

Seminar



A Wonderful Journey to the Intersection of Microfabrication and Bio/Chem Detection

Dr. Masoud Agah

November 13, 2019 | 12:00 - 1:00pm | Scott Hall 4N200

Seminar abstract

In this talk, I will discuss the evolution of research at VT MEMS Lab through time and discuss the lab's navigation through the microscale world to develop chips for bio/chem applications. I will provide a glance at both research thrusts, Bio (Cellular) MEMS and Micro Analytical Chemistry. First, the use of microfluidics for deciphering cancer cell biomechanical and bioelectrical properties is discussed. I will demonstrate how biophysical attributes of cells at the single-cell level can be used as a potential marker for cancer diagnosis or treatment efficacy. For the second thrust, I will demonstrate the innovations and research accomplishments from nano-structured material processing and synthesis to the development of key components of micro gas chromatography instruments including preconcentrators, microfluidic separation columns, and gas detectors. I will show how MEMS, GC, and machine learning integration has provided new opportunities for various applications from personal exposure monitoring to rapid identification of illegal adulteration of important substances.

Speaker bio

Masoud Agah received his B.S. and M.S. degrees in Electrical Engineering from Sharif University of Technology (SUT), Iran, in 1996 and 1998, respectively, and his Ph.D. degree from the University of Michigan, Ann Arbor, in 2005. He joined the faculty of Virginia Tech in August 2005, where he is currently the Virginia Microelectronics Consortium (VMEC) Professor of Engineering in the Bradley Department of Electrical and Computer Engineering and serving as the VMEC Operations Committee Chair. In 2005 he established the VT MEMS Laboratory where he has focused his research on environmental and biomedical applications of MEMS and microfluidics. Dr. Agah, a senior IEEE member, received the National Science Foundation CAREER Award in 2008 for his research on micro gas chromatography, the Virginia Tech's College of Engineering Outstanding New Assistant Professor Award in 2009, the Graduate School's Outstanding Dissertation Advisor Award in 2010, and the College of Engineering's Faculty Fellow Award in 2011. He is a Faculty Fellow in the Virginia Tech Office of the Vice President for Research and Innovation leading the Micro/Nano Fab for the University Shared Research Facilities Initiative. He co-founded Zebra Analytix, Inc. in 2018 and currently serves as its CTO and board member to commercialize microGC technologies invented at his lab. He is also the founding faculty director of Virginia Nanotechnology Networked Infrastructure (VNNI) which is in the planning and implementation stage within the Commonwealth of Virginia.

The DSN-I Seminar Series is hosted by the Device Science and Nanofabrication Initiative. DSN-I Seminars target researchers in micro and nanofabrication technologies or devices, with the goal of strengthening the user community of the new Scott Hall nanofabrication facility and other shared infrastructure.