



ALPS 2010 group photograph

## Message from the Director and Dean

It gives me great pleasure to address you at the start of a new year. I hope that this will be a year of great development and advances for all of you.

We have entered the second decade of the 21st century, carrying with us enormous issues to address: the economy, national finances, jobs, the environment, and security. There are many who bemoan a decline in the energy and enthusiasm of our youth and see dangers in Japan's future, but in strategic systems engineering, we see this as a time to put our best foot forward and tackle new challenges and capture possibilities.

At the end of last year, Keio University was honored with a visit from US Ambassador John V. Roos, who gave us an encouraging message that I would like to share with you. The ambassador said that Japan is a country that shares the democratic value of the free market economy, has an educated population, has a culture that values work, and has enormous amounts of capital. There is no need to be even the slightest bit pessimistic. (Mainichi Shimbun, January 9, 2011) He went on to talk about the many tangible and intangible assets that we have, from our natural environment to our high ethical standards, and he encouraged us to open the way to a new future by giving strong incentives to young people, entrepreneurs, and women and designing policies and programs to help them make a difference.

This is the direction that the Graduate School of System Design and Management wants to go, and I'm confident that our presence and role will only grow in the future. The faculty at the school is as committed as always to taking on this challenge, and we look forward to your guidance and support.



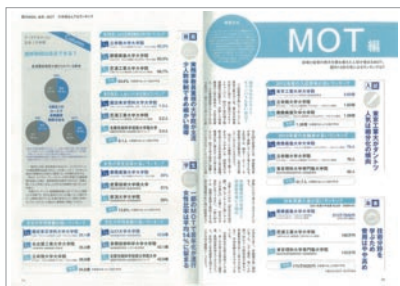
Yoshiaki Ohkami  
Director, SDM Research Institute  
Dean, Graduate School of  
System Design and Management

## News

TOPIC  
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### SDM earns high marks in supplement issue of Nikkei Human Resources Magazine

SDM was given high marks in the "Graduate School Rankings: MOT" section of the 2011 edition of "MBA, CPA, MOT Perfect Book," a special supplement issue from Nikkei Human Resources Magazine (Nikkei HR/October 2010).



Entrance exam multiple	<b>3rd</b> (1.59 X)
Acceptances	<b>1st</b> (74)
Tuition	<b>1st</b> (first year 2,137,600 yen)
Percentage of full-time teaching staff with real-world experience	<b>2nd</b> (83.3%)
Ratio of female students	<b>1st</b> (24%)

▶ <http://www.sdm.keio.ac.jp/news/2011/01/07-125624.html> Click here for the article (Japanese) ▶ <http://www.sdm.keio.ac.jp/news/pdf/mook20110106.pdf>

## Notice

### Call for themes and proposer companies for ALPS 2011

The theme for the AY2011 Design Project ALPS (Active Learning Project Sequence) will be "Symbiosis and Synergy."

SDM is seeking project themes related to "Symbiosis and Synergy" and plans to use them to propose new ideas in AY2011 ALPS.

Is there a social or organizational problem you wish to address? Something difficult that you can't address in your normal, day-to-day activities? A medium and long-term task you need to accomplish? Would you be interested in working with our graduate students to find solutions? More details on the call for themes will be published soon.

▶ <http://www.sdm.keio.ac.jp/en/collaborations/alps.html> (Ref.) AY2010 pamphlet ▶ <http://www.sdm.keio.ac.jp/en/pdf/alps2010.pdf>

The AY2010 Design Project ALPS (ALPS 2010) sponsored by The Norinchukin Bank held its fifth workshop on November 19 and 20, which was followed on December 13 by a discussion with ALPS students and reports to companies proposing themes for the year's topic, "safe and secure system design".

The discussion with students featured five students and a total of eight teaching staff, including Dean Yoshiaki Ohkami, Professor Shinichiro Haruyama, and Assistant Professor Sun Kim. The students learned a great deal in ALPS. Asked about the program's strengths, they shared the following comments:

- Solicitation of themes from proposer companies
- Course structure
- Workshops are logically sequenced and explanations are easy to understand
- Simulated project experience
- Lecturers from MIT, Stanford, TU Delft and SDM
- Experience taking classes and giving presentations in English
- More or less monthly meetings with proposer companies and lots of feedback
- Participation of proposer companies makes it easier to maintain motivation

They also noted some problems:

- Large gaps within the teams in English ability and comprehension, with the gaps only widening as the workshops progressed
- Large amount of work and effort for team management

- Excessive assignment load

They offered proposals too:

- Could themes be freely selected?
- After admission and prior to the commencement of ALPS, participants' English ability should be subject to a strict check, with training provided as needed.
- Consider a test to ensure that individual students have an adequate understanding
- There should be mechanisms to assess the degree of effort put into ALPS projects and demonstrate the growth achieved
- For newly-graduated students, ALPS would be more interesting if it were reworked to provide an internship-like experience

Reports were also furnished to companies that proposed themes related to the year's topic of "safe and secure system design." After the reports, there was an opportunity for discussion between the 12 representatives of proposer companies and 11 members of the SDM teaching staff.

Opinions received from the proposer companies include:

- Student reports delved deeply into the subject matter
- Students rigorously analyzed and provided proposals for difficult themes
- Mailing lists enabled excellent communication between students, proposer companies, and mentors
- It is difficult to balance the creative ideas of students and the expectations of companies
- It is difficult to understand how proposer compa-

nies should provide support

- Students need to understand that, inside a company, if they fail in a project they probably will not get a second chance
- There should be a mechanism for donations of scholarships and other funding from companies

We look forward to using these opinions to improve ALPS in the future. We would like to thank everyone who participated in and provided cooperation for ALPS 2010.



Meeting with proposer companies



Group photographs for ALPS 2010 (one group on the cover)

## TOPIC 3

## Intensive lecture by Professor Rashmi Jain



In the classroom

Professor Rashmi Jain (Stevens Institute of Technology) gave an intensive lecture on “System Architecture and Design” and “Systems Integration” on December 13 - 15 and December 16 - 20, respectively. Each series was attended by approximately 25 students.

In the first series of lectures on system architecture and design, students learned about the processes to be followed before breaking into group work on the topic of ATMs. They were given a requirements document, from which they were asked to identify the functional architecture

and then investigate ways to further improve system functions. The second series of lectures focused on group work on the topic of systems integration for hybrid vehicles. Students learned about subsystem input/output relationships and interfaces. Clear lectures and appropriate group work made this an extremely satisfying experience for all who participated.



Professor Rashmi Jain

## TOPIC 4

## Report on Systems Integration 2010



Presentation by Assistant Professor Yasutoshi Makino

The Systems Integration Division of the Society of Instrument and Control Engineers held a lecture series from December 23 - 25, 2010 at the Tohoku University Kawauchi Campus.

Participating from SDM were Professor Takashi Maeno, Assistant Professor Yasutoshi Makino, masters course students Saki Morishima and Miki Nishio, and SDM Research Institute researchers Konyo, Nakaya and Watanabe. During the series, they presented the latest research into the design of communications robots and human sensory mechanisms. They were able to enjoy a white Christmas in Sendai, actively discussing and debating with colleagues at other universities and corporate researchers while the snow fell. Nonetheless, “systems integration” in the context of this Society did not go beyond the level of structuring robots and other systems. If anything,

we reconfirmed the importance of the approach to systems integration taken by SDM in which we break down systems before integrating, verifying, and validating them.



Presentation by Saki Morishima

## TOPIC 5

## Book by Professor Toshiyuki Yasui reviewed in “Nikkei Business”



Professor Toshiyuki Yasui’s book “The China-Taiwan Conflict: What Seething Nationalism Holds in Store” (Chuokoron-Shinsha, 2005) was reviewed in the “The New and the Good in Books” column of the December 13, 2010 edition of “Nikkei Business” (reviewer: Tomoyuki Isoyama, member of the editorial board).

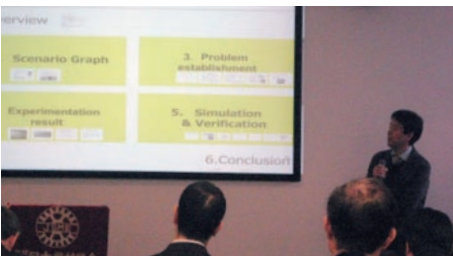
The source is found as follows.

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**Publisher:** Nikkei Business Publications  
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Click here for the article (Japanese) ▶ <http://www.sdm.keio.ac.jp/news/pdf/20101213NikkeiBusiness-BookReview-Isoyama-YasuiBook.pdf>

## TOPIC 6

## Nakajima and Yagita present at ICBTT2010



Presentation (Madoka Nakajima)



Presentation (Hiroyuki Yagita)

The 5th International Conference on Business and Technology Transfer (ICBTT2010) was held at the National Railway Museum in York, England from December 2 to 4, 2010. ICBTT is an international conference for researchers who are investigating how to effectively transfer technology and management practices in the areas of manufacturing, business administration, and human resources development. Two SDM students, Madoka Nakajima (2nd year doctoral course) and Hiroyuki Yagita (2nd year masters

course) made a presentation titled “System design approach derives new type of insurance”. Mr. Yagita commented, “It was the first time I had submitted a paper, and it was an uphill battle trying to complete it. I was extraordinarily happy when the paper was accepted. We had 15 minutes to present, and we used a combination of prezi and video clips to make sure the audience wasn’t bored. We received some nice comments. I’m excited about doing more research.”



Cold snap in UK

## Laboratory Profile

### INSPIRE Lab: Information Systems Perspective Investigation and Requirement Engineering Lab

Official site (Japanese) ▶ <https://sites.google.com/site/keioinspirelab/>



**Special Research Associate Professor  
Keiko Shimazu**

Worked in the Information System Division and IT Media Research Center of Fuji Xerox Co., Ltd. and as an associate professor at the Research Institute for Digital Media and Content, Keio University before being appointed to current position.

Area of expertise: Information system engineering, applications engineering



**Professor  
Taketoshi Hibiya**

Worked as Professor of system design at Tokyo Metropolitan University before being appointed to current position.

Areas of expertise: System design in large-scale scientific research



**Professor  
Kenichi Takano**

Worked as a senior researcher at the Central Research Institute of Electric Power Industry before being appointed to current position.

Areas of expertise: Risk management and human factors in large technology systems

The INSPIRE Lab was established to conduct multifaceted research on information systems, looking not just at software engineering but also at the hardware aspects and how systems are used. It is led by Special Research Associate Professor Keiko Shimazu, Professor Taketoshi Hibiya, and Professor Kenichi Takano. Four students from the laboratory presented at the national conference of the Information Systems Society of Japan in November 2010, and their papers were well received. Researchers from the laboratory are also scheduled to present on the progress and results of their research at the national conference of the Information Processing Society of Japan scheduled for March 2011.

The INSPIRE Lab holds an alternating series of workshops and seminars every two weeks.



Snapshot after workshop

## Main research activities

### 1 Model driven requirements development

Research in this field aims to develop techniques and technologies to bring to information systems the same framework for safe, stable systems engineering that has been established in the course of large-scale, complex systems development projects. Research into information systems has traditionally taken software engineering or computer science as its basis, but our focus in this laboratory is on the use and operation of information systems, and our goal is optimized design. The requirements development process, in particular, has relied on intuition and experience, but we are trying to develop a more systematic framework. Of particular interest are efficient CONOPS creation and requirements definition and the application of traceability to systems requirements, system architecture, and validation and verification tests.

We also look at increasingly complex systems architecture. The involvement of more stakeholders in information systems has resulted in the need for multiple points of view in system architecture, and research in this area attempts to satisfy requirements in a way that is optimized to resolve conflicting viewpoints. One of our projects is the development of a framework that allows for coherent architecture among differing viewpoints. To do this, we apply a theoretical mathematical concept known as a “consistency constraint algorithm.”

### 2 Information architecture and information system architecture

Information systems have become an indispensable tool for industry, but in most cases they are extensions of existing systems or integrations of multiple systems. Research into information systems has traditionally taken the perspective of software engineering or computer science, but there has been little done on extensibility and integration. The INSPIRE Lab looks at this problem in terms of the optimization of information architecture, or how to support the optimization of information system design after extension and integration. Information architecture was developed in Europe as a methodology to take mere data and share it as something valuable. Our goal is to extend these concepts to the design of information systems.

### 3 Human error and information system problems

In Japan, the IT industry is touted as being the new 3K (from the words kitsui, kitanai and kiken: demanding, dirty, and dangerous) and has difficulties in recruiting and training talented personnel. The INSPIRE Lab uses member aptitude testing, quantification of individual mission objectives, and coaching as strategies to reduce system failures due to human error.

### 4 Applying results to real-world systems

The INSPIRE Lab emphasizes “real world oriented” research. We want our theoretical and experimental results to contribute to the development of actual information systems.

To date, three of our projects have made it into real systems.

- Semantic search engines
- Laboratory automation
- Integrated query system for cultural artifact archives

### 5 Competitive funding awarded to members

Scientific Research Subsidy basic research (C)

Scientific Research Subsidy basic research (B)

Japan Science and Technology Agency Advanced Measurement and Analysis Technology Development Project



Laboratory workshop



Servers used in laboratory experiments



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\* Please put "SDM Research Institute" in the subject when communicating by fax or e-mail.

**SDM**  
System Design and Management