

Seminar Series

**Current Issues in Robot-Based Handling
on the Nanoscale**

by

Prof. Dr.-Ing. habil. Sergej Fatikow

**Division for Microrobotics and Control Engineering
(AMiR)
University of Oldenburg, Germany**

Date: Jan. 29, 2010 (Friday)

Time: 4:30pm- 5:20pm

Venue: LT-7, 4/F, Academic Building

ABSTRACT

The handling of micro- and nanoscale objects with an accuracy in the nanometer range is an important current trend in robotics. It is often referred to as nanohandling and is primarily understood as manipulation of objects, which may include their finding, grasping, moving, tracking, releasing, positioning, pushing, pulling, cutting, bending, twisting, etc. Automated nanohandling is one of the key challenges of microsystem technology and nanotechnology. It will enable high-throughput manufacturing of novel products and open up new application fields. Current research work in AMiR includes, amongst others, the development of new nanohandling robots; the investigation of novel automated nanohandling strategies; the development of advanced control methods; as well as the investigation of suitable real-time sensing technologies on the nanoscale. In his talk, Prof. Fatikow introduces his Division's research projects and applications being pursued. They include automated nanoassembly of AFM supertips inside SEM, handling and characterization of carbon nanotubes (CNT), electron beam induced deposition (EBiD) as a bonding and nanostructuring technology, automation issues in AFM-based nanohandling, characterization of biological objects by AFM/nanorobots, and others.

BIOGRAPHY

Prof. Dr.-Ing. habil. Sergej Fatikow studied computer science and electrical engineering at the Ufa Aviation Technical University in Russia, where he received his doctoral degree in 1988 with work on fuzzy control of complex non-linear systems. After that he worked until 1990 as a lecturer at the same university. During his work in Russia he published over 30 papers and successfully applied for over 50 patents in the area of intelligent control. In 1990 he moved to the Institute for Process Control and Robotics at the University of Karlsruhe in Germany, where he worked as a postdoctoral scientific researcher and since 1994 as Head of the research group "Microrobotics and Micromechatronics". He became an assistant professor in 1996. In 2000 he accepted an associate professor position at the University of Kassel, Germany. A year later, he was invited to establish a new Division for Microrobotics and Control Engineering at the University of Oldenburg, Germany. Since 2001 he is a full professor in the Department of Computing Science and Head of this Division. He is also Head of Technology Cluster Automated Nanohandling at the Research Institute for Information Technology (OFFIS) in Germany. His research interests include micro- and nanorobotics, automated robot-based nanohandling in SEM, micro- and nanoassembly, AFM-based nanohandling, sensor feedback on the nanoscale, and neuro-fuzzy robot control. He is author of three books on microsystem technology, microrobotics, microassembly, and nano-handling automation, published by Springer in 1997, Teubner in 2000, and Springer in 2008. He also published since 1990 over 60 journal papers and over 180 conference papers on micro- and nanorobotics, nanohandling automation, and intelligent robot control.

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All are welcome!

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