## Invited Talker
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.
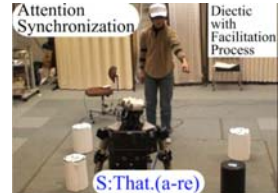
IT2 Micro Nano Robotics

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.
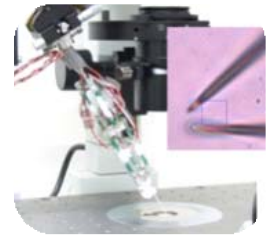
IT3 Quantifying "*Waza*" in *Nihon-Buyo* Dance Movements

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 this paper, 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.

IT4 Social playware for mediating tele-play interaction over distance

Henrik Hautop Lund, 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 physicalvirtual teleplay, and exemplifies this with the playware soccer game.

IT5 An educational tool for interactive parallel and distributed processing

Luigi Pagliarini[1,2], Henrik Hautop Lund[1]
([1]Technical University of Denmark, Denmark)
([2]Academy of Fine Arts of Bari, 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. This is done by providing an educational hands-on tool that allows a change of representation of the abstract problems related to 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 multiuser interaction, which can hardly be found in other tools. Finally, 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.