Micro-Nano Robotics Development and Applications in China

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Abstract
Micro-nano robot is a swimming robot with the scale of 1nm to 100 mm or the manipulation robot resolution about 1 nm to 100 nm. Resent years in China, the nano manipulation robotics has been developed with optical microscope (OM), atomic force microscope (AFM), scanning electron microscope (SEM) for clone, cell manipulation and IC development and measurements. For swimming robots with various driving method has been developed, the chemical self actuating, infrared driving and magnetic driving. The nano robotics is the technology with sensing, driving/actuation and control. The nano manipulation robot with the nano image processing, feed forward-feedback mix control has been developed. The single mechanical, chemical and electrical measurement has been achieved. The carbon nanotube, graphene has been assembled and fabricated, tested by the nano manipulation robotics. Micro-nano robotics is key technology for Made in China 2015 and will develop and apply rapidly in China.

Biography
Lining Sun is a professor and a PhD supervisor. He is currently a director of Robotics and Microsystems Center in Soochow University, and a President of College of Mechatronic Engineering in Soochow University. He gained China National Funds for Distinguished Young Scientists. Now he is a Chang-Jiang Scholar Professor in the Ministry of Education, a Subject Matter Expert of Robotic Technology in the Tenth Five-Year “863” Program of China, and a main group leader of MEMS major projects in the Tenth Five-Year “863” Program of China, and an expert of Advanced Manufacturing Technology Expert Group in the 11th Five-Year “863” Program of China. His current research interests include micro-nano operational robot and equipment, advanced robot and control, and electromechanical integration equipment. He has directed more than 20 “863” Program, “973” Program, and National Natural Science Foundation of China. He gained two National Science and Technology Award Grade II and three Provincial Science and Technology Prize Grade I. He has more than 300 academic papers being published and has more than 20 patents of invention being authorized.