

College of Engineering Seminar Series

Meso-Scale Hydro-colonoscopy Robotics

Erdem Erdemir, Ph.D.

*Assistant Professor of Computer Science at Tennessee State University
Director of Biomechatronics and Agricultural Robotics Lab, TIGER Institute*

Tennessee State University, Torrence Hall, Room 126

Friday, March 2nd, 2018, 1:00pm

(Refreshments will be served)

Countries adapting to Westernization or experiencing new or renewed economic development have seen the greatest increase in instances of colorectal cancer among all countries worldwide in the past 30 years. At the same time, low and middle-income countries (LMIC) often lack the resources to adequately screen patients for colorectal cancer; and as a result, underdiagnoses is far too common. Screenings for colorectal cancer in LMICs largely rely on Fecal Occult Blood (FOB) testing-- a screening prone to false positives that cannot detect cancerous polyps until they reach advanced stages requiring operation. Statistics on incidence of colorectal cancer in LMICs suffer from inadequate detection and reporting.

The goal of Hydro-colonoscopy research is to provide a low-cost alternative to colonoscopy and biopsy in low-resourced areas, which would expand the availability of screening programs to a greater number of patients with Crohn's disease, ulcerative colitis, and bowel cancer in developing and newly developed countries. Using low-cost materials, the device will be intuitive to operate, will reduce dependence on specially-trained medical staff, and will alleviate pain and discomfort typically associated with endoscopic colonoscopies. The platform we propose has the potential to replace colonoscopy with a soft-tethered endoscopic capsule that will reduce the risk of perforation while lowering the learning curve to administer colonoscopy and biopsy.



Erdem Erdemir, Ph.D. received his B.S. and M.S. from the Bogazici University in Mechanical Engineering and Systems & Control Engineering. He has industry experience of three years as an R&D Leader and project engineer on the development and implementation of intelligent automation systems in GE-GSD. He received his Ph.D. from Vanderbilt University in Electrical Engineering and Computer Science. The focus of his doctoral research was imitation learning for humanoid robotics. During his Ph.D. studies, he worked at the STORM, CIM and CIS Laboratories at Vanderbilt University and RISL Lab at TSU. He stayed for a post-doctoral training experience on meso-scale robotics at STORM Lab in Vanderbilt University. He joined the faculty at Tennessee State University in the fall of 2014 and is currently the assistant professor of computer science and the director of the Biomechatronics and Agricultural Robotics Lab at TIGER Institute. He is honored with the award of IDA McClain Fortitude Faculty Award for the exceptional commitment to students via education and mentorship.

His research interests are in meso-scale robotics, deep learning, smart prosthetics, and agricultural mechatronics systems.

Excellence
is our Habit!

"Think. Work. Serve."