



GLOGIFT2010 participants

## Message from the Director and Dean

We are hearing a lot of good news about space projects recently. Many in Japan were excited about the remarkable achievement of the Hayabusa spacecraft and its successful return to Earth in June from its landing spot on the small asteroid, Itokawa. Even with modern technology, it is a historic achievement to rendezvous with a hundreds meter small asteroid and send pictures of it back to Earth. Hayabusa successfully returned the capsule, which showed its advanced control technology and recovery techniques to the world.

The capsule, which traveled six billion kilometers to and from Itokawa in seven years was shown to the public at the Jaxa Institute of Space and Astronautical Science in Sagamihara and Tsukuba Space Center. Record crowds queuing for hours to get a glimpse of the capsule said it was worth the wait; seeing the capsule, which had been on such an adventure, was a very moving experience.

One of the component technologies that played a role in the spacecraft's success was the "ion engine." NEC, the engine developer, is reportedly entering the global market by appealing its performance and reliability demonstrated in space. Considerable demand is expected since it is a key component for most geostationary communication satellites. I hope NEC enjoys further business success; they dominate the market for the attitude sensor guided by infrared rays from Earth that is used in communication satellites. As I'm involved in editing a book by Prof. Kuninaka, who was responsible for developing the ion engine used in Hayabusa, I hope young researchers, in particular, will pay more attention to this area.



Yoshiaki Ohkami  
Director, SDM Research Institute  
Dean, Graduate School of  
System Design and Management

## News

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### PM beginners seminar for Japan Aerospace Exploration Agency (JAXA)

The Project Management beginner's seminar was held on July 8 and 9, 2010 at JAXA's Tokyo Office in Marunouchi, Tokyo. This is the third SDM seminar sponsored by JAXA, but the first to be held in Tokyo (at JAXA's request).

Twenty three young JAXA employees came to hear SDM lecturer Yoshikuni Takahashi speak. More time was allocated to group discussion this time, which led to a lively discussion among colleagues in various departments that don't have a chance to communicate on a regular basis. Participants always discover new aspects to their projects through such discussions.

After the course, quite a few enthusiastic participants asked Prof. Takahashi for advice on their specific work. By popular demand, Prof. Takahashi will give a lecture at JAXA in the future.



JAXA employees in group work



Lecture by Prof. Takahashi

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## JB Press features policy proposal by Prof. Yasui's study group



**JB** Press, one of the largest web-only media companies, featured “Insurance industry in 2020,” a six-part series of insurance policy proposals on their website from July

5 to 12. Shunpokai, a study group chaired by Prof. Toshiyuki Yasui, consists of a dozen young savvy insurance professionals who have been meeting regularly after work for over a year to discuss which strategies the insurance industry should take as part of the core growth strategies being considered by Japan’s financial industry.

The first segment introduced familiar system thinking methodologies in SDM, including the

importance of a systems approach and growth analysis using the competitive intelligence method. In later segments, innovative analyses and proposals, such as insurance sales over cell phone channels, were proposed and the possibility of exporting Japanese insurance systems was discussed.

Visit the website below to read the six-part series.

discussed.

Visit the website below to read the six-part series.

► <http://jbpress.ismedia.jp/articles/-/3883>

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## Visit to a megabank's dealing room

Ten SDM students and professors visited the dealing room at Sumitomo Mitsui Bank Corporation (SMBC), one of the three megabanks in Japan, on July 5, 2010. The visit was organized by the Informal Study Group on Financial Regulation and Supervision in the Socio Critical System Lab.

Following the briefing on the organization and functions of the Treasury Unit, the participants visited the bank's dealing room where various financial trading functions are handled around the clock, including foreign exchange, interest, funds, and derivatives, and then attended a Q&A session with SMBC executives.

SMBC's dealing room applies systems approaches to realize efficient and effective operations, such as computerizing communications between



Briefing



Visitors with SMBC executives

branches, and elimination of departments with overlapping roles. The participants, most of whom are engaged in the research of financial

systems as typical social technology systems, eagerly took notes during the visit.

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## INCOSE International Symposium 2010

The 20th International Symposium of the International Council on Systems Engineering (INCOSE) was held on July 12-15 in Chicago, USA. From SDM, Prof. Yoshiaki Ohkami, Prof. Takashi Maeno, Associate Prof. Naohiko Kohtake, Associate Prof. Seiko Shirasaka, and Assistant Prof. Sun Kim participated in the presentations on research and the discussions on various topics relating to systems engineering research and education. The Symposium, a collaboration between academia and industry, attracts more participants from industry than other academic conferences and conventions do. Therefore, in addition to around 100 research presentations, various business-related sessions are held; 17 tutorials (Certified Systems Engineering Professional, Modeling with SysML, and Lean Enablers for Systems Engineering etc.) on how to apply systems engineering concepts into business, 38 working group meetings (Information Systems, Space Systems, and Knowledge Management, etc.), and meetings by region, such as Europe, US and Asia. Region

VI, composed of INCOSE chapters in Asia, Oceania, and the Middle East, met to discuss the policies to promote systems engineering research and education in the region and the possibility of holding an INCOSE international symposium in Japan. Prof. Ohkami, the president of the Japan chapter, expressed interest in holding a symposium in Japan in 2013. The next INCOSE International Symposium will be held in Denver, Colorado, USA in 2011.

Ahead of this year's symposium, BKCASE, the workshop on Systems Engineering Body of Knowledge and Graduate Reference Curriculum for Systems Engineering, was held on July 7 and 8 in Chicago. (BKCASE stands for Body of Knowledge and Curriculum to Advance Systems Engineering.) Associate Prof. Kohtake and Associate Prof. Shirasaka attended the workshop to discuss their experiences in research and education at SDM and current related issues.



Exhibition

Related links:

20th Annual INCOSE International Symposium

► <http://www.incose.org/symp2010/>

BKCASE

► <http://www.bkcase.org/>

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## ISSS 2010 Conference



Keynote lecture

Prof. Takashi Maeno, Associate Prof. Naohiko Kohtake, and Associate Prof. Seiko Shirasaka from SDM attended the 54th Meeting of the International Society for the Systems Sciences (ISSS) held at Wilfrid Laurier University in Waterloo, Canada on July 18-23, 2010. Established over 50 years ago, ISSS is devoted to system science, system thinking, and soft systems methodology, crossing the academic disciplines of technologies and social

science. Therefore, many of SDM's research and education topics are of interest to ISSS. The three SDM professors attended workshops and meetings to discuss various system-related topics. Prof. Shirasaka reported on the approach, achievements and issues of SDM's Introduction to Systems Engineering course. Prof. Kohtake reported on SDM's 'System Design and Management', features of SDM's educational curriculum, and its achievements and issues to



Prof. Shirasaka speaks in the meeting

Related links:

54th Meeting of the International Society for the Systems Sciences

▶ [http://issss.org/world/Waterloo\\_2010](http://issss.org/world/Waterloo_2010)

The International Society for the Systems Sciences (ISSS)

▶ <http://issss.org/>

date. Many participants from various countries showed keen interest in the innovative education and research activities of SDM. The conference also provided opportunities for SDM to plan new information sharing and joint research with universities abroad.

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## Open lecture "Reading Honey" in Keio System Management Course

An open lecture called "Extreme speed-reading - Six steps in Reading Honey" was held as a part of Keio's System Management Course on July 24. Jointly hosted by SDM and Nikkan Kogyo Shimbun, this was the second time that Keio's System Management Course has offered Reading Honey to the public. Lectures and exercises for Reading Honey are also offered in SDM's Communications course.

The popular but expensive six-hour seminar was filled with participants from the business world. Comments from the participants of the seminar

held at the Collaboration Complex included "It taught me how to get information effectively in a society deluged by information" and "It is a good course for people who wants to read books but do not have enough time."

The Keio System Management Course will continue to offer open lectures on other topics as well as Reading Honey lectures on a regular basis.

Keio System Management Course official website

▶ <http://www.kibanken.jp/keio/>▶ <http://www.sdm.keio.ac.jp/news/2010/05/31-104404.html>TOPIC  
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## GLOGIFT2010



Keynote lecture by Prof. Thong Ngee Goh, National University of Singapore

GLOGIFT2010, an international conference on flexible system management, was held at the Collaboration Complex on July 26 and 27. It was jointly hosted by GCOE Program and SDM. GLOGIFT originated in India as a research com-

munity on flexible systems. A total of 60 people from various countries, including India, Japan, Taiwan, and the US attended the conference for various research presentations and active discussions on systems. From SDM, Prof. Ohkami, Prof. Yasui, Associate Prof. Kohtake, and Assistant Prof. Minato presented their research. Akihiro Sakaedani and Yosuke Nakajima, two graduates of the SDM master's course this past spring who currently work as researchers at SDM Research Institute, also presented their research. For the first time, student sessions featured SDM doctoral students; Mr. Seki from Prof. Nishimura's lab, Mr. Hayashida from Prof. Maeno's lab, Mr. Kusuda from Prof. Ogi's lab and Mr. Yudha from Prof. Nakano's lab presented their research. Of the 12 presentations made by

Indian and Japanese students, Mr. Seki received the GLOGIFT2010 best student thesis award for his work: "Planning of Distributed Design Strategy with Design Structure Matrix / Domain Mapping Matrix."



Discussion between Prof. Sushil, Indian Institute of Technology, and Prof. Ohkami

## Lab profile

Science and Technology System Laboratory

Professor Taketoshi Hibiya

After working as a research fellow in NEC's Fundamental Research Laboratories and as senior researcher for Space Technology Corporation, Professor Taketoshi Hibiya was invited to the Tokyo Institute of Technology as visiting professor and to the Department of Aerospace Engineering at the Graduate School of System Design, Tokyo Metropolitan University as professor. He joined SDM when it was established in April 2008. He is an IEEE fellow and a member of Science Council of Japan. His specialties are material science, material process science, microgravity science, and systems engineering.



### 1 Systems Engineering

Prof. Hibiya has been involved in the research and development of electronic and photonic crystal materials, and has been engaged in research on material processes under microgravity conditions in space. Scientific and technological experiments under microgravity conditions are conducted in airplanes in parabolic flight, in miniature rockets, and in space stations. Because experiments under microgravity conditions require the support of various stakeholders with different beliefs and decision-making methodologies, unlike normal scientific experiments which can be conducted in a closed laboratory, researchers must possess problem solving skills and the ability to understanding multiple viewpoints. Here are some of the laboratory's recent research topics.



Laboratory members

### 2 Thermophysical property measurement of high temperature melts in the European module in the International Space Station

Study of thermophysical property measurement of materials such as melted metal and semiconductors using the equipment boarded in the European module in the International Space Station has been proposed as a 2011 joint research by Japan, Germany and Italy. Students are also involved in research on the optimization of measurement conditions in the microgravity conditions in an airplane in parabolic flight. Numerical fluid mechanics calculation is one of the most important tools, for it is necessary to optimize the atmospheric control in aircraft experiments in which the acceleration of gravity changes over time. Prof. Hibiya will also study the motivation of students who participate in these projects. Keio University Graduate School of Science and Technology, Tokyo Metropolitan University, Gakushuin University, Ulm University in Germany, German Aerospace Center, and the Italian National Research Council collaborate on this research.



International Space Station ©DLR

Electromagnetic flotation of molten silicon

### 3 Development of software platform for thermophysical properties measurement

The joint research "Software development to support the thermophysical properties measurement of ultrahigh temperature materials" with Tohoku University, Gakushuin University, Tokyo Metropolitan University and Ulvac-Riko, Inc, etc. is a Development of Systems and Technology for Advanced Measurement and Analysis project. As a part of the project, this laboratory is in charge of building a software platform to measure thermophysical properties. The lab proposes to concurrently develop hardware and software to globally market the excellent measurement technologies being developed in Japan. The research is jointly conducted with Associate Prof. Keiko Shimazu.

### 4 Ukiyoe art database development

Identifying when cultural artifacts were produced is integral to the study of cultures and their relevance to each other. In the case of identifying Ukiyoe (pictures of the floating world) woodblock prints, which depict beautiful women, capturing data from the Yoshiwara Saiken, a guidebook on prostitutes and related social background information that was issued twice a year in the Edo Period, is essential. This research involves creating a database of the names of the courtesans listed in Yoshiwara Saiken and the textual information found in Ukiyoe paintings and then developing a system to enable searches for information to easily identify when each Ukiyoe woodblock print was created. This joint research is undertaken by Associate Prof. Keiko Shimazu, Jissen Women's Educational Institute and Kyoritsu Women's University.

### 5 Research on business models brought about by technology innovation and rule

Technology innovation and the resulting changes to rules tend to lead to the development of new business models. Business students in the doctoral course are mainly involved in research on various models, including the interdisciplinary collaboration needed for airline seat reservation systems, IDM-foundry collaboration in the semiconductor business, and collaboration between data centers and greenhouses to reduce CO<sub>2</sub>. The lab is also engaged in research on the simulation of the optimal deployment of ambulances and the shortest journey times, which are important elements of a safe and secure society. The introduction of indoor positioning systems is expected to improve safety and security in society as well.



The Science and Technology System Laboratory is collaborating on a wide range of activities with INSPIRE (Information Systems Perspective Investigation and Requirement Engineering) Laboratory, the Semiconductor Technology Laboratory, and the Strategic Social Education System Laboratory in the SDM Research Institute.



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