

Invited talker:



**Associate Professor
Michita Imai**

IT1 : Human-Robot Interaction and Social Relation

Michita Imai
(Keio University, Japan)

This talk presents the factor of designing an anthropomorphic agent such as a communication robot and an embodied communicative agent. Communication is a cooperative phenomenon between participants. People involved in a communication speak and hear actively during the conversation. However, it is difficult to engage them in the communication with a robot because they seldom actively consider the communicative intention of the robot. This talk explains the importance of social relationship between a human and a robot for engaging people in the communication. In particular, we consider how the relation makes them consider the intention of the robot. Also, I show what factors of the robot design elicit the social relation.

Education:

- In 1994, M.S. degree in Computer Science from Department of Computer Science, Keio University, Japan
- In 2002, Ph.D.(Eng.) in Computer Science from Department of Computer Science, Keio University, Japan

Professional Training and Employment:

- 1994-1997, Researcher, Human-Interface Laboratories, Nippon Telephone Telegram (NTT), Japan
- 1997-2002, Researcher, ATR Media Integration and Communications Research Laboratories, Japan
- 2002-2003, Assistant Professor, Department of Information and Computer Science, Keio University, Japan
- 2002-2006, Researcher, JST Prest "Interaction and Intelligence"
- 2003-2005, Lecturer, Department of Information and Computer Science, Keio University, Japan
- 2005-present, Associate Professor, Department of Information and Computer Science, Keio University, Japan



Prof. Tatsuo Arai

IT2 : Micro Nano Robotics

Tatsuo Arai
(Osaka University, Japan)

Manipulation, sensing, actuation, and automation in micro nano scale have various applications and contributions in biotechnology, pharmacy, medicine as well as in industries. Micro hands are developed to manipulate micro and nano order size objects dexterously. Micro channels fabricated on a chip, called micro TAS or lab on chip, can provide various operations and processes for cells and tissues. Those activities include elaborating machining, assembly, fabrication and integration with MEMS technique as well as robotics and mechatronics. The talk will cover mainly two topics, micro manipulation system with dexterous hand and desktop bio plant, along with their back ground and the state of the art in Japan.

Tatsuo ARAI was born in 1952 in Tokyo. He received B.S. M.S. and PhD degrees from the University of Tokyo in 1975, 1977, and 1986 respectively. He joined the Mechanical Engineering Laboratory, AIST, MITI (now METI) in 1977, and was engaged in research and development of new arm design and control, mobile robot, teleoperation, and micro robotics. He stayed at MIT as a visiting scientist in 1986-1987. He was an adjunct lecturer at Chiba University in 1986-1996, and a visiting professor at the Science University of Tokyo in 1996-1997. He moved to Osaka University in 1997 and since then he has been a Full Professor at the Department of Systems Innovation, Graduate School of Engineering Science. His current research topics are mechanism design including parallel mechanisms, legged working robot, micro robotics for bio applications, humanoid robot, haptic interface, and network robotics. He has published more than 300 journal and conference papers on robotics and automation, 6 books, and has 37 patents including foreign 8. The publication list is on http://www-arailab.sys.es.osaka-u.ac.jp/publication/e_index.html

He is a member of IEEE, International Association of Automation and Robotics in Construction (IAARC), Robotic Society of Japan (RSJ), Society of Instrumentation and Control Engineers, Japan Society of Mechanical Engineers (JSME), and other societies. He is currently an Editor-in-Chief of Journal of Robotics and Mechatronics. He served as a Vice President of IAARC, a chair of Robotics and Mechatronics Division of JSME, a Director of RSJ, a chair of the Technical Advisory Committee of the Destruction of Abandoned Chemical Weapon of the Cabinet Office. He has been organizing and chairing many research committees, conferences, and symposia for IEEE, IAARC, RSJ, SICE, and JSME.



**Associate Professor
Mamiko Sakata**

IT3 : Quantifying Dance Movement *Waza* in *Nihon-Buyo*

Mamiko Sakata
(Doshisha University, Japan)

Dance is an intangible cultural asset. It is passed on from one person to another through oral instruction, and so are the *waza*, the skills and techniques. involved in dance. Many traditional dances in Japan, however, are 'endangered species' due to the shortage of practitioners. We are attempting to create digital archives to record and store the body motions of *buyo* using digital technologies, such as motion capture. We are endeavoring to solve this serious issue of losing an important tradition. In my talk, I would like to present part of our scientific analysis of the *waza* in *Nihon-buyo*, which have been passed down, sometimes in silent, tacit manners.

Education:

- 1999: M.S. degree in Cultural Studies and Human Sciences from Kobe University, Kobe, Japan
- 2002: Ph.D. in Cultural Studies and Human Sciences from Kobe University, Kobe, Japan

Professional Training and Employment:

- 1999-2001: Researcher, ATR Media Integration & Communications Research Laboratories, Japan
- 2002-2005: Lecturer, Department of Nursery ,Fukushima College, Japan
- 2005-2008: Lecturer, Faculty of Culture and Information Science, Doshisha University, Japan
- 2008-present: Associate Professor, Faculty of Culture and Information Science, Doshisha University, Japan



**Professor
Henrik Hautop Lund**

IT4 Social playware for mediating tele-play interaction over distance

Henrik Hautop Lund and Tumi Thorsteinsson
(Technical University of Denmark, Denmark)

We suggest that novel playware technology can function as a mediator for playful social interaction over distance, where people are separated by physical distance but feel the presence of each other mediated through the interaction with the playware technology. In order to investigate such social playware, we developed the Playware Soccer game and tested this with more than 1,000 users during the FIFA World Cup 2010 in South Africa. The test was conducted in townships, orphanages for HIV/AIDS children, markets, FIFA fan parks, etc. along with simultaneous tests with similar set-ups in Europe and Asia. With the social playware, players would compete against each other simultaneously in the three continents, Africa, Europe and Asia, and feel the presence of the competitors on the other continents expressed through the playware. The playware game is set up to motivate players to engage in training of technical soccer skills by receiving immediate feedback and offering challenges to players of all skills on the soccer playing on a modular interactive wall composed of modular interactive tiles that respond with coloured light, sound and scores on the players performance. This paper outlines the concept of social playware and physical-virtual teleplay, and exemplifies this with the playware soccer game.

Education:

- M.Sc. degree in Computer Science from University of Aarhus, Denmark
- Ph.D. degree in Computer Systems Engineering from University of Southern Denmark

Professional Training and Employment:

- 1992-1993 and 1994-1995, Research Assistant, the National Research Council, Rome
- 1996-1997, Research Associate (Post Doctor), Department of Artificial Intelligence, Edinburgh, UK
- 1997-2000, Head of LEGO Lab
- 1998-2000, Research Associate, Department of Computer Science, University of Aarhus, Denmark
- 2000-2008, Full Professor, the Maersk Mc-Kinney Moeller Institute, University of Southern Denmark
- 2003-2007, Member of the Danish Research Council
- 2008-present, Full Professor, the Center for Playware, Technical University of Denmark



**Professor
Luigi Pagliarini**

IT5 An Educational Tool for Interactive Parallel and Distributed Processing

Luigi Pagliarini^{1,2} and Henrik Hautop Lund¹
(¹Technical University of Denmark, Denmark)
(²Academy of Fine Arts of Bari, Via Gobetti, Italy)

In this paper we try to describe how the Modular Interactive Tiles System (MITS) can be a valuable tool for introducing students to interactive parallel and distributed processing programming, by forcing and challenging programmers in designing interactive parallel and distributed systems. Indeed, MITS seems to bring a series of goals into the education, such as parallel programming, distributedness, communication protocols, master dependency, software behavioral models, adaptive interactivity, feedback, connectivity, topology, island modeling, user and multi-user interaction, which can hardly be found in other tools. We introduce the system of modular interactive tiles as a tool for easy, fast, and flexible hands-on exploration of these issues, and through examples show how to implement interactive parallel and distributed processing with different software behavioural models such as open loop, randomness based, rule based, user interaction based, AI and ALife based software.

Education:

- Master Degree in Experimental Neuropsychology

Professional Training and Employment:

An Artist, Art Curator, Psychologist, Multimedia and Software Designer, and a worldwide known as a theoretician and expert in (mainly Artistic) Robotics, A.I. and Artificial Life.

- Professor, Theories of Perception and Psychology of Shape and of Computer Art, the Academy of Fine Arts of Bari, Italy
- Associate Professor, Center for Playware, Technical University of Denmark
- Founder and Director, the Pescara Electronic Artists Meeting
- President, the Cultural Association Artificialia
- Art Director, Ecoteca
- Founder of RoboCup Junior and Member of its International Committee