Electrical & Computer ENGINEERING

Carnegie Mellon University

Seminar

Imaging and Inertial Sensing Technologies for Autonomous Vehicles

Dr. Igor Prikhodko

February 3, 2020 | 11:30 - 12:30pm | Scott Hall 6142

Seminar abstract

In this talk we discuss Analog Device's approach to enable safe, reliable autonomous transport by developing highly accurate, real-time 3D views around autonomous vehicles. Our perception sensor suite uses RADAR, LIDAR, cameras, and IMUs to provide a trustworthy position of a vehicle in GPS-denied environment. We explain how data from high-performance imaging and inertial sensors are fused together to give the vehicle its sense of sight, while the IMU gives the vehicle its sense of feeling and ensures it maintains its heading. Specifically, we experimentally demonstrate strapdown inertial navigation for automobiles with position errors reaching GPS-like accuracies by using a tactical-grade IMU and visual odometry. Finally, we analyze the propagation of sensor errors into position error and compare theory with field test results.

Speaker bio

Igor Prikhodko, Ph.D. is a Staff MEMS Design Engineer at Analog Devices Inc in the greater Boston area, where he focuses on R&D of advanced inertial MEMS. He has 4 issued US Patents on gyroscope design which is currently in production as ADIS16500 family of Inertial Measurement Units. Dr. Prikhodko received B.S., M.S. degrees in Mechanics and Mathematics from the Moscow State University, Russia in 2007 and the M.S. and Ph.D. degrees in Mechanical and Aerospace Engineering from the University of California, Irvine in 2008 and 2013, respectively. His work reflected in over 30 peer-reviewed journal and refereed conference papers as well as nominated with an Outstanding Paper award at Transducers 2011, the Best Paper award at IMAPS Device Packaging Conference 2012, and an Outstanding Presentation award at Transducers 2013. He serves as a reviewer for major journals in the fields of MEMS and as a program committee member and a treasurer for the IEEE Inertial Sensors and Systems 2014 through 2020.

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.

Seminar notes: Lunch will be served.