

## Avviso di Seminario

Nell'ambito delle Attività della Scuola Dottorale di Ingegneria, sezione Ingegneria Informatica e Automatica, alle **ore 15 di giovedì 8 ottobre**, presso la **Sala Riunioni del Dipartimento di Informatica e Automazione** in Via della Vasca Navale 79, si terrà il seguente seminario:

### **Learning-from-Observation: from assembly plan through dancing humanoid**

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#### **Abstract**

We have been developing the paradigm referred to as “programming-by-demonstration.” The method involves simple observation of what a human is doing and generation of robot programs to mimic the same operations. The first half of this talk presents the history of what we have done so far under this paradigm. Here, we emphasize the top-down approach to utilize pre-defined, mathematically derived, task-and-skill models for observing and mimicking human operations. We will show several examples of task-and-skill models applicable in different domains. Then, the second half focuses on our newest effort to make a humanoid robot dance Japanese folk dances using the same paradigm. Human dance motions are recorded using optical or magnetic motion-capture systems. These captured motions are segmented into tasks using motion analysis, music information, and task-and-skill models. We can characterize personal differences of dance using task-and-skill models. Then, we can map these motion models onto robot motions by considering dynamic and structural differences between human and robot bodies. As a demonstration of our system, I will show a video in which a humanoid robot performs a Japanese folk dance.

#### ***Brief Biographical Sketch:***

*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 the Massachusetts Institute of Technology's AI Lab for two years, Electrotechnical Lab, Japan for five years, and Carnegie Mellon University 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 the IEEE R&A K-S Fu Memorial Best Transaction Paper award for the paper “Toward Automatic Robot Instruction from Perception.” He has served as the program/general chairman of several international conferences, including 1995 IEEE-IROS, 1996 IEEE-CVPR, 1999 IEEE-ITSC, 2003 IEEE-ICCV. He is Editor-in-Chief of the International Journal of Computer Vision. He is a distinguished speaker of the IEEE RAS society this year. He has been elected as a fellow of IEEE since 1998.*