Abstract

While the futuristic vision of micro and nanorobotics is of intelligent machines that navigate throughout our bodies searching for and destroying disease, we have a long way to go to get there. Progress is being made, though, and the past decade has seen impressive advances in the fabrication, powering, and control of tiny motile devices. Much of our work focuses on creating systems for controlling micro and nanorobots in liquid as well as pursuing applications of these devices. Larger scale microrobots for delivering drugs to the retina to treat eye diseases such as age related macular degeneration and retinal vein and artery occlusion are moving towards clinical trials. As size decreases to the nanoscale, we have been inspired by motile bacteria, such as E. coli, and have developed nanorobots that swim with a similar technique. Applications we pursue at these scales are for the treatment of breast cancer and cerebral infarctions. As systems such as these enter clinical trials, and as commercial applications of this new technology are realized, radically new therapies and uses will result that have yet to be envisioned.
**About the Speaker**

**Brad Nelson** is the Professor of Robotics and Intelligent Systems at ETH Zürich. His primary research focus is on microrobotics and nanorobotics emphasizing applications in biology and medicine. He received a B.S.M.E. from the University of Illinois and an M.S.M.E. from the University of Minnesota. He has been at Honeywell and Motorola and served as a United States Peace Corps Volunteer in Botswana, Africa, before obtaining a Ph.D. in Robotics from Carnegie Mellon University in 1995. He was Assistant Professor at the University of Illinois at Chicago (1995-1998) and Associate Professor at the University of Minnesota (1998-2002). He became Full Professor at ETH Zürich in 2002. He has received a number of awards and serves on several editorial boards. He has been Department Head of Mechanical and Process Engineering, Chairman of the ETH Electron Microscopy Center, and is a member of the Research Council of the Swiss National Science Foundation.

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**All are welcome!**

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