Keith W. Hipel 教授
来日記念シンポジウム

コンフリクトとリスク・ガバナンス研究の
パースペクティブ
Perspectives of Conflict and Risk Governance

日時:　2014 年 3 月 8 日（土）　13:00-18:00

会場:　京都大学宇治キャンパス　きはだホール

KEYNOTE LECTURE

Responsible Governance in a Complex World
A System of Systems Engineering Design

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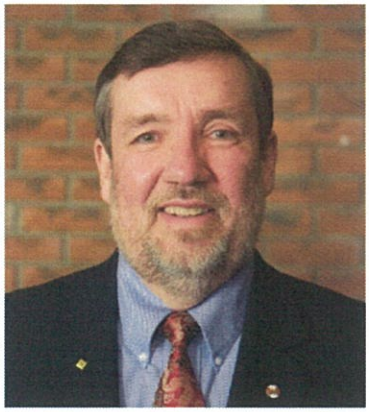

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Keith W. Hipel is *University Professor* of Systems Design Engineering at the University of Waterloo where he is *Coordinator* of the Conflict Analysis Group. He is *President* of the Academy of Science within the Royal Society of Canada, *Senior Fellow* of the Centre for International Governance Innovation, and *Past-Chair* of the Board of Governors of Renison University College. Keith thoroughly enjoys mentoring students and is a recipient of the *Distinguished Teacher Award*, *Faculty of Engineering Teaching Excellence Award*, and the *Award of Excellence in Graduate Supervision* from the University of Waterloo, as well as the *2011 Outstanding Engineering Educator Award* from IEEE Canada. His major research interests are the development of conflict resolution, multiple criteria decision analysis, time series analysis and other decision-making methodologies for addressing challenging interdisciplinary system of systems engineering problems lying at the confluence of society, technology and the environment, with applications in water resources management, hydrology, environmental engineering, energy, and sustainable development. Keith is the author or co-author of 4 books, 11 edited books, more than 260 journal papers, as well as many conference and encyclopedia articles. In recognition of his academic and professional accomplishments, Keith has received 44 awards including being elected *Fellow* of the Institute of Electrical and Electronics Engineers (*FIEEE*), Royal Society of Canada (*FRSC*), Canadian Academy of Engineering (*FCAE*), American Water Resources Association (*FAWRA*), International Council on Systems Engineering (*FINCOSE*), and Engineering Institute of Canada (*FEIC*). Keith is a recipient of the *Joseph G. Wohl Outstanding Career Award* from the IEEE Systems, Man and Cybernetics (SMC) Society, IEEE SMC *Norbert Wiener Award*, *Japan Society for the Promotion of Science (JSPS) Eminent Scientist Award*, and the *Sir John William Dawson Medal* from the RSC. He also received the designation of *Docteur Honoris Causa* from École Centrale de Lille, title of *Doctor Honoris Causa* from Obuda University, *Icko Iben Award* from AWRA, *Outstanding Contribution Award* from the

IEEE SMC Society, *Most Active SMC Technical Committee Award*, *W.R. Boggess Award* from AWRA, and the *University of Waterloo Award for Excellence in Research*. Keith has held a *Canada Council Killam Research Fellowship*, Monbusho Kyoto University Visiting Professor Position, Stanley Vineberg Memorial Visiting Professorship, Centre National de la Récherche Scientifique (*CNRS*) Research Fellowship, and JSPS Fellowships. Moreover, he is a Professional Engineer (*PEng*), recipient of the *Engineering Medal for Research and Development* from Professional Engineers Ontario, and member of the CAE Energy Pathways Task Force. Keith served for two terms as *Chair* of his Department and was a *Member* of the Board of Governors and Senate at the University of Waterloo. He has been highly active in professional organizations such as the Royal Society of Canada, IEEE SMC Society, CAE, Group Decision and Negotiation, and AWRA; is the *Founder* of International Conferences on Water and Environment Research (ICWRER) and is *Chair* of its Steering Committee; and is an *Associate Editor* of many international journals including the IEEE Transactions on Systems, Man and Cybernetics: Systems; Group Decision and Negotiation; and Systems Engineering.

Responsible Governance in a Complex World

A System of Systems Engineering Design

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Abstract

An integrative and adaptive design for Responsible Governance is put forward for addressing large-scale complex problems facing society based on a System of Systems (SoS) Engineering framework that reflects the values of stakeholders using a participatory approach and achieves desirable systems goals such as resilience, sustainability and fairness. To demonstrate that this can actually be accomplished in practice, Singapore is employed as a remarkable example in which the nation was purposefully designed according to sound Systems Engineering principles resulting in a highly respected country that brings prosperity, fairness and fulfillment to its citizens and serves as a beacon of hope for other countries to emulate. In contrast to Singapore's success, a range of tough interconnected systems problems are described for which systems solutions are urgently needed: the failed American financial system, unfair medical systems, unreliable aging infrastructure, self-induced climate change, preparing for extreme weather conditions like hurricane Katrina, fair trade and the electrical

system collapse in North America. As is explained, the underlying cause for underperformance or system collapse in these large-scale problems is a faulty value system. Accordingly, ethical system values reflecting the values systems of stakeholders, including nature and future generations, constitute the solid foundations upon which Responsible Governance is constructed. Extensive research is urgently needed for developing a comprehensive theoretical structure for System of Systems Engineering for suitably solving current and emerging complex systems problems.

Related References

Bristow, M., Fang, L., and Hipel, K.W., "System of Systems Engineering and Risk Management of Extreme Events: Concepts and Case Study", Risk Analysis: An International Journal, Special Issue on the Risk of Extreme and Catastrophic Events, DOI:10.1111/j.1539-6924.2012.01867.x, published online on July 15, 2012, Vol. 32, No. 11, pp. 1935-1955, 2012.

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Hipel, K.W., Obeidi, A., Fang, L., and Kilgour, D.M., "Sustainable Environmental Management from a System of Systems Perspective", In System of Systems Engineering: Innovations for the 21st Century, edited by M. Jamshidi, Wiley, New York, Chapter 18, pages 443-481, 2009.

Hipel, K.W., Obeidi, A., Fang, L., and Kilgour, D.M., "Adaptive Systems Thinking in Integrated Water Resources Management with Insights into Conflicts over Water Exports", INFOR, Vol. 46, No. 1, pages 51-69, 2008.

INVITED LECTURES

Unforeseen Risk and Planning Perspectives:

Prof. Kiyoshi Kobayashi, Kyoto University

Recent Results in Multi-Leader-Follower Games:

Prof. Masao Fukushima, Nanzan University

On the Home Market Effect:

Prof. Dao-Zhi Zeng, Tohoku University

Dr. Kiyoshi Kobayashi

Professor, Infrastructure Economics
Graduate School of Management
Director, Research Center of Business Administration
Kyoto University

Kiyoshi Kobayashi is Professor of Infrastructure Economics, Graduate School of Management and the Director of the Research Center of Business Administration, Kyoto University. He is also Professor of Planning and Management Theory of Graduate School of Engineering, Kyoto University. He was Dean of Graduate School of Management for the period of 2010-2012. He is a world renowned researcher in the fields of Urban and Infrastructure Management and Economics and a recipient of several awards including the Distinguished Research Awards by Japan Society of Civil Engineers, Fellow Awards by RSA International, and Education Awards by the Danish Ministry of Environment and The Vietnamese Minister of Education. He experienced the President of the Applied Regional Science Conference, Global Business Society and serves on the editorial boards of international journals including the American Society of Civil Engineers, Annals of Regional Science, the series editor-in-chief of the Journals of Japan Society of Civil Engineers and the Journal of Applied Regional Science. Currently, he is a member of National Land Development Council of Japan, a committee expert on Transport Policy Council of Japan, and a coalition member of Science Council of Japan. He was an adjunct professor of 10 oversea universities and a visiting fellow of international organizations of OECD, WHO, and World Bank, etc. He is the author and co-editor of 55 books and over 380 academic reviewed papers.

Unforeseen Risk and Planning Perspectives

Kiyoshi Kobayashi

Infrastructure Economics
Graduate School of Management
Director, Research Center of Business Administration
Kyoto University

Abstract

In the traditional methodology of risk management, a widely accepted practice is to seek rational means to maneuver anticipated risks in a rational way while excluding uncertain events whose probabilities are sufficiently low. The extensive damage caused by the Great East Japan Earthquake revealed the ineffectiveness of existing views on risk management in the area of unforeseen risk. Based on the assumption that all planning and analysis activities are impossible without prior anticipation, this paper presents basic views on the philosophy of risk analysis and its ability to transcend the wall of cognition. In addition, based on the viewpoint of post-positivism, this paper examines the risk communication that occurs between experts and non-experts. It also recommends goals that risk analysis should strive for. Finally, it highlights practical issues that might occur in infrastructure planning and examines challenges inherent in infrastructure planning and management.

Dr. Masao Fukushima

Professor, Faculty of Information Systems
and Engineering
Nanzan University

Masao Fukushima obtained all academic degrees in Engineering from Kyoto University. Currently he is a full professor at the Faculty of Information Systems and Engineering, Nanzan University, and professor emeritus at Kyoto University. His research interests include nonlinear optimization, variational inequality and complementarily problems, parallel optimization, nonsmooth optimization, global optimization, game theory, and applications in transportation, finance, data mining, etc. He has published over 200 papers in peer reviewed journals and has been selected as an ISI Highly Cited Researcher in Mathematics. Professor Fukushima is one of the founders of the Pacific Optimization Research Activity Group, and had served as the Chairman of the Working Committee. He is also the founder and the Co-Editor of Pacific Journal of Optimization. Besides, he is currently on the editorial boards of 15 international journals in optimization and operations research, including Computational Optimization and Applications, Optimization Methods and Software, Journal of Optimization Theory and Applications, etc.

Recent Results in Multi-Leader-Follower Games

Masao Fukushima

Faculty of Information Sciences and Engineering
Nanzan University

Abstract

Equilibrium problems with equilibrium constraints (EPECs) play an important role in modeling complex 'equilibrium problems' such as non-cooperative multi-leader-follower games that arise, for example, in economics and engineering. In this talk, we discuss some issues in studying EPECs, and then particularly mention our recent result on a class of multi-leader-follower games under uncertainty with some special and simplified structure. By means of the robust optimization technique, the game is first formulated as a robust Nash equilibrium problem, and then a generalized variational inequality problem. A numerical method is presented to compute a solution of the game.

Dr. Dao-Zhi Zeng

Professor, Graduate School of
Information Sciences
Tohoku University

Dao-Zhi Zeng is a professor of Graduate School of Information Science at Tohoku University since 2008. He learned applied mathematics in his undergraduate and master's program of science in Huazhong University of Science and Technology in China. He was awarded a Doctor of Engineering in Graduate School of Engineering of Kyoto University in 1996. He worked at Kagawa University as a lecturer, associate professor and a full professor in economics between 1996 and 2008. His broad research interests include the areas of spatial economics (such as regional economics, urban economics and international economics) and conflict resolution (such as graph model, arbitration and fair division). He won the 2nd Sakashita Prize in 2005 from the Applied Regional Science Conference of Japan, the 9th Spring-Verlag Award in 2004 from the Western Regional Science Association in US, and the 1999 paper award from the Institute of Electronics, Information and Communication Engineers in Japan.

On the Home Market Effect

Dao-Zhi Zeng

Graduate School of Information Sciences
Tohoku University

Abstract

This talk focuses on the home market effect (HME), theoretically defined in three ways. In terms of wage, the HME indicates that a larger country provides a higher wage of labor. The HME in terms of firm share means that a larger country accommodates a more-than-proportionate share of firms. Finally, the HME in terms of trade pattern says that a larger country is a net exporter to smaller one. Each of them is derived from a general-equilibrium model and they are shown equivalent recently. However, while the HME in terms of wage is observed in many empirical studies, there is no sufficient evidence supporting the HME in terms of firm share. This inconsistency is explained in two respects. First, when we use a CARA utility function rather than the CES, the HME in terms of wage remains but the HME in terms of firm share is not robust. Second, the definition in terms of firm share used in empirical studies is different from the theoretical definition.

PANEL DISCUSSION

Conflict Resolution and Risk Communication in the Complex World

Moderator:

Prof. Norio Okada, Kwansei Gakuin University

Panelist:

Prof. Kei Fukuyama, Tottori University

Prof. Takehiro Inohara, Tokyo Institute of Technology

Dr. Hiroyuki Sakakibara, Yamaguchi University

Dr. Yoko Matsuda, Kwansei Gakuin University

Conflict Resolution and Risk Communication in the Complex World

- Challenges towards Modeling, Characterization and Communication

Moderator: Norio Okada

The purpose of this panel session:

This new century seems to be challenged by increasing complexity in social and economic systems, coupled with growing risks of mega disasters due to climate change and activated crustal movement as well as seemingly intensified social and economic conflicts at local, regional, national and global level. That calls for upgraded efforts on the part of system-minded academics to contribute to conflict resolution, risk communication in the complex world. This panel discusses what needs to be further built upon methodologically, in terms of modeling, characterization and communication, based on each speaker's experience and thoughts.

Dr. Norio Okada

Professor, Institute for the Research of Disaster Area Reconstruction
Kwansei Gakuin University

Norio Okada is currently Director of Institute for the Research of Disaster Area Reconstruction, and Professor of Policy Studies, Kwansei Gakuin University, Kobe-Sanda Campus, Hyogo Pref., Japan. He is Professor Emeritus of Kyoto University and also adjunct professor of Kumamoto University, Japan. He was awarded the 2012 TD Walter Bean Visiting Professor in Environment from The University of Waterloo.

He is the President of the IDRiM (Integrated Disaster Risk Management) Society. His major research interests are twofold: methodological development and application, and field-based research for planning and management of physical and human systems, particularly related to natural disasters, the environment, water resources and infrastructure systems. His methodological foci include i) risk management and governance, ii) conflict management and game theoretic approaches, and iii) adaptive management of complex systems under high uncertainty.

Dr. Kei Fukuyama

Professor, Social Systems Engineering
Tottori University

Kei Fukuyama is a professor of Social Systems Engineering in Tottori University. His research interests are development and application of game theory and other microeconomics techniques from a social systems engineering perspective. The main application area is regional science and urban planning, especially development of a general methodology for assessing the viability and effectiveness of various approaches to enforcement of regional policies and regulations. He was graduated from Tottori University and then later received Ph.D. from University of Waterloo where he had met Professor Keith Hipel as his Ph.D. supervisor.

Focus of the presentation

Grasping intention and/or state of mind of residents correctly, and reflecting them to regional policies are mandatory for sustainable societies in depopulating small regions in Japan. Some research shows that there exists homeostasis in our mind that decision on satisfaction is adjusted according to the environment, and this ability of justification makes questionnaire/survey difficult to clarify their true (dis)satisfaction and other feeling on their lives, especially risk-related matters.

I would like to insist that, in Japan survey should be made based on 'peace of mind' or 'uneasiness feeling' oriented, not on direct question on '(dis)satisfaction'.

I present our initial attempt to clarify people's (dis)satisfaction on their daily life by small questionnaire survey on 'peace of mind' and 'uneasiness feeling'.

Dr.Takehiro Inohara

Professor, Department of Value and Decision Science (VALDES)
Tokyo Institute of Technology

Takehiro Inohara is a professor and the Chair of Department of Value and Decision Science (VALDES), Tokyo Institute of Technology (Tokyo Tech). He received his B.S. (Mathematics, 1992), M.S. (Systems Science, 1994) and Ph.D. (Systems Science, 1997), all from, Tokyo Tech. His research interests are in the fields of social systems modeling, mathematical decision making, systems evaluation, and consensus building. He is actively engaging in research on the framework of the Graph Model for Conflict Resolution incorporating realistic aspects of social systems such as coalition formation, decision makers' attitudes, preference changes, and states transition time. He is a reviewer of Mathematical Reviews, a member of Conflict Analysis Group in the University of Waterloo, and the leader of the International Program on Consensus Building (IPCOB) at Tokyo Tech. In 2003, he received "Tokyo Tech Award for Challenging Research" from Tokyo Tech, and in 2005, "The Young Scientist's Prize" from the Ministry of Education, Culture, Sports, Science and Technology (MEXT).

Focus of the presentation

i) Challenges towards modeling coalition formation and decision makers' attitudes within the framework of the Graph Model for Conflict Resolution (GMCR)
ii) Challenges towards modeling states transition time within the framework of GMCR
iii) Challenges towards modeling decision makers' preference changes within the framework of GMCR

Dr. Hiroyuki Sakakibara

Associate Professor
Department of Civil and Environmental Engineering
Yamaguchi University

Hiroyuki Sakakibara is an associate professor at department of civil and environmental engineering, faculty of engineering, Yamaguchi University, Japan. Dr. Sakakibara received a doctor degree from Kyoto University in 2001, a master degree from Kyoto University in 1997, and bachelor degree from Kyoto University in 1995.
His research interests are, participatory planning process, conflict management, planning in small-scale communities and disaster risk management. Dr. Sakakibara was an exchange student from Kyoto University to University of Waterloo, when he was a master student.

Focus of the presentation

Sense making process in participatory planning is discussed.
In order to give a meaning to the plan, citizens' knowledge and experts' knowledge should be combined.
Discussion in participatory planning can contribute to such sense making process.

Dr. Yoko Matsuda

Researcher and Associate Professor
Institute for the Research of Disaster Area Reconstruction
Kwansei Gakuin University

Yoko Matsuda is a researcher and associate professor in the Institute for the Research of Disaster Area Reconstruction, Kwansei Gakuin University. Her research interests include disaster recovery and preparedness process by local and citizen groups. Previously she was a staff member of Rescue Stock Yard, a Nagoya-based non-profit organization for disaster relief and preparedness. After the Great East Japan Earthquake in 2011, she served as a manager to send 1,500 foot bath volunteers to Tohoku. She received her Dr. Eng. in 2007 from Kyoto University.

Focus of the presentation

Examples of Workshops and social surveys after Tohoku Earthquake and Tsunami.
How can we design "dialogues among participants" in a high context society such as Japan?