centrality and metaheuristic approach for shape fine-tune	2016. 3.22
Sejdinovic, Dino (U.K.)	Kernel embeddings for inference with intractable likelihoods	2016. 3.30
Ng, Michael Kwok-Po (China)	Multiple graphs clustering	2016. 4.22
Graczyk, Piotr (France)	Wishart and Riesz distributions on cones related to graphical model	2016. 4.26
Strader, Anne (Germany)	Evaluation of current CSEP testing methods: Case studies for Japan and California	2016. 6. 7
Shcherbakov, Robert (Canada)	The statistics and physics of aftershocks	2016. 6.22
Tseng, George C. (U.S.A.)	Adaptively weighted meta-analysis in -omics applications	2016. 6.24
Chen, Yuh-Ing (Taiwan)	Statistical evaluation of short-term hazard of earthquakes after 1999 M 7.3 Chi-Chi shock in Taiwan	2016. 7.19

Speaker (Country)	Title	Date
Pratiwi, Hasih (Indonesia)	Estimating earthquake risk by using epidemic type aftershock sequence model approach (case study in Java Island, Indonesia)	2016. 8.30
Helmstetter, Agnès (France)	Adaptive smoothing of seismicity in time, space and magnitude for long-term and short-term earthquake forecasts	2016.10.11
Helmstetter, Agnès (France)	Repeating icequakes	2016.10.26
Xing, Eric (U.S.A.)	Strategies & principles for distributed machine learning	2016.11.21
Mascagni, Michael (U.S.A.)	An introduction to Brownian motion, Wiener measure, and partial differential equations	2016.12.19
Mascagni, Michael (U.S.A.)	Reproducibility in Stochastic Simulation	2016.12.20
Hirose, Yuichi (New Zealand)	Profile likelihood approach to a large sample distribution of estimators in joint mixture model of survival and longitudinal ordered data	2016.12.22
Zhou, Shiyong (China)	Could the abnormal seismicity increase triggered remotely by great earthquakes be used to judge the regional earthquake risk?	2017. 1.18
Park, Hoyoung (Korea)	Nonparametric density estimation for symbolic data	2017. 1.31
Lee, Kwangmin (Korea)	Tutorial and problems of recommender system	2017. 1.31
Lee, Youngseon (Korea)	Bayesian curve fitting and function clustering by the linear combination of arbitrary shaped function	2017. 1.31
Price, Leah (Australia)	Advances in sequential Monte Carlo and likelihood free methods	2017. 2.16
Kim, Sunyoung (Korea)	Polynomial optimization and conic programming relaxation	2017. 2.23

Speaker (Country)	Title	Date
Peters, Jonas (Danmark)	Invariances and causality	2017. 3.10
Welsh, Alan (Australia)	The effect of the working correlation on fitting models to longitudinal data	2017. 3.16
Norton, Matthew (U.S.A.)	New approaches to binary classification using risk management and robust optimization	2017. 3.23
Mafusalov, Alexander (U.S.A.)	Risk averse distribution approximation	2017. 3.23
Jiang, Chang-Sheng (China)	Assessment of earthquake monitoring capability and score of seismic station detection capability in China Seismic Network (2008~2015)	2017. 3.29

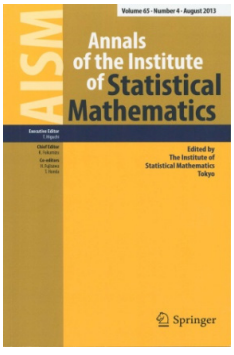
5 Publications

Periodicals

One of the driving forces behind the rapid progress of modern science has undoubtedly stemmed from the broad communication of research findings through international journals and reports. For the sake of publicizing its activities throughout academic and industrial circles, the Institute launched ***Annals of the Institute of Statistical Mathematics*** (AISM) in 1949 shortly after its foundation. Today AISM, distributed by Springer, has a worldwide reputation and is listed in citation review journals.

In the past two years, Volumes 67 to 69 (ten issues) were published. For paper titles, abstracts, and full texts, visit our website at http://www.ism.ac.jp/editsec/aism/, or at http://springerlink.com/. The aims of AISM are shown in the excerpt below:

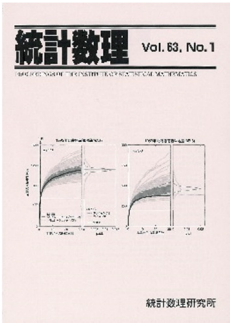
The journal aims to provide an international forum for open communication among statisticians and research workers who have the common purpose of advancing human knowledge through the development of the science and technology of statistics.



AISM will publish the broadest possible coverage of statistical papers of the highest quality. Emphasis will be placed on the publication of papers relating to (a) establishment of new areas of application, (b) development of new procedures and algorithms, (c) development of unifying theories, (d) analysis and improvement of existing procedures and theories, and (e) communication of empirical findings supported by real data.

The objective of AISM is to contribute to the advancement of statistics as a science for human handling of information to cope with uncertainties. Special emphasis will thus be placed on the publication of papers that will eventually lead to significant improvements in the practice of

statistics. In addition to papers by professional statisticians, contributions from authors in various fields of application will be welcomed.



The Institute publishes another periodical, ***Proceedings of the Institute of Statistical Mathematics***. This biannual journal made its first appearance in 1953 and now carries scientific papers and articles on topics of research (in Japanese with abstracts in English). Volumes 63 and 64 (four issues) were published in the past two years. Refer to http://www.ism.ac.jp/editsec/toukei/ for paper titles, abstracts and full texts.

Technical Reports

In addition to the two journals mentioned above, the Institute issues seven technical reports:

- *Cooperative Research Report*
- *ISM Survey Research Report*
- *Computer Science Monographs*
- *Research Memorandum*
- *ISM Report on Research and Education*
- *ISM Reports on Statistical Computing*
- *School of Statistical Thinking Research Report*

A list of the seven reports released from April 2015 to March 2017 follows.

Cooperative Research Report

(Reports, in Japanese and English, on the achievements emerging from collaborative research projects in the Institute.)

No.351: Kitano, T., Extreme Value Theory and Applications (13). *(February 2016)*

No.352: Shimura, T., Infinitely divisible processes and related topics(20). *(February 2016)*

No.353: Ishikawa, S., Quantitative Approach for Applied Linguistics. *(March 2016)*

No.354: Shimizu, K., Environmental and Ecological Data Analysis. *(March 2016)*

No.355: Shirakawa, K., Abstract Report of "New developments in studies using micro data of official statistics". *(March 2016)*

No.356: Koyama, Y., Analysis of ESP corpora and its multifaceted pedagogical applications. *(March 2016)*

No.357: Cho, K., Studies in Event Schemas and Constructions. *(March 2016)*

No.358: Ishikawa, Y., Learner Characteristics and Learner Texts: A Quantitative Approach. *(March 2016)*

No.359: Iwaki, S., Analysis and modeling of signals from non-invasive biological measurements (3). *(March 2016)*

No.360: Tanaka, M., Econophysics and related topics (12). *(March 2016)*

No.361: Sato, A., Flows of People and Goods and Related Applications (1). *(March 2016)*

No.362: Sakaori, F., Research on best practice in teaching statistics Vol. 8. *(March 2016)*

No.363: Takeuchi, A., Research on Sports Data Analysis: Theory, Methodology, and Applications Vol.3. *(March 2016)*

No.364: Tabata, T., Text Mining and Text Analysis. *(March 2016)*

No.365: Junko, M., Needs Analysis of English Learning among University Students. *(March 2016)*

No.366: Furuzumi, H., The Studies on the Change of Japan's Industrial Structure by Using Official Statistics (Progressive Report 2). *(March 2016)*

No.367: Ikoma, N., Horizontal Development of Sequential Monte Carlo Method to Diverse Disciplines and Knowledge Aggregation by Comprehension. *(March 2016)*

No.368: Arita, F., Prospect of the Art Activities Derived from Supply and Demand of Performing Arts. *(March 2016)*

No.369: Tsuchiya, T., Optimization - Modeling and Algorithms - 28. *(March*

2016)

No.370: Maruyama, N., Development and Popularization of Dynamic Geometry Software GeoGebra. *(March 2016)*

No.371: Kubota, T., Study report of joint study of the institute of statistical mathematics. *(March 2016)*

No.372: Takizawa, Y., Fundamental Studies on Neuron and Neural System based on Electrophysics and Biomedicine. *(March 2016)*

No.373: Ishikawa, S., Statistical Approach to Applied Linguistics Studies With a Focus on Social Factors. *(March 2017)*

No.374: Ishikawa, Y., Statistical Approach to Applied Linguistics Studies With a Focus on Social Factors. *(March 2017)*

No.375: Shimizu, K., Environmental and Ecological Data Analysis. *(March 2017)*

No.376: Horihata, S., Inverse Problems and Applications on Complex System. *(March 2017)*

No.377: Sato, A., Flows of People, Goods, and Money and Related Applications. *(March 2017)*

No.378: Sato, A., Econophysics and Related Applications (13). *(March 2017)*

No.379: Takeuchi, A., Research on best practice in teaching statistics Vol. 9. *(March 2017)*

No.380: Sakaori, F., Research on Sports Data Analysis : Theory, Methodology, and Applications Vol. 4. *(March 2017)*

No.381: Cho, K., Constructions and Event Schemas. *(March 2017)*

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(Technical reports in Japanese and English that describe management and manipulation of computer systems. Not issued during the period April 2015 to March 2017.)

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(Reports on the achievements emerging from project for fostering and promoting statistical thinking. All the articles published so far are in Japanese, and English titles are appended just as bibliographic information. Not issued during the period April 2015 to March 2017.)

6 Published Papers and Books

Many of the achievements made by the staff of the Institute consist of scientific papers and monographs. Each of the staff has selected works worthy of note out of his/her papers and books published in the period from April 2015 to March 2017, to complete the following list. Also included are works by visiting professors and students.

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7 Tutorial and Consultation Programs

Tutorial courses on statistical science are held 14 times a year for the benefit of researchers, students, and the general public. The levels of courses vary from beginner's level to advanced level.

Year	Category	Title	Month	Number of participants
2015	Basic course	Basic Course of Statistics	May	85
	Standard course	Non-Stationary Time Series Analysis	June	69
	Basic course	Introduction to Sampling Method	July	49
	Basic course	Poisson Distribution – Poisson Regression – Poisson Process	July	100
	Standard course	Privacy-preserving Techniques Managing Big Data	September	85
	Basic course	Introduction to Multivariate Analysis	September	86
	Standard course	Random Matrices in Data Analysis – Theory and Application	October	61
	Standard course	Mathematical Optimization and Its Application	October	59
	Advanced course	An Introduction to Computational Algebraic Statistics	November	25
	Advanced course	Variational Data Assimilation: The Adjoint Method for State-Space Models	December	69

Year	Category	Title	Month	Number of participants
2016	Standard course	Longitudinal Data Analysis	January	69
	Standard course	An Introduction to the Statistical Analysis of Point Process Networks	February	77
	Standard course	Statistical Analysis of Random Partitions	February	29
	Standard course	Design of Experiments with R	February	48
	Basic course	Basic Course of Statistics	May	66
	Basic course	Poisson distribution – Poisson regression – Poisson process	May	100
	Standard course	Big Data Analysis by Hadoop and R	June	70
	Standard course	Sparse Estimation	July	100
	Advanced course	Introduction Geometry for Understanding Statistics	August	39
	Basic course	Introduction to Multivariate Analysis	September	62
	Standard course	Particle Filters and Their Applications	September	98
	Basic course	Analysis of Complex Sample Surveys	October	17
	Standard course	Stochastic Optimization for Statistics and Machine Learning	November	98
	Standard course	Biodiversity and Statistical Mathematics	December	45
2017	Standard course	Statistical Science of Missing Data: Elements of the Theory and Practical Methodology	January	98
	Standard course	Statistical Disclosure Control and Differential Privacy	February	46
	Standard course	Topological Data Analysis: Introduction and Applications	February	80
	Basic course	Poisson distribution – Poisson regression – Poisson process	February	49

The Institute launched the School of Statistical Thinking in January 2012. Since then, the School has centralized control over the educational programs for the general public. Tutorial courses are the most popular among the programs operated by the School. There is consistent demand for non-degree pursuing continuous education from the private sector. Actually around 70% of the total attendants are from private companies. A yearly open lecture is a more accessible half-day program where a timely topic relating to statistical science is explained in plain language.

Former services for consultancy have been renovated as the "Research Collaboration Start-Up" program. A team of experienced emeritus professors and young research fellows give advice and handle nearly 40 cases a year. Some of them have led to the registration for our Cooperative Research Program or funded joint project between the Institute and the client company.

The ISM Summer School program is also integrated as an activity of the School. It was started in 2006 as a free crash course open to graduate students from all over Japan. The topic of 2013 was "Information Geometry" which gathered 120 registrations. Since 2014 we have been providing a program for "Mathematical Modeling for Pandemic Disease" which lasts for 10 consecutive days. In 2016, all the lectures were done in English. This program attracts nearly one hundred participants including international students, and surprisingly we find almost no dropouts.

In 1989 the Institute took part in the Graduate University for Advanced Studies and became a degree-granting institution. Since then, the Institute has accepted master's degree holders in the three-year doctoral program. In 2006, the GUAS, and accordingly the Institute, started a five-year program to accept graduates. These programs and courses are managed by the Department of Statistical Sciences, not by the School of Statistical Thinking. See also Supplement.

8 Software Products

The creation of new theories and new methods of analysis generally accompany testing procedures, which are often fulfilled through complicated calculations run by elaborate computer programs. The Institute believes that programs and software completed in the course of research should be delivered as quickly as possible to the relevant fields of science and business. Therefore the Center for Engineering and Technical Support is engaged in cataloguing and storing in a library the software products developed at the Institute. Detailed information on the library, named ISMLIB, is available through: kks@ism.ac.jp (e-mail), http://www.ism.ac.jp/ (URL). Some programs in the library can be downloaded from the Internet site. The following is a partial list of programs developed in the Institute. Most of the programs are coded in Fortran, C, C++, Java, S and R.

Programs developed in ISM

Program	Explanation etc.	Access
■ TIMSAC (*TIMe Series Analysis and Control*)	— *Main features* — Package of programs for analysis, prediction and control of time series. — *Typical examples of application* — ・ Analysis of channel records of brain wave ・ Analysis of economic data ・ Optimal control of plants ・ Implementation of ship's autopilot ・ Analysis of seismological data	Mail to kks@ism.ac.jp

Program	Explanation etc.	Access
■ TIMSAC for Windows	— *Main features* — TIMSAC program implemented on Windows. — *Typical examples of application* — ・ Analysis of brain wave ・ Prediction of sales ・ Prediction of stock price ・ Analysis of seismological data	Mail to kks@ism.ac.jp
■ TIMSAC for R package	TIMSAC program implemented as an R package.	http://jasp.ism.ac.jp/ism/timsac/
■ Web Decomp	A system for time series analysis, mainly for seasonal adjustment or decomposition, used through our Web page.	http://ssnt.ism.ac.jp/inets/inets.html
■ Ardock (dock for AR models)	— *Main features* — A dialogue system for system analysis. — *Typical examples of application* — ・ Analysis of industrial plants ・ System analysis ・ Analysis of chemical processes in human bodies	http://www.ism.ac.jp/ismlib/jpn/ismlib/
■ TIMSAC84: Statistical Analysis of Series of Events (TIMSAC84-SASE) Version 2	Progrms for point process analysis.	http://www.ism.ac.jp/~ogata/Ssg/ssg_softwaresE.html
■ BAYSEA (BAYesian SEasonal Adjustment)	— *Main features* — Computer program for realizing a decomposition of a time series into trend, seasonal and irregular components. — *Typical examples of application* — ・ Seasonal adjustment of economic time series	Mail to kks@ism.ac.jp

Program	Explanation etc.	Access
■ CATDAP (CATegorical Data Analysis)	— *Main features* — A program for the selection of variables that explain well the structure of categorical data. — *Typical examples of application* — ・ Analysis of multi-dimensional contingency tables	Mail to kks@ism.ac.jp
■ CATDAP for Windows	CATDAP program implemented on Windows.	Mail to kks@ism.ac.jp
■ CATDAP for R package	CATDAP program implemented as an R package.	http://jasp.ism.ac.jp/ism/catdap/
■ QUANT (QUANTification theory)	— *Main features* — Programs for the quantification theories of type I, II, III. — *Typical examples of application* — ・ Survey of behavior of the younger generation ・ Analysis of clinical data ・ Prediction of elections ・ Effect of advertisement ・ Data analysis in educational psychology	Mail to kks@ism.ac.jp
■ DALL	— *Main features* — Davidon's variance algorithm subroutine customized for maximum likelihood. — *Typical examples of application* — ・ Analysis of medical data ・ Analysis of multi-dimensional non-stationary data	http://www.ism.ac.jp/ismlib/jpn/ismlib/
■ Jasp (Java based Statistical Processor)	— *Main features* — An experimental statistical analysis system written in Java language. — *Typical examples of application* — ・ Explanatory data analysis ・ Developing new computational statistical methodology	http://jasp.ism.ac.jp/

Program	Explanation etc.	Access
■ Jasplot (Java statistical plot)	— *Main features* — Statistical graphics library in Java language. — *Typical examples of application* — ・Data visualization	http://jasp.ism.ac.jp/jasplot/
■ Statistical Analysis of Seismicity - updated version (SASeis2006)	Programs for seismicity analysis.	http://www.ism.ac.jp/~ogata/Ssg/ssg_softwaresE.html
■ SAPP	An R package for seismicity analysis based on TIMSAC84-SASE Version 2 and SASeis2006.	http://jasp.ism.ac.jp/ism/sapp/
■ NScluster	An R package for simulation and estimation of the Neyman-Scott type spatial cluster models.	http://jasp.ism.ac.jp/ism/NScluster/
■ CloCK-TiME	Web service to analyze multivariate time series by the particle filter.	http://sheep.ism.ac.jp/CloCK-TiME/
■ TSSS	An R package for time series analysis with state space model	http://jasp.ism.ac.jp/ism/TSSS

(Supercomputer system A (right), I (left), C (center))

Supplement

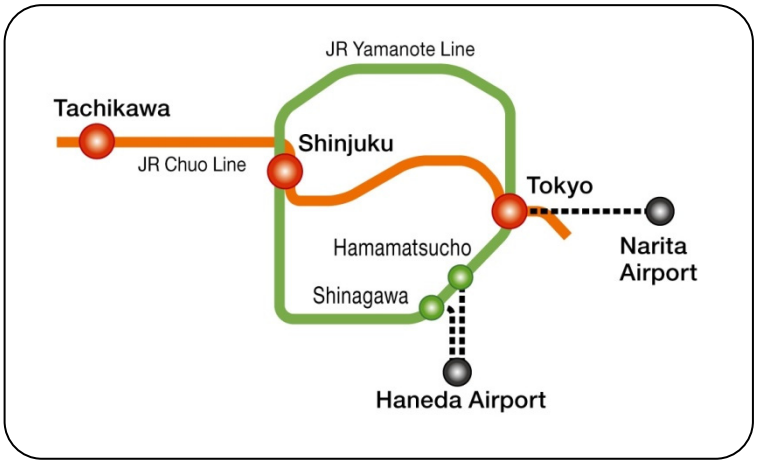
Introduction to the Department of Statistical Science, School of Multidisciplinary Sciences, SOKENDAI (The Graduate University for Advanced Studies)

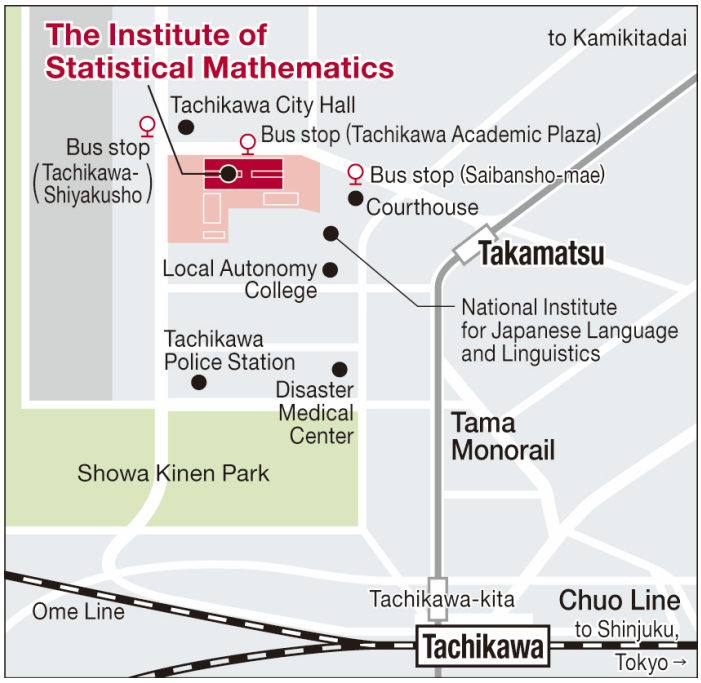
"SOKENDAI (The Graduate University for Advanced Studies) is a graduate university with no undergraduate programs that consists of departments housed in affiliated Inter-University Research Institutes and the School of Advanced Sciences attached directly to SOKENDAI. The Inter-University Research Institutes are research centers for joint use by universities throughout Japan in their various research fields. As such, these institutes serve as centers of advanced research in their respective research fields and as nodes of scholarly communication that support international joint research. The School of Advanced Sciences, which is located in Hayama and has no such parent institute, conducts advanced research into the evolution of life and the relationship between science and society."

(from the President's Statement)

SOKENDAI (The Graduate University for Advanced Studies) was thus established in October 1988 with seven institutes as parents. As of April 2017, the University has grown to have 17 parent institutes and 1948 Ph.D. students. The organization is composed of 6 schools that comprise 20 departments and a center. In the Department of Statistical Science, research and educational activities focus on the effective use of data for the realization of rational inferences or predictions, in the same way as in the construction and confirmation of scientific hypotheses. The subject area covers the theory and application of statistical science, such as fundamental statistical theory and statistical methodologies including prediction and data assimilation, survey science, machine learning, risk analysis, optimization, decision making, and control. Since its establishment, 126 Doctors of Philosophy have been conferred by the Department. As of April 2017, the Department has 25 students.

Location of the Institute





Access to the ISM

- Tama Monorail
  - -10 min walk from Takamatsu Sta.
- Tachikawa Bus
  - -Tachikawa Academic Plaza bus stop
  - -5 min walk from Saibansho-mae or Tachikawa-Shiyakusho bus stop

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