



**Riad Hammoud**

**Wednesday, March 29, 2017**

**2:30 PM**

**Indiana Memorial Union**

**Oak Room**

## **Shared Analytics and Autonomy: Lessons learned, Challenges and Opportunities**

**Abstract:** Effective problem-solving is achieved by dividing tasks between intelligent systems and human operators. In recent years we've seen continuous push for the design of agile, hybrid teams of multiple humans teamed with intelligent machines. This is fundamentally challenging the current paradigm of human-intelligent machine systems design by changing the focus from full automation and substitution of human capability with machines to an integrated fabric enabling superior collective problem solving.

In this seminar, I will talk about my recent work on shared analytics and autonomy in three research areas: multi-source data association, intelligent vehicles, and robotics. I will show how this human-machine teaming process led to rapid generation of useful data analytics products, safe driving and successful execution of complex robotics tasks. I will dive into some details of key algorithmic components of video-chat analytics, robotics and Advanced Driver Assistance Systems (ADAS), including: video exploitation (e.g., moving objects tracking, and recognition), tracks representation and measurements mapping (e.g., deep learning features, geo-registration, eye-gaze measurements), multi-source data association, perception (e.g., occupancy map, shape fitting), and robotics arm path planning and gripper control. Finally, I will discuss some limitations of state-of-the-art techniques and highlight future opportunities.

**Biography:** Riad I. Hammoud is a principal investigator, senior principal researcher, and team lead at BAE Systems (Greater Boston, MA), working on sensor processing and exploitation, computer vision, machine learning and data science approaches. His work in the last five years has been funded by various government agencies including AFRL, DARPA, ONR, and IARPA. It focuses on large-scale, real-world scenarios, multi-source/INT data, with the goal of building intelligent analytics and autonomous systems that have real world impact. Riad received a MS degree in Controls of Systems and a PhD in Computer Vision and Robotics from UTC and INRIA (France) late 2007 and early 2001, respectively. Before joining BAE Systems, Riad was at Tobii-Dynavox (Pittsburgh, PA) and Delphi Automotive Systems (Kokomo, IN) working on Assistive Technologies (eye gaze tracking, speech generative devices, eye-controlled power-wheelchair) and Active Safety Systems (forward collision warning, driver drowsiness, etc.) He joined Seth Teller's team at MIT as a "collaborating Researcher" to work on the DARPA Robotics Challenge (2012-2015). Dr. Riad Hammoud published numerous conference papers, patents, journal articles, chapters and Springer books. He served as guest editor of three special issues of top journals in computer vision. He also serves on the technical program committee of several top IEEE conferences and workshops. He continues to serve as associated editor of IEEE Transactions on Intelligent Transportation Systems (ITS), Program Chair of the IEEE CVPR workshop series on "Perception beyond the Visible Spectrum (PBVS)" and editor-in-chief (with Prof Larry Wolff) of the Springer book series on "Augmented Vision and Reality". Dr. Riad I. Hammoud taught at several universities of Grenoble, mentored summer interns and junior engineers, and gave guest lectures and seminars at several renowned academic institutions including MIT and Boston universities.

