Robotics Seminar

Date **9/7 (Monday), 2009 13:30-14:30**
Place **Seminar Room of Mechanical Systems, East Wing 4F**
Biwako-Kusatsu Campus, Ritsumeikan University

Handling and Manipulating Very Flexible Sheets by Robots

Professor Nikos A. Aspragathos

Robotics Group
Mechanical Eng. and Aeronautics Department
University of Patras, Patras, Greece

In this seminar the research work on robotic handling and manipulating very flexible sheets like fabrics performed by the Robotics Group, University of Patras will be presented. The scope of this work is to enhance the robot capabilities towards handling and manipulating a high variety of fabrics in complicated manufacturing tasks. The introduced approach is based on the systematic investigation of human handling and manipulation and the acquired knowledge is used for developing motion planners and controllers based on Artificial Intelligence and on multiple sensor feedback. The handling and manipulating tasks investigated are related to the robotic sewing automation and so the sheets are mainly considered in relation to the sewing table. The main tasks considered in this work are:

- Separating and picking a fabric sheet from a stack.
- Placing a fabric sheet at an exact location on a table.
- Folding a sheet on a table, while wrinkles are avoided.
- Manipulating a fabric sheet on a table with visual servoing.
- Control the cloth tension in sewing.

Details on the experiments for the knowledge acquisition considering the fabric behavior in handling and manipulation will be presented. The introduced methods for the motion planners and controllers design will be highlighted. Results from the tests and demonstration videos will be shown. The speech will conclude with some hints considering future research work.

BIOGRAPHY

Professor Nikos A. Aspragathos leads the Robotics Group Mechanical and Aeronautics Engineering Department, University of Patras.

Electrical Engineering degree (1975) and PhD (1981) from the School of Engineering, University of Patras, Greece. He joined Greek industrial companies as a construction and maintenance Engineer (1976-1980). In 1982 he was appointed Lecturer in Mechanical and Aeronautics Engineering Department, University of Patras. He was a visiting member of the staff in UWIST, Cardiff from 1987 to 1988.

His main research interests are robotics, intelligent control and design, industrial automation, CAD/CAM, and MEMS. He has developed algorithms for robot motion planning and control based on AI and agents theory, for assembly strategies and for dynamic simulation of robots. He is working on intelligent robotic systems for handling of non-rigid materials, microassembly automation and the optimal design of modular reconfigurable manipulators. He published more than 150 papers in conference proceedings and journals. He is a reviewer in more than 20 Journals and member of the editorial board of the Mechatronics Journal and International Journal of Automation and Control. He has been and is currently involved in research projects funded by Greek and European Union sources.

Laboratory Tour Schedule

September 7 (Monday), 2009

13:30－14:30	Seminar
15:00－17:30	Lab tour

15:00－15:30	Hirai Lab. (EastWing4F and Excel 3)
15:30－16:00	Kawamura Lab. (Excel 3)
16:00－16:30	Ozawa Lab. (EastWing 5F)
16:30－17:00	Ma Lab. (EastWing 5F)
17:00－17:30	Nokata Lab. (EastWing 4F)