

Small-Scale Mobile Robotics

Presenter:

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Brief description:

This tutorial aims to analyze, design and build small-scale mobile robots for researchers interested in robotics, micro/nanotechnology, design, controls, mechanics, medicine, and bioengineering. It would cover the underlying micro/nano-mechanical principles, scaling laws, and actuation, sensing and powering principles of such tiny robots down to micron scale overall sizes. Besides the basic background knowledge, it includes the current trends in the literature, detailed case studies from research projects at NanoRobotics Lab at Carnegie Mellon, and discussions.

Presenter Biography:

Prof. Metin Sitti received the B.Sc. and M.Sc. degrees in electrical and electronics engineering from Bogazici University, Istanbul, Turkey, in 1992 and 1994, respectively, and the PhD degree in electrical engineering from University of Tokyo, Japan, in 1999. At University of California at Berkeley, he was a research scientist during 1999-2002 and a lecturer in 2002. He is currently a professor in Department of Mechanical Engineering and Robotics Institute at Carnegie Mellon University. He is the director of NanoRobotics Lab and Center for Bio-Robotics. His research interests include magnetically- and cell-actuated mobile micro-robots, bio-inspired micro/nano-materials, bio-inspired miniature robot locomotion, medical miniature robots, and micro/nano-manipulation. He received the SPIE Nanoengineering Pioneer Award in 2011, National Science Foundation CAREER Award in 2005, and IBM Smarter Planet Award in 2012. He was invited to the World Science Festival in 2013 as a keynote speaker on Cellular Surgeons. He was appointed as the Adamson Career Faculty Fellow during 2007-2010. He was the Vice President of the Technical Activities in the IEEE Nanotechnology Council during 2008-2010. He was elected as the Distinguished Lecturer of the IEEE Robotics and Automation Society during 2006-2008. He received the Best Paper Award in the IEEE/RSJ International Conference on Intelligent Robots and Systems in 2009 and 1998, the first prize in the World RoboCup Micro-Robotics Competition in 2012 and 2013, the Best Biomimetics Paper Award in the IEEE Robotics and Biomimetics Conference in 2004, and the Best Video Award in the IEEE Robotics and Automation Conference in 2002. He founded nanoGripteck Inc. in 2009 to commercialize gecko-inspired adhesives. He was the guest editor-in-chief of IEEE/ASME Trans. on Mechatronics during 2011-2012 and the Associate Editor for IEEE Trans. on Robotics during 2007-2011 and for ACS Applied Materials and Interfaces during 2010-2012. He is the editor-in-chief of Journal of Micro-Bio Robotics currently.