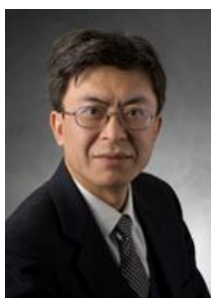


Nanorobotic Tools for Bioinspired Microagents



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Abstract

As technology progresses towards smaller and smaller systems enabled by micro-/nanoscale functional elements, one barrier yet to be adequately addressed is the fabrication of such systems with an overall size at the micro and nanometer scale. Current IC and micro-/nanoelectromechanical systems (MEMS/NEMS) fabrication techniques produce chips that are millimeter to centimeter in size, orders of magnitude too large for such applications as intracellular sensing, drug delivery, and swallable surgery enabled by artificial bacterial flagella [1] and other bio-inspired microagents. Segmented nanostructures are used to build nanorobotic tools based on internal tunneling and optical coupling [2, 3].

Biography

Lixin Dong is an Assistant Professor at Michigan State University. He received the B.S. and M.S. degrees in Mechanical Engineering from Xi'an University of Technology (XUT) in 1989 and 1992, respectively. He became a Research Associate in 1992, a Lecturer in 1995, and an Associate Professor in 1998 at XUT, where he has served as the head of the Department of Mechatronics Engineering from 1997 to 1999. He received his Ph.D. degree in Micro Systems Engineering from Nagoya University in 2003, and became Assistant Professor at Nagoya University in 2003. In 2004 he joined Swiss Federal Institute of Technology (ETH) Zurich as a Research Scientist, and has been a Senior Research Scientist at ETH Zurich from 2005 to 2008, where he led the NanoRobotics Group in the Institute of Robotics and Intelligent Systems (IRIS). His main research interests include nanorobotics, nanoelectromechanical systems (NEMS), and enabling nanomanufacturing technologies for fluidic, photonic, biomedical, and other nanosystems. He received the National Science Foundation Faculty Early Career Development (CAREER) Award in 2011, the IEEE T-ASE Googol Best New Application Paper Award in 2007, and many other awards. He is a senior member of IEEE and serves as an Associate Editor of the IEEE Transactions on Nanotechnology. He is Chair of the Technical Committee (TC) on Nano Energy, Environment and Safety (NEES), IEEE Nanotechnology Council (NTC), a representative of IEEE Robotics and Automation Society in IEEE NTC AdCom (12-13), and a representative of IEEE Trans. on Nanotechnology in the Publication Activities Board (PAB), IEEE Robotics and Automation Society (12-).

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