INFO ABOUT SPEAKERS AND LECTURES

Plenary Lecture 1

Prof. John S. Baras

Lockheed Martin Chair in Systems Engineering

University of Maryland College Park

Biography

B.S. in Electrical Eng. from the Nat. Techn. Univ. of Athens, Greece, 1970; M.S. and Ph.D. in Applied Math. from Harvard Univ. 1971, 1973. Since 1973 with the Electrical and Computer Engineering Department, and the Applied Mathematics Faculty, at the University of Maryland College Park. Since 2000 faculty member in the Fischell Department of Bioengineering. Founding Director of the Institute for Systems Research (ISR) from 1985 to 1991. Since 1991, has been the Director of the Maryland Center for Hybrid Networks (HYNET). Fellow of the IEEE and a Foreign Member of the Royal Swedish Academy of Engineering Sciences. Received the 1980 George Axelby Prize from the IEEE Control Systems Society and the 2006 Leonard Abraham Prize from the IEEE Communications Society. Professor Baras' research interests include control, communication and computing systems.

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Component-based Architectures for the Synthesis of Intelligent Networked Systems

Abstract

Advances in Information Technology have enabled the design of complex networked systems, with large number of heterogeneous components and capable of multiple complex functions. These advances have at the same time increased the capabilities of such systems and have increased their complexity to such an extent that systematic design towards predictable performance is extremely difficult if not unfeasible today. This is especially manifested in the area of cyber-physical systems, of all scales, that have become ubiquitous. In addition, the need for systems that can rapidly adapt to new situations and change their

structure and behavior accordingly has also increased dramatically. We present methodologies that show promise in addressing these challenges. They include model-based systems engineering, component based synthesis and architectural design towards efficiency and adaptability. We demonstrate their effectiveness in various applications: collaborative robotics, collaborative heterogeneous sensor networks, cyber security of critical infrastructures, human-machine teams and organizations, and composite trust.

Plenary Lecture 2

Prof. Shigeki SUGANO

Modern Mechanical Engineering

School of Creative Science and Engineering

Waseda University

URL: http://www.sugano.mech.waseda.ac.jp (Laboratory)

Biography

Shigeki Sugano received the B.S., M.S., and Dr. of Engineering in Mechanical Engineering in 1981, 1983, and 1989, respectively, from Waseda University. From 1986 to 1990, he was a Research Associate in Waseda University. Since 1990, he has been a Faculty Member in the Department of Mechanical Engineering, Waseda University, where he is currently a Professor. From 1993 to 1994, he was a Visiting Scholar in the Mechanical Engineering Department, Stanford University. Since 2001, he has been a Director of the Waseda WABOT-HOUSE laboratory.

His research interests include human-symbiotic anthropomorphic robot design, dexterous and safety manipulator, and human-robot communication. He received the Technical Innovation Award from the Robotics Society Japan for the development of Waseda Piano-Playing Robot: WABOT-2 in 1991. He received the JSME Medal for Outstanding Paper from the Japan Society of Mechanical Engineers in 2000. He received JSME Fellow Award in 2006. He received IEEE Fellow Award in 2007. He received RSJ Fellow Award in 2008.

He served as the Secretary of the IEEE Robotics & Automation Society (RAS) in 2006 and 2007. He served as a Co-Chair of the IEEE RAS Technical Committee on Humanoid Robotics from 2005 to 2008. He served as the IEEE RAS Conference Board, Meetings Chair from 1997 to 2005. He has served as an AdCom member of the IEEE RAS and the Associate Vice-President of the IEEE RAS Conference Board since 2008.

He has served as the Editor in Chief of the International Journal of Advanced Robotics since 2007. He served as the Head of the System Integration Division of the Society of Instrument and Control Engineers (SICE) in 2006 and 2007. He served as a Director of SICE in 2008 and 2009. He served as the President of Japan Association for Automation Advancement from 2001 to 2009.

He served as the General Chair of the 2003 IEEE/ASME International Conference on Advanced Intelligent Mechatronics (AIM2003). He served as a General Co-Chairs of the 2006 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS2006). He served as a Program Co-Chairs of the 2009 IEEE International Conference on Robotics and Automation (ICRA2009) and will serve as the General Co-Chair of the 2012 IEEE International Conference on Robotics and Automation (ICRA2012). He will serve as the General Chair of the 2011 SICE Annual Conference (SICE2011) in Tokyo. He will serve as the General Chair of the 2013 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS2013) in Tokyo.

Cyber Systems Coordination: Structured Environment and Intelligent Robot

Abstract

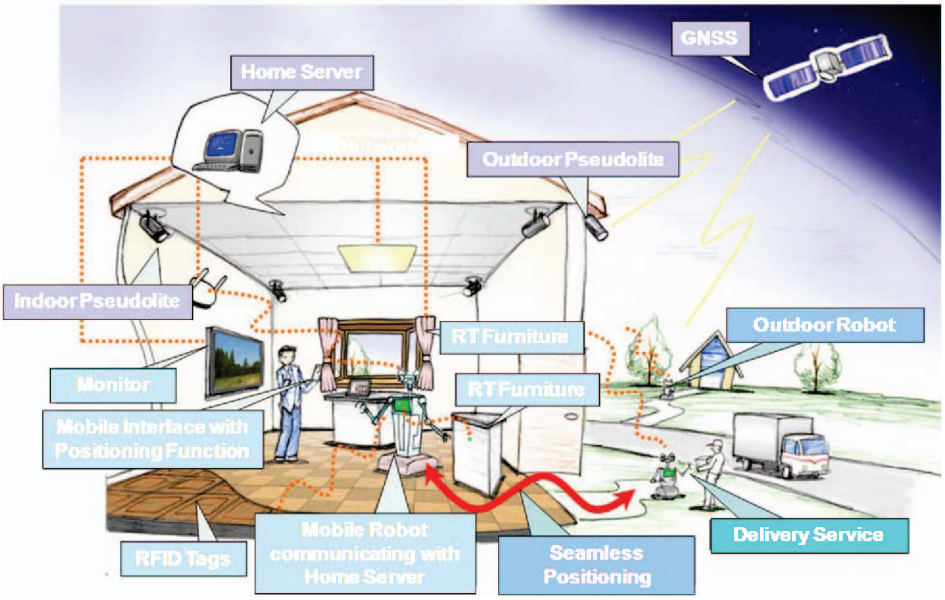
The development of Intelligent Humanoid Robots which can support human labor and assist human daily activities by several combined communication channels, such as physical interaction and informational interaction, is expected to play an important role in aging societies. Such robots are distinctively called "Human Symbiotic Robots". In addition, if we envisage the harmonious symbiosis of human and robots in the future, we must establish the system by integrating robot technology and environments, i.e. the dexterity of the robots and the structures, and functions of the houses and facilities. We also have to take the view of our future life style into account the design of the house and robots.

From the above point of view, we have studied Humanoid Robots and Robot-Environment in the Humanoid Robot Project and the WABOT-HOUSE Project in Waseda University. In the Humanoid Robot Project, we developed TWENDY-ONE in 2007. TWENDY-ONE is a typical anthropomorphic robot which equips passive safety mechanisms, high-power actuators, dexterous hands with special featured sensors, human-friendly communication functions and omni-directional mobility. The WABOT-HOUSE was established in 2006 for the purpose of investigating the design method of the structured environment for Human-Robot symbiosis by coordinating Robotics, Architecture and Information Technology. It includes original new functions such as movable kitchen, changeable arrangement of the rooms, transparency wall, and positioning systems, RFID Tags and Indoor GPS.

In this presentation, I will introduce the concept and the design of a future Cyber System coordinating robots and the structured environment in human daily life, showing examples of our human-symbiotic-robot “TWENDY-ONE” and our robotic house “WABOT-HOUSE”.

Structured Environment

WABOT-HOUSE



Human-Symbiotic Robot

TWENDY-ONE