

Plenary Panel Session 1: Robotics: The Present and The Future

Time: 1:30-3:30pm, Thursday, 18 December 2008

Venue: Ballroom 3

Chair: Professor Danwei Wang, Nanyang Technological University, Singapore

Co-Chair: Prof. Shinichi Hirai, Ritsumeikan University, Japan

Panelists: Professor Robert D. Howe, Harvard University, USA
Professor Katsushi Ikeuchi, University of Tokyo, Japan
Dr. Christian Laugier, INRIA, France
Dr. Michel Parent, INRIA, France



Professor Robert D. Howe is Gordon McKay Professor of Engineering in the Harvard School of Engineering and Applied Sciences. Dr. Howe earned a bachelors degree in physics from Reed College, then worked as a design engineer in the electronics industry in Silicon Valley. He received a doctoral degree in mechanical engineering from Stanford University in 1990, and then joined the faculty at Harvard. Dr. Howe founded the Harvard BioRobotics Laboratory, which investigates the roles of sensing and mechanical design in motor control, in both humans and robots. His research interests focus on manipulation, the sense of touch, and human-machine interfaces. Biomedical applications of this work include the development of robotic and image-guided approaches to minimally invasive surgical procedures.



Dr. Katsushi Ikeuchi is a Professor at the University of Tokyo. He received a Ph.D. degree in Information Engineering from the University of Tokyo in 1978. After working at MIT's AI Lab for two years, ETL, Japan for five years, and CMU for ten years, he joined the university in 1996. His research interest spans computer vision, robotics, and computer graphics. He has received several awards, including ICCV David Marr award and IEEE R&A K-S Fu Memorial Best Transaction Paper award. He has been elected as a fellow of IEEE since 1998. He is a distinguished lecturer of IEEE RAS this year.



Dr. Christian Laugier is Research Director at INRIA and Scientific Leader of the e-Motion project-team (<http://emotion.inrialpes.fr>). He is also Deputy Director of the LIG Laboratory. He received the Ph.D and "State Doctor" degrees in Computer Science from Grenoble University (France) in 1976, and 1987 respectively. His current research interests mainly lies in the areas of Motion Autonomy, Intelligent Vehicles, and Probabilistic Robotics. Dr. Christian Laugier is a member of several scientific national and international committees including the Adcom of IROS conference and the IEEE TC on ITS & Autonomous Vehicles. He has been General Chair or

Program Chair of several international conferences such as IEEE/RSJ IROS'97, IROS'02, IROS'08, or FSR'07. He has co-edited several books, e.g. recent Springer STAR books on “Autonomous navigation in Dynamics Environments” and on “Probabilistic Reasoning and Decision Making in Sensory-Motors Systems”; he has also co-edited several special issues of scientific journals (IJRR, Advanced Robotics, JFR, IEEE Transactions on ITS, RIA, IJVAS). In addition to his research and teaching activities, he participated in the start-up of four industrial companies in the fields of Robotics, Computer Vision, Computer Graphics, and Bayesian Programming.



Dr. Michel Parent is currently the program manager at INRIA of the R&D team on advanced road transport (IMARA research group). This group focuses on research and development of new forms of road transport and in particular on fully automated vehicles (the cybercars). Michel Parent has been or is the coordinator of several European projects on this topic.

Before his current position which he holds since 1991, Michel Parent has spent half of his time in research and academia at such places as Stanford University and MIT in the USA and INRIA in France, and the other half in the robotics industry. He is the author of several books on robotics, vision and intelligent vehicles, and numerous publications and patents. He was the coordinator of the European Project CyberCars between 2001 and 2004 and this project is continued now in CyberCars2 (2006-2009).

Michel Parent has an engineering degree from the French Aeronautics School (ENSAE), a Masters degree in Operation Research and a Ph.D. in Computer Science, both from Case Western Reserve University, USA.

Plenary Panel Session 2: Control of Complex Systems

Time: 4:00-6:00pm, Thursday, 18 December 2008
Venue: Ballroom 3
Chair: Professor Lihua Xie, Nanyang Technological University, Singapore
Co-Chair: Professor Gary Feng, City University of Hong Kong

Panelists: Professor Stephen P. Boyd, Stanford University, USA
Professor Minyue Fu, The University of Newcastle, Australia
Professor Bijoy K. Ghosh, Texas Tech University, USA
Professor Masao Ikeda, Osaka University, Japan
Professor Richard M. Murray, California Institute of Technology, USA



Professor Stephen P. Boyd is the Samsung Professor of Engineering, and Professor of Electrical Engineering in the Information Systems Laboratory at Stanford University. His current research focus is on convex optimization applications in control, signal processing, and circuit design.

Professor Boyd received an AB degree in Mathematics, summa cum laude, from Harvard University in 1980, and a PhD in EECS from U. C. Berkeley in 1985. In 1985 he joined the faculty of Stanford's Electrical Engineering Department. He has held visiting Professor positions at Katholieke University (Leuven), McGill University (Montreal), Ecole Polytechnique Federale (Lausanne), Qinghua University (Beijing), Universite Paul Sabatier (Toulouse), Royal Institute of Technology (Stockholm), Kyoto University, and Harbin Institute of Technology. He holds an honorary doctorate from Royal Institute of Technology (KTH), Stockholm.

Professor Boyd is the author of many research articles and three books: *Linear Controller Design: Limits of Performance* (with Craig Barratt, 1991), *Linear Matrix Inequalities in System and Control Theory* (with L. El Ghaoui, E. Feron, and V. Balakrishnan, 1994), and *Convex Optimization* (with Lieven Vandenberghe, 2004).

Professor Boyd has received many awards and honors for his research in control systems engineering and optimization, including an ONR Young Investigator Award, a Presidential Young Investigator Award, and an IBM faculty development award. In 1992 he received the AACC Donald P. Eckman Award, which is given annually for the greatest contribution to the field of control engineering by someone under the age of 35. In 1993 he was elected Distinguished Lecturer of the IEEE Control Systems Society, and in 1999, he was elected Fellow of the IEEE, with citation: "For contributions to the design and analysis of control systems using convex optimization based CAD tools." He has been invited to deliver more than 30 plenary and keynote lectures at major conferences in both control and optimization.



Professor Minyue Fu received his Bachelor's Degree in Electrical Engineering from the University of Science and Technology of China, Hefei, China, in 1982, and M.S. and Ph.D. degrees in Electrical Engineering from the University of Wisconsin-Madison in 1983 and 1987, respectively.

From 1983 to 1987, he held a teaching assistantship and a research assistantship at the University of Wisconsin-Madison. He worked as a Computer Engineering Consultant at Nicolet Instruments, Inc., Madison, Wisconsin, during 1987. From 1987 to 1989, he served as an Assistant Professor in the Department of Electrical and Computer Engineering, Wayne State University, Detroit, Michigan. For the summer of 1989, he was employed by the Universite Catholique de Louvain, Belgium, as a Maitre de Conferences Invited. He joined the Department of Electrical and Computer Engineering, the University of Newcastle, Australia, in 1989. Currently, he is a Chair Professor in Electrical Engineering and Head of School of Electrical Engineering and Computer Science. In addition, he was a Visiting Associate Professor at University of Iowa in 1995-1996, and a Senior Fellow/Visiting Professor at Nanyang Technological University, Singapore, 2002.

Professor Fu is an IEEE Fellow. His main research interests include control systems, signal processing and communications. He has been an Associate Editor for the IEEE Transactions on Automatic Control, Automatica and Journal of Optimization and Engineering.



Professor Bijoy K. Ghosh received the B. Tech and M.Tech degrees in Electrical and Electronics Engineering from BITS, Pilani, the Indian Institute of Technology, Kanpur, India and the PhD degree in Engineering from the Decision and Control Group of the Division of Applied Sciences, Harvard University, Cambridge, MA in 1977, 1979 and 1983, respectively. From 1983 to 2006, he was with the Department of Electrical and Systems Engineering, Washington University, St. Louis, MO, where he was a Professor and Director of the Center for BioCybernetics and Intelligent Systems. Currently he is the Brooks Regents Professor of Mathematics and Statistics at Texas Tech University, Lubbock. His research interests are in multivariable control theory, machine vision, robotic manufacturing and biosystems and control. Bijoy is a 1988 recipient of the Donald P. Eckmann award from the American Automatic Control Council and is a Fellow of the IEEE. He also received the JSPS invitation fellowship in the year 1997.



Masao Ikeda is a Professor of Mechanical Engineering at Osaka University, Japan. He received his B.Eng., M.Eng., and D.Eng. degrees all in communication engineering from Osaka University in 1969, 1971, and 1975, respectively. In 1973 he joined the Systems Engineering Department of Kobe University, Japan, where he became a Professor in 1990. In 1995, he returned to Osaka University, and has been a member of the Council of Osaka University for two years from 2002, and currently an Associate Dean of the Graduate School of Engineering and the Director of Frontier Research Center. He has held visiting appointments at Santa Clara University, USA, Arizona State University, USA, and the National Aerospace Laboratory of Japan.

His research interests include theory for large scale systems, nonlinear feedback systems, time-varying systems, time-delay systems, two-degrees-of-freedom control systems, and descriptor systems. He is also interested in control applications such as vibration isolation systems, large space structures, dynamic measurement of moving vehicles, structural design for vibration suppression, and powered suits using pneumatic actuators.

Prof. Ikeda has served as an Associate Editor for Systems and Control Letters, and Automatica. He was the President of SICE (Society of Instrument and Control Engineers) in 2005. He is currently the Editor-in-Chief of the SICE Journal of Control, Measurement, and System Integration, which the society launched in 2008. He has received several awards from SICE, ISCIE (Institute of Systems, Control, and Information Engineers), and JSME (Japan Society of Mechanical Engineers). He is a Fellow of SICE, IEEE, and JSME.



Richard M. Murray received the B.S. degree in Electrical Engineering from California Institute of Technology in 1985 and the M.S. and Ph.D. degrees in Electrical Engineering and Computer Sciences from the University of California, Berkeley, in 1988 and 1991, respectively. He is currently the Thomas E. and Doris Everhart Professor of Control and Dynamical Systems and the Director for Information Science and Technology at the California Institute of Technology, Pasadena. Murray's research is in the application of feedback and control to mechanical, information, and biological systems.

Current projects include integration of control, communications, and computer science in multi-agent systems, information dynamics in networked feedback systems, analysis of insect flight control systems, and synthetic biology using genetically-encoded finite state machines.