

Workshop on Nanosensors: Self-Organization and Swarm Robotics

BIOGRAPHIES

Dr. Jonathan Bachrach

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Jonathan Bachrach is a principle research scientist at Makani Power where he researches programmable matter. Previously, he was a research scientist at the MIT Computer Science and Artificial Intelligence Lab (CSAIL) researching programming languages, spatial computing, and robotics. Before MIT, he held postdocs at Stanford and UC Berkeley, was a researcher at IRCAM in Paris, developing new musical platforms, and a principle software engineer at Harlequin Inc. (RIP), working on a compiler and runtime for the Dylan programming language. He studied cognitive science, computer science, and visual arts, receiving a B.S. degree from the University of California at San Diego and MS and PhD degrees from the University of

Massachusetts at Amherst.

Dr. John Barker, FBIS, FRAS, FRSE

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BSc Hons Physics , University of Edinburgh (1966), MSc , Durham University (1967). PhD Theoretical Physics, University of Warwick (1969). Science Research Council Personal Research Fellowship, Physics Department, University of Warwick (1969-70). Lectureship in Theoretical Physics in University of Warwick in October (1970 -1984). During the late 1970's worked at the IBM T.J. Watson Laboratory, Yorktown Heights; North Texas State University and Colorado State University where began investigations into the physics and modelling of ultra-small and low-dimensional semiconductor devices and structures. Affiliate Professor of Physics at Colorado State University(1979-1983). In 1985, appointed as a Professor in the Department of Electronics

and Electrical Engineering where he became a co-founder of the Nanoelectronics Research Centre (and Theory and Modelling Group) at Glasgow University. Fellow of the Royal Society of Edinburgh (1990) where he was Convenor of the Mathematics section and more recently of Convenor of the Electronics and Electrical Engineering section. Has been a member/chairman of a number of SERC and EPSRC committees. He is a Fellow of the Royal Astronomical Society and also a Fellow of the British Interplanetary Society. Member of Dark Skies. Affiliate member of the Institute of Physics. Long standing interest in theoretical physics, computational methods, device modelling and electron transport theory including hot electron physics and the quantum transport theory of semiconductors. Research interests mainly in Nanotechnology and Nanoelectronics, include studies in single electronics, quantum traffic theory, quantum transport theory, non-equilibrium Green function theory, silicon-germanium HMOS devices, semiconductor device modelling, Monte Carlo simulation, molecular electronics, nanoelectronics, massively parallel computer architectures, confocal microscopy of arteries, impact crater detection, artificial olfaction, smart dust. He has published over 320 scientific papers.

Dr. Stephen F. Bush, Senior Member IEEE

Research Scientist, Algorithmic Communications Network Theory

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Stephen F. Bush is a researcher in Algorithmic Communications Network Theory at the GE Global Research Center. Stephen explores novel concepts in complexity and algorithmic information theory for applications ranging from network management and wireless ad hoc networking to RNA sequence analyses and novel concepts in nanotechnology-based networking. Dr. Bush has been the Principal Investigator for many DARPA and Lockheed Martin sponsored

research projects including: Active Networking (DARPA/ITO), Information Assurance and Survivability Engineering Tools (DARPA/ISO), Fault Tolerant Networking (DARPA/ATO) and Connectionless Networks (DARPA/ATO), an energy aware sensor network project. Stephen coauthored a book on active network management, titled Active Networks and Active Network Management: A Proactive Management Framework, published by Kluwer Academic Publishers.

Dr. Michael A. Carpenter, Assistant Professor
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Dr. Michael A. Carpenter received his BS in chemistry from the State University of New York College at Geneseo in 1991, and a PhD in physical chemistry from the University of Rochester, NY in 1996. He was a postdoctoral associate at Cornell University from 1996 to 1998, and was a postdoctoral associate at Pacific Northwest National Laboratory from 1998 to 2000. Since 2000, he has been a staff scientist at Albany Nanotech and as of 2002 was appointed as an assistant professor in the College of Nanoscale Science and Engineering at the University at Albany-SUNY. He has research interests in developing nanotechnology enabled chemical sensors for environmental and industrial applications. In particular he has active research programs on developing plasmonic based chemical sensors compatible with harsh environments, quantum dot based hydrocarbon sensors, Pd alloy hydrogen sensors and integration of nanotechnology enabled chemical and physical sensors into remote stand alone sensing systems.

Dr. Nikolaus Correll, Post-Doctoral Fellow
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Nikolaus is a post-doctoral fellow at the Distributed Robotics Lab, MIT CSAIL, where he works with Daniela Rus since he graduated from EPFL in October 2007 with a PhD in Computer Science. Before joining MIT, Nikolaus worked with Alcherio Martinoli at the Swarm-Intelligent Systems Group at EPFL and as a research assistant in the Collective Robotics Group at Caltech in 2003. In summer 2005, Nikolaus participated at the 2nd EURON/GEOPLEX Summer School on Modeling and Control of Complex Dynamical Systems at the University of Bologna. Nikolaus earned a Master's degree in Electrical Engineering from the Swiss Federal Institute of Technology Zurich (ETH Zürich) in spring 2003. He wrote his master's thesis at the Collective Robotics Group at the California Institute of Technology, Pasadena, CA, USA, about collaborative coverage supervised by Alcherio Martinoli and Joel Burdick, and spent a term at Lunds Tekniska Högskola (Lund Institute of Technology, Sweden) as an exchange student at the Department of Automatic Control working with Rolf Johansson in 2002. Before moving to ETH Zuerich in 2000, Nikolaus studied electrical engineering at the Technical University of Munich from 1998.

Dr. Sanjay Goel, Associate Professor
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Sanjay Goel is an Associate Professor in the School of Business at the University at Albany, SUNY. He is also the Director of Research at the New York State Center for Information Forensics and Assurance at the University. The center is collaborative effort between the University at Albany, NYS Police, and CSCIC. He is also represents UAlbany as part of the Capital Region Cyber Crime Partnership which is a joint partnership with the NYS Police and the New York Prosecutors Training Institute which focuses on assisting law enforcement in

dealing with computer-related crime. Before joining the University, he worked at the General Electric Global Research Center. Dr. Goel received his Ph.D. in Mechanical Engineering in 1999 from Rensselaer Polytechnic Institute. He is supporting a multidisciplinary research group in information security. His group is currently engaged in several projects including: investigation of computer security threats such as botnets and malware propagation, risk analysis, information classification, business continuity, disaster recovery, security models based on biological paradigms of immune systems, epidemiology, and cellular pathways. His research also delves into self-organization and self assembly in several applications, in Dr. Goel teaches several classes including computer networking and security, information security risk analysis, security policies, enterprise application development, database development and Java language programming.

Dr. Shinsuke Hara, Associate Professor

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Shinsuke Hara is an associate professor in the advanced communications laboratory, department of electronics, information systems, and energy engineering in the graduate school of engineering, Osaka University, Osaka, Japan since 1997. Dr. Hara received his B.E., M.S. and Ph.D. in communication engineering from Osaka University. In the past he has served as a lecturer at Osaka University in 1996 and as a visiting researcher at TU-Delft China in 1995. His research interests are intellectual multimedia signal processing using wireless communication systems and his hobbies include running and paragliding.

Dr. Constantinos Mavroidis, Professor

Mechanical and Industrial Engineering, Northeastern University

Visiting Scientist, Massachusetts General Hospital/Shriners Hospital



Dr. Constantinos Mavroidis is a Professor of Mechanical and Industrial Engineering at Northeastern University in Boston MA since July 1, 2006. He is also a Visiting Scientist at the Massachusetts General Hospital and Shriners Hospital for Children in Boston, MA since October 2001. He was an Associate Professor in the same department from January 1, 2004 to June 30, 2006, an Associate Professor at the Department of Mechanical and Aerospace Engineering at Rutgers University (2001 - 2004) and an Assistant Professor at the same department (1996 – 2001). He received the Diploma in Mechanical Engineering from the National Technical University of Athens, Greece in 1988 and the M.S. and Ph.D. degrees in Robotics from the University of Paris VI, France, in 1989 and 1993 respectively. From 1993 to 1996 he was a Post-Doctoral Associate at the Department of Mechanical Engineering at the Massachusetts Institute of Technology. Dr. Mavroidis is a Fellow of the ASME and has received numerous prestigious awards including the 2004 Best of What's New Award in the Personal Health category from the magazine *Popular Science* for the invention: "Smart Orthotic Device Using Electrorheological Fluids". He has authored and co-authored more than 150 journal and conference papers and book contributions. He is a Technical Editor of the *IEEE/ASME Transactions on Mechatronics*, Member of the Editorial Board of the *Journal of Computational and Theoretical Nanoscience* and of the journal *Bionanotechnology*.

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Ari Requicha holds the Gordon Marshall Chair in Engineering and is a Professor of Computer Science and Electrical Engineering at USC, where he also directs the Laboratory for Molecular Robotics (LMR) since 1994. From 1986 to 2003 he directed at USC the Programmable Automation Laboratory, which merged with LMR in 2003. He received the Engenheiro

Electrotécnico degree from the Instituto Superior Técnico, Lisbon, Portugal, in 1962, and the Ph.D. in Electrical Engineering from the University of Rochester in 1970. He was a college and high school Valedictorian, and is a Fellow of the IEEE and of the American Academy of Nanomedicine. Requicha is one of the worldwide 282 Computer Scientists listed in the ISI Web of Knowledge as highly cited researchers for the decades 1980-1999. He received the USC Senior Research Award in 2006, the first-ever Pierre Bezier Award in solid modeling at the 2007 ACM Solid and Physical Modeling Symposium, as well as several best paper awards. He is the editor-in-chief of the IEEE Transactions on Nanotechnology, has been an editor for the ACM Transactions on Graphics, the IEEE Transactions on Robotics and Automation, and other journals, and has served on numerous conference program committees. He is currently a Co-Chair of the Robotics and Automation Society Technical Committee on Micro and Nano Robotics.

Dr. Metin Sitti, Associate Professor

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Metin Sitti is currently an Associate Professor at the Department of Mechanical Engineering and Robotics Institute at Carnegie Mellon University and has been at the CMU since 2002. He received his Ph.D. in Electrical Engineering from the University of Tokyo in 1999 and worked in the Institute of Industrial Science and the Intelligent Mechantronics Laboratory. He received an M.S. and B.C. in Electrical and Electronics Engineering from Bogazici University in Istanbul, Turkey in 1994 and 1992 respectively. In the past, he has served as a research scientist and lecturer at the Department of Electrical Engineering and Computer Sciences, Robotics Laboratory at the University of California at Berkeley from 1999-2002. His research interests are Micro/Nanorobotics, nanomanufacturing, MEMS/NEMS, biomimetic micro/nanosystems,

directed self-assembly, bionanotechnology , haptic interfaces, and tele-robotics.