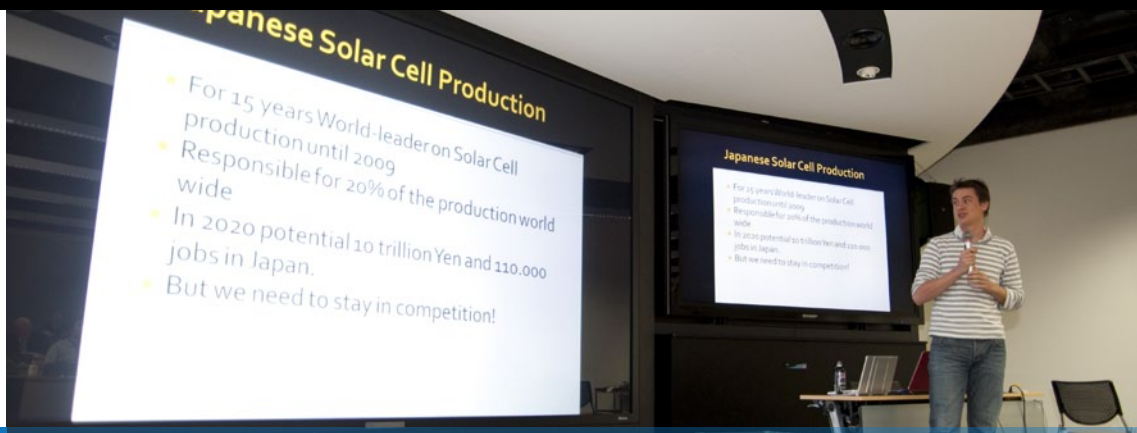
SDM
System Design and Management
NEWS

February 2010



Presentation by Mr. Frank Pijnenborg, exchange student from Delft University of Technology, the Netherlands

Message from the Director and Dean

In the January edition of the SDM News, I reported that Japan had lost out to Korea in an international bid to build a nuclear power plant in the United Arab Emirates (UAE). In the early February, we learned that a Japanese group also lost to Russia in an international bid to build a nuclear power plant in Viet Nam. These repeated failures appear to have motivated the government to take action. If we are to solve the problems confronting us, it is urgent that we train people who are capable of acting on the international stage, and that is one the main focuses here at the Graduate School of System Design and Management (SDM). It is not enough to be an expert in your field. You have to bring the entire package, which means having negotiation skills and also spending years building up networks of friends and sources of information. Our objective at SDM is to develop people who are capable of functioning overseas. Since our inception in April 2008, we have pursued ties with MIT and Stanford University in the United States that have resulted in the Active Learning Project Sequence (ALPS) and other initiatives. We are also deepening our relationships with Delft University of Technology in the Netherlands and the Swiss Federal Institute of Technology (ETH). We look forward to the advice and guidance of the companies and enterprises that so generously support SDM.

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

News

TOPIC 1

Final presentations by exchange students from Delft University of Technology

On Thursday, January 21, exchange students from Delft University of Technology in the Netherlands presented their results from their stay in SDM. On stage were three students from the University's Faculty of Technology and Policy Management with which SDM has signed a comprehensive partnership agreement, Annemarijn Jelsma (Anna), Frank Pijnenborg and Derk Busser. Their half-year stay in Japan began in the summer of 2009. They pursued their own research while here, developing their own perspectives on the country, which they related to the audience, complete with humorous photographs.

Anna took the Introduction to Systems Engineering course while at the SDM. She talked about her experience being appointed the project manager for a product development project that was undertaken as part of the class and how she was able to lead a multinational team to success. Like Anna, Frank joined Professor Masaru Nakano's Business Engineering Research Center. He focused on the government of Japan's strategy for solar cells, applying system dynamics to analyze projections for indium resources as CIGS thin-film solar cells spread. The final presenter, Derk, was a member of the Aerospace & Intelligent Systems Laboratory. He talked about his experiences contributing to the development of an indoor/outdoor seamless positioning information system. The system was demonstrated to the Minister of Education, Culture and Science of the Netherlands when he visited.

Particularly interesting were the students' impressions of the "laboratory" system employed by SDM for student guidance. Direct, careful instruction from professors was very attractive to them and not something available in Dutch universities. We wish them all the best on their return to the Netherlands and hope that they will remain in contact with the students and faculty staff of SDM.

Presentations
(Derk top, Anna bottom left, Frank bottom right)

TOPIC 2

Student project awarded the Kanto Bureau of Economy, Trade and Industry Director-General's Prize in the Campus Venture Grand-Prix

CVG Tokyo awards ceremony

The members of "Roppongi Vege&Fruit Corporation," a project to make use of former school buildings in Tokyo that emerged out of Team-A2 in ALPS2009, competed in the 6th Campus Venture Grand-Prix (CVG; sponsored by The Nikkan Kogyo Shimbun, Ltd.). Out of a field of 106 contenders, it was selected for the Kanto Bureau of Economy, Trade and Industry Director-General's Prize in the Tokyo finals. The team had 12 members: Hiroyuki Yagita, Madoka Nakajima, Hisaya Katoh (JAXA), Song Jue, Naoko Daigo, Masaki Hokari, Ryuta Ohashi, Tomoya Kase, Koichi Takahashi, Shinya Nomura, Naoyuki Higo and Yasuhiro Matsuo). They were also chosen to compete in the nationals scheduled for Wednesday, March 3.

In addition, they entered the 8th Student Entrepreneur Grand Prix (sponsored by the Tokyo Metropolitan Government) and are among the final 10 teams out of a total of 230 competing. Final presentations will take place on Sunday, February 7 at Tomin Hall in the Tokyo Metropolitan Government Building.


With Mr. Yoshio Ichiryu of Associates, Inc. and Mr. Kiyonari Tadao, former President of Hosei University

Project member comments

Hiroyuki Yagita (leader)
1st year, masters course (entered April 2009), ALPS-A2

I am very grateful to the members of ALPS-A2 and those who joined the team after the conclusion of ALPS. This prize is a great honor, and it was only possible because we were able to bring together a wide range of people who are willing to work enthusiastically, seriously and enjoyably. I want to continue to serve as an enhancer, encouraging cytodifferentiation in the team! (Quoting from a presentation on system life theory)

Madoka Nakajima
1st year, doctoral course (entered April 2009), ALPS-A2

The impetus to join the two competitions was an e-mail from Assistant Professor Sun Kim titled "Competition Opportunity Assistant for ALPS projects." During the latter half of ALPS, the project really began to be fleshed out and we decided we could polish it up even further and submit it. At first, we undertook it rather lightheartedly, but having come this far, we are going to do everything we can to be victorious.

Naoko Daigo
2nd year, masters course (entered September 2008), ALPS-A2

There is an incredible diversity in the people at SDM, and ALPS was a valuable experience in confronting challenges and learning from them. I look forward to working with my great friends here to carve out a new tomorrow.

Masaki Hokari
1st year, masters course (entered April 2009), ALPS-A2

Under our very capable and reliable leader, we forewent our summer vacations last year in favor of repeated meetings, and it is very gratifying that our work has been given such high marks not only within the school but also in the entrepreneur championships. I am not sure I contributed much to the team, but I am honored to be a member and want to thank my teammates for including me.

Hisaya Katoh
Research student (JAXA), ALPS-A2

We have a great team and were able to experience the entire process of moving a simple idea up to the point of being a feasible project. I am grateful for this useful and valuable experience.

Song Jue
1st year, masters course (entered April 2009), ALPS-A2

We share happiness and woe during the project, and I realize "Many hands make light work" immediately.

Ryuta Ohashi
2nd year, masters course (entered April 2008)

Diverse team members. The dispersion and concentration techniques we learned together. Working hard as a team on the project. I tried to break down the elements in the prize. I am very glad to have had the experience of integration with all of you and for our work to be recognized in this award.

Tomoya Kase
1st year, masters course (entered April 2009)

We had a wonderful group of professors teaching us ALPS techniques, and it was very gratifying to see the combination of these techniques and enthusiastic team members produce results. This has been an extremely valuable and enlightening experience for a new university graduate like me. I look forward to doing even more in the future.

Shinya Nomura
1st year, masters course (entered April 2009)

We moved from the classroom ALPS (Active Learning Project Sequence) to the practical ALPS (A Lot of Practical Solutions). And now we are just one step away from the project seeds budding as an enterprise. I hope to keep rooting for the team to safely cross the Alps.

Naoyuki Higo
1st year, masters course (entered April 2009)

I joined the project midway through, but it was still a valuable experience to see how people from the wide range of backgrounds we have at SDM cooperate together and, through a series of trial and error, apply what we have learned to the creation of a new project. I hope to use this experience to contribute to society.

Yasuhiro Matsuo
2nd year, masters course (entered April 2008)

It was eye-opening for me to participate in an outside event and I was able to come to understand more perspectives. I also feel like I am getting closer, one step at a time, to my dream of being an entrepreneur.

See the SDM website for details.
- http://www.sdm.keio.ac.jp/news/2010/02/03-165350.html
- http://www.sdm.keio.ac.jp/news/pdf/4025p.pdf


Celebrating in Roppongi

TOPIC 3 Associate Professor Kohtake to write a monthly article for ITmedia Executive

Associate Professor Naohiko Kohtake is writing a series of articles on "system design and management" for the ITmedia Executive site. The first was published on January 27, 2010. The title of the article is "Overcoming Failures: Why Does Japanese Space Development Continue to Succeed?" and it relates his experiences in the space industry from the perspectives of a young researcher in a way that is both exciting and thought-provoking.
Next month will feature an introduction to system design and management based on systems engineering, which will use concrete, real-life examples to articulate the need for system design and management techniques. We look forward to more great articles in the future.

ITmedia Executive
▶ http://mag.executive.itmedia.co.jp/
Below are the article details.
▶ http://mag.executive.itmedia.co.jp/executive/articles/1001/27/news007.html


Associate Professor Naohiko Kohtake

TOPIC 4 January 30 research topic presentation

Presentation by Mr. Tomas Dall'Agnese

On January 30, 2010, masters students entering in the 2009 fall term presented their research topics (there were also some interim presentations from masters students and research presentations from doctoral students). Research topic presentations are an opportunity for students in their 1st term to provide an outline of the topics they wish to address in their master's thesis (system design management research). A total of about 40 students and faculty staff participated. They heard presentations on an extraordinarily wide range of subject matter, from remote image transmission technology to environmental measures, organizational management, corporate groupings and music business models. A lively question-and-answer session followed.

TOPIC 5 Professor Sasaki receives the 2010 IEEE Daniel E. Noble Award

Professor Shoichi Sasaki, together with two joint recipients, was selected by the Institute of Electrical and Electronics Engineers (IEEE) for the 2010 IEEE Daniel E. Noble Award. The award was "For pioneering contributions to the development and market penetration of hybrid electric vehicles (HEVs) through the establishment of innovative architectures and control technologies." It is presented each year to individuals or groups of no more than three researchers who make significant contributions to contemporary new technologies.

▶ http://www.ieee.org/portal/pages/about/awards/pr/noble.html

TOPIC 6 Emiko Tsuji (2nd year masters student) wins the 2009 IEEJ Excellent Presentation Award

Ms. Emiko Tsuji, a 2nd year masters student in Professor Shoichi Sasaki's laboratory, was awarded the IEEJ Excellent Presentation Award by the Power and Energy Society of the Institute of Electrical Engineers of Japan.

Ms. Tsuji's paper was entitled "Effect of Sharing Battery Set with Photovoltaic System," and was presented in person to the 2009 meetings of the Power and Energy Society of the Institute of Electrical Engineers of Japan, where it was widely praised.


Mr. Murakami and Mr. Wakasugi (joint researchers at the Institute of Electrical Engineers of Japan) with Ms. Tsuji and Mr. Seto

Lab profile

Symbiotic System Design Laboratory

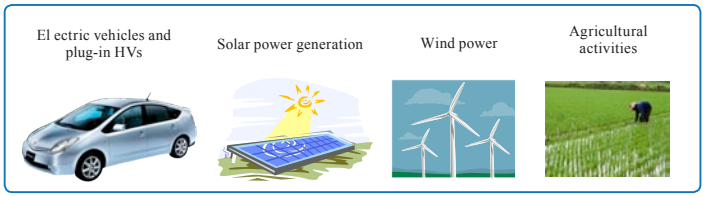
Professor Shoichi Sasaki

Formerly Toyota Motor Corporation
Areas of expertise: Design of environmental and symbiotic systems
Books and Publications: "Permanent Magnet Motor Control Technology for Hybrid Vehicles," Triceps,
one of the main characters .in a Japanese comic, 'Wings of Prius' Minister of Economy, Trade and Industry Award by Japan Institute of Invention and Innovation, 2004
2010 IEEE Daniel E. Noble Award

Overview

Conventional mobility relies on automobiles driven by internal combustion engines, which are powered primarily by petroleum-based fuels. However, environmental constraints and resource constraints require the development of new mobility tools and systems.

In this laboratory, we research transportation tools and the systems to support them, with a focus on coexistence with human living spaces. Our scope extends beyond transportation systems themselves to also examine issues in agriculture and plant production in Japan as they relate to bio-energy.



Research topics

Names in parentheses () are students involved in the research

1 System Design of the Symbiosis Community Composed of City and Rural Areas Using the Biomass Energy Technology as the Core Element (Takashi Yamamoto)

Aims

This research investigates ways of realizing the symbiosis of the social community and the biomass recycle system and investigating their effects and problems as part of a larger exploration of the potential using bio-energy and creating new collaboration between urban and rural areas.

Major results

It is difficult to achieve profitability at current costs using biogas transformation technology on its own. The least onerous approach to recovering the investment within a period of 15 years would be an environmental tax of about 20 yen per resident per year.

2 High-Penetration Distributed Photovoltaic System Design (Toshiyuki Seto)

Aims

Techniques of power systems analysis are used to examine the suspension of photovoltaic systems due to rises in electricity grid voltage during the process of mass-market penetration of photovoltaic systems. The findings are then adjusted for the behavioral rules of multi-agent simulation to elucidate the impact of strength of government etc. incentives for this technology.

Major results

The faster the speed with which photovoltaic systems spreads, the larger the number of batteries required. (Battery waste occurs.) If the spread of photovoltaic systems is staggered over time and location, penetration will be achieved more quickly and with fewer batteries by working from locations close to substations outwards than by working from farther locations.

3 Study of Carbon Dioxide Reduction by Sharing Battery Set with Photovoltaic System (Emiko Tsuji)

Aims

Concurrent installation of batteries is one conceivable means of avoiding the suspension of generation due to higher grid voltages, one of the problems encountered in photovoltaic power generation. This research tries to identify reductions in battery volumes with shared use of batteries, based on home electric power consumption patterns elucidated from the living patterns of real-life homes.

Major results

We have found that even in systems that do not allow a reflux of generated power on the grid, the sharing of batteries can result in an increase of up to 4% in generated power. Equivalent effects are expected if the supply and demand balance is controlled in real-time without installing batteries into homes. (Development of smart grids)

4 A Study on Dissemination Process of Farming Experience-Farm using Multi-Agent Simulation (Takeshi Otsuka)

Aims

Farming experience farms are spreading, particularly in urban areas. This research uses interviews with operators to analyze the spread of farming experience farms and identify approaches for more efficient penetration.

Major results

Consumers express a high "satisfaction" with farming experience farms, but also indicate that they "quickly grow tired of them." For greater numbers to participate, first-time participants need to be given experiences that are "exciting and moving," rather than "not becoming bored" programs.

5 Design and Consideration of Plant Factory for Value Creation (Yasuhiro Matsuo)

Aims

Japanese agriculture must address a number of issues, including the lack of successors and questions of food security. Plant factories have received wide attention, and the aim of this research is to apply systematic design techniques to the design of plant factories that are valuable to customers.

Major results

Analysis using QFD, the Pugh Method and other techniques led to the concept of "solar light sources using the natural lighting systems of closed urban schools." Surveys indicate that these systems better meet customer requirements than conventional plant factories.

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