

Seminar Series

MICRO-SCALE MANUFACTURING AUTOMATION

Professor James K. Mills

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Date: November 17, 2009 (Tuesday)

Time: 4:00pm - 5:00pm (Tea Reception at 3:30pm)

Venue: Room B6619, MEEM Conference Room

ABSTRACT

This presentation provides an insight into micro-scale manufacturing automation in various disciplines. The field of meso-manufacturing is briefly detailed. Examination of the current state of the art in meso-manufacturing is presented. At a smaller scale than found in meso-manufacturing, MEMS scale components are becoming more widespread in the market place with small scale consumer electronic products, automotive safety systems, and others driving this industry. MEMS devices traditionally have been essentially two dimensional in nature. This two dimensional aspect of the MEMS components has severely limited the applicability of MEMS devices to more complex applications. Hence, to expand the applications for which MEMS devices can be used, the need exists to find ways to automatically assemble two dimensional structures into three dimensional MEMS devices. Micro-assembly techniques which permit the assembly of two dimensional MEMS components are presented. These techniques form the basis for automated assembly of micro-scale components as presented using vision feedback of robotic devices. Finally, task automation of micro-scale biological processes is discussed. The motivation for such systems is discussed, as well as the various technologies required in the development of such advanced micro-scale processing systems.

BIOGRAPHY

James K. Mills graduated with the Bachelor's (EE) (Manitoba) and Master's (EE) (Toronto) in 1980 and 1982 and Ph.D. (ME) degree in 1987, specializing in control system design. His research interests have encompassed a number of related areas, including: robot control, design of actuators, localization, development of fixtureless assembly technology, design and control of high speed machines, development of neural network controllers, MEMS 3D assembly, MEMS robotic assembly task execution, micro-scale biological task control and automation. He and his students have published over 330 refereed conference and journal papers.

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All are welcome!

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