The Institute of Statistical Mathematics

International Cooperation
The ISM facilitates international research cooperation by signing memorandum of agreement (MOA) with overseas universities and research institutes. We hold symposia and conduct joint researches to encourage communications among statistical communities. At present, agreements have been signed with 12 Japanese organizations and 19 foreign organizations.

Graduate School Program
The ISM also serves as a platform institute of The Graduate University for Advanced Studies (Sokendai), an overlaid university on the network of national research institutes. As a platform institute responsible for research and education of The Department of Statistical Science of Sokendai, we offer five-year and three-year Ph.D. courses for talented students who aim at becoming world-class researchers and practitioners. More than 100 Ph.D.’s have been awarded through this program since its inception in 1988.

Open-type Research Collaboration
This academic study program provides researchers from other academic institutes with access to the facilities of the ISM, and provides opportunities for researchers to conduct theoretical and applied studies on statistics by leveraging various research resources accumulated at the ISM.

- 182 activities attended by 739 total participants (As of FY 2012)

Akaike Guest House
The Guest House is built within the premises to enable collaborating researchers to stay for extended periods and to facilitate active interactions among researchers. There are 14 single rooms, 3 double rooms, and 1 accessible room.

Research Organization on Theories and Methodologies for Statistical Inference and Reasoning Based on Data

- Extracting information and acquiring knowledge from huge amount of data sets
Promoting research on scientific methodologies based on data, which is essential in broad fields of science and technology including life, environment, society and economy.

- Addressing real-world problems and solving concrete cases
Pursuing new theories and methods to address difficult real-world problems in the so-called “Information Society” or “Risk Society” as well as conducting research on prediction, knowledge discovery, modeling uncertainty, and risk analysis by solving concrete cases.

- Enhancing the function of the Inter-university Research Organization
Promoting research collaborations with researchers in both academia and industries, which is our priority as an Inter-university Research Organization.

- The NOE (Network Of Excellence) Project
Building a network of researchers all over the world on strategic themes.

- The Project for Fostering and Promoting Statistical Thinking
Training professionals with the “statistical thinking” ability.
**Department of Statistical Modeling**

The Department of Statistical Modeling works on the structural modeling of physical phenomenon 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**
- Complex System Modeling Group
- Latent Structure Modeling Group

**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**
- Metric Science Group
- Structure Exploration Group

**Department of Mathematical Analysis and Statistical Inference**

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

**Mathematical Statistics Group**
- Learning and Inference Group
- Computational Inference Group

---

**NOE (Network Of Excellence) Project**

Use of large-scale data and integrated research is essential for solving the complex problems of modern society. Our interdisciplinary NOE (Network Of Excellence) is a unique program to establish collaborations around statistical mathematics. We have NOE in the five research areas of risk research, next-generation simulation, survey science, statistical machine learning, and service science. The NOE pursues activities to establish new methodologies in their respective research fields and serves as hubs for interdisciplinary interaction as a new approach to collaboration research.

**Risk Analysis Research Center**

Manages risk scientifically by building appropriate models of various increasing uncertainties in society and economics, and by evaluating risk quantitatively.

**Survey Science Center**

Employs social survey research spanning over more than half a century as a foundation for analyzing the changes in the viewpoint of Japanese people as well as comparing with viewpoints in other countries. The Center will pursue the development of methodologies in social survey and statistical analysis methods.

**Service Science Research Center**

Brings the data-centric methodologies into the services fields—from marketing, supply chain management, management engineering, to modeling of social systems.

---

**School of Statistical Thinking**

The School conducts the Project for Fostering and Promoting Statistical Thinking, and disseminates “statistical thinking” through interactions with various people, including researchers who aim to create new statistical fields as well as individuals who recognize the importance of statistics in their research.

**Project for Fostering and Promoting Statistical Thinking**

- **Goal-oriented Activities**
  - **NOE-type Research**
    - Five centers conduct research activities that interface statistical mathematics with individual scientific disciplines in order to find solution to urgent social problems.
    - Through establishing NOE (Network Of Excellence) they conduct related research activities as the core in each NOE domain.
  - **Professional Development**
    - The School of Statistical Thinking develops T-shaped researchers and other specialists.
    - The School also conducts the Project for Fostering and Promoting Statistical Thinking.

---

**Coop with Math Program**

By providing opportunities for nationwide researchers in mathematics and mathematical sciences as well as researchers in various sciences and industries to discuss intensively and continuously, this Program aims to promote cooperative research of mathematics, mathematical sciences, and industries toward solutions for actual problems.

**Building Networks for Training Data Scientists**

There is a large demand for data scientists, who are capable of analyzing data and making decisions based on the analysis. The ISM is forming a network of universities, research institutions, private companies in various industries, and non-profit organizations to help develop data scientists.