Presentation Highlights

Prof. Gordon Cheng
Director of Institute for Cognitive Systems
Faculty of Electrical and Computer Engineering
Technical University of Munich

Prof. Gordon Cheng holds the Chair of Cognitive Systems. He is Founder and Director of Institute for Cognitive Systems, Faculty of Electrical and Computer Engineering at Technical University of Munich, Munich/Germany. He is also the coordinator of the CoC for Neuro-Engineering - Center of Competence Neuro-Engineering in the Department of Electrical and Computer Engineering.
Formerly, he was the Head of the Department of Humanoid Robotics and Computational Neuroscience, ATR Computational Neuroscience Laboratories, Kyoto, Japan. He was the Group Leader for the newly initiated JST International Cooperative Research Project (ICORP), Computational Brain. He has also been designated as a Project Leader/Research Expert for National Institute of Information and Communications Technology (NICT) of Japan. He is also actively involved in a number of major European Union Projects.
Gordon Cheng has been the co-inventor of approximately 20 patents and is the author of approximately 250 technical publications, proceedings, editorials and book chapters. He is Fellow of the IEEE, recognised for his "Contributions in Humanoid Robotic Systems and Neurorobotics".

Robotics@TUM

With the advancement of robots that are able to sense the environment, reason about it, and take action to perform tasks in cooperation with humans requires a new quality of integrative research collaboration of best in-class experts embracing top-level engineering and natural science disciplines. Munich, considered as one of the seven top locations in the world for robotics, comprises top players highly recognized in the field like the Deutsches Zentrum für Luft- und Raumfahrt (DLR) and the Technical University of Munich, in particular, with its departments of electrical and computer engineering, mechanical engineering and informatics. This presentation will highlight some of the key robotic research activities at TUM. The core robotic research at the university comprises the following areas: healthcare robotics, advanced manufacturing production and intelligent and autonomous systems.

Prof. I-Ming Chen
Director
Robotics Research Centre
School of Mechanical and Aerospace Engineering
Nanyang Technological University

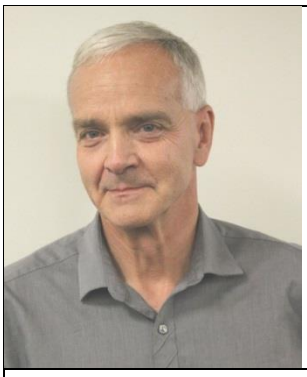
Professor I-Ming Chen is an internationally renowned robotics researcher. He received the B.S. degree from National Taiwan University in 1986, and M.S. and Ph.D. degrees from California Institute of Technology, Pasadena, CA in 1989 and 1994 respectively. He has been with the School of Mechanical and Aerospace Engineering of Nanyang Technological University (NTU) in Singapore since 1995. He is currently Director of Robotics Research Centre and also Director of Intelligent Systems Center in NTU. Professor Chen also acts as the Deputy Program Manager of A*STAR SERC Industrial Robotics Program to coordinate project and activities under this multi-institutional program involving NTU, NUS, SIMTech, A*STAR I2R and SUTD. He is a member of the Robotics Task Force 2014 under the National Research Foundation which is responsible for Singapore's strategic R&D plan in future robotics. His research interests are in wearable devices, human-robot interaction and industrial automation. Professor Chen is Fellow of IEEE and Fellow of ASME, General Chairman of 2017 IEEE International Conference on Robotics and Automation (ICRA 2017) in Singapore.

Innovations in Infrastructure Service Robotics and Robotics Research in NTU

Infrastructure robotics is a discipline studying robotic systems and methodology for buildings and civil infrastructure construction, inspection, and maintenance. The target could be buildings, estates, parks, bridges, power plants, power transmission lines, underground tunnels, sewage pipes, port facilities, etc. Developing robotic technology for infrastructures has the following significance:

1) Economics and sustainability – Robotic technology would be able to reduce the reliance on unskilled workers and also skilled workers operating on sophisticate construction machinery and thus transform population-reliant GDP growth to productivity-reliant GDP growth.
2) Productivity – Robotic technology will streamline and further optimize current construction process for shorter project period, and also assure quality consistency of the construction project.
3) Safety and health – Robotic technology will reduce the human exposure to hazardous and inaccessible areas and environment during construction so as to change the public mind set of the construction industry as an attractive career goal.

In this talk, several new and on-going infrastructure robotics projects, ranging from construction robots, tunnel inspection robots and logistics robots carried out in Singapore will be introduced. With new actuators, low cost sensors, and open source robotics software, infrastructure robots represent a new breed of intelligent systems that help the society to overcome manpower shortage and ageing workforce issues. These projects are examples of user-led and user-inspired robotics R&D effort led by government agencies, universities, research institutions, and industrial alliance of local and overseas robotics and construction machinery manufacturers, start-up companies, and system integrators. The ultimate goal is to strengthen the robotics R&D capability in Singapore and to foster a robotics industry and the ecosystem that transform Singapore into a Smart Nation.



Prof. Martial Hebert
Director
Robotics Institute
Carnegie Mellon University

Martial Hebert is a Professor of Robotics Carnegie Mellon University and Director of the Robotics Institute, which he joined in 1984. His interest includes computer vision, in particular recognition in images and video data, model building and object recognition from 3D data, and perception for mobile robots and for intelligent vehicles. His group has developed approaches for object recognition and scene analysis in images, 3D point clouds, and video sequences. In the area of machine perception for robotics, his group has developed techniques for people detection, tracking, and prediction, and for understanding the environment of ground vehicles from sensor data. He has served on the editorial boards the IEEE Transactions on Robotics and Automation, the IEEE transactions on Pattern Analysis and Machine Intelligence, and the International Journal of Computer Vision (for which he currently serves as Editor-in-Chief).

Current work at the Robotics Institute

The Robotics Institute (RI) at Carnegie Mellon University is dedicated to research in all the components of robotics systems, in acting, sensing, and reasoning, and their application to a wide range of applications. The RI includes a full complement of educational program at all levels, Ph.D., three Masters programs (research, systems development, computer vision) and an undergraduate second major.

This presentation will highlight recent developments at the RI. In the basic research aspects, they include for example, collaborative and modular robotics for manufacturing; learning techniques for robotics from end-to-end learning to imitation learning; exciting new development in robust sensing for field robotics, manufacturing, and medical scenarios. In the applicative aspects, recent developments include the launch this year of a sister Manufacturing Institute; large-scale initiatives in agriculture, infrastructure, and logistics robotics.