



University
of Basel

Department of
Biomedical Engineering



Selected research topics in Biomedical Engineering:

Robot- & Computer-Assisted Surgery

Location: DBE, Hegenheimermattweg 167B, Lecture Hall 02.097

Date & Time: Wednesday 15.11.2023 13:15 – 15:00

The Robotics Part of Micro and Nano Robots

Prof. Brad Nelson

ETHZ Zurich

Abstract

Micro and nano robots have made great strides since becoming a focused research topic over two decades ago. Our group, as well as others, maintain that using biocompatible magnetic composites with externally generated magnetic fields and field gradients is perhaps closest to clinical application. One of the most challenging aspects of the field is in the development of the magnetic navigation system (MNS) that generates the fields and field gradients needed for microrobot locomotion, which will be the main focus of the talk.

Biosketch

Brad Nelson has been the Professor of Robotics and Intelligent Systems at ETH Zürich since 2002. He received the B.S. degree in Mechanical Engineering from the University of Illinois at Urbana-Champaign and the M.S. degree in Mechanical Engineering from the University of Minnesota. He has worked as an engineer 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 an Assistant Professor at the University of Illinois at Chicago (1995-1998) and an Associate Professor at the University of Minnesota (1998-2002).

Prof. Nelson's primary research focus is on microrobotics and nanorobotics emphasizing applications in biology and medicine, particularly medical robotics. He has received a number of awards and more than a dozen Best Paper Awards at major robotics conferences and journals. He is a Fellow of IEEE and ASME and serves on the editorial boards of several journals. He has chaired several international workshops and conferences, has served as the Head of the ETH Department of Mechanical and Process Engineering, the Chairman of the ETH Electron Microscopy Center (EMEZ), and as a member of the Research Council of the Swiss National Science Foundation.