

## Robotics, Automation & Dynamical Systems (RADS) Seminar Mechanical Engineering Department

Speaker: **Dr. Venkat Krovi**, Automotive Engineering and Mechanical Engineering,  
Clemson University  
When: Tuesday, March 21st, 10:00 – 11:00AM  
Where: 310 Kelly Hall

### A Distributed Robotic Systems Roadmap for Vehicle Automation Systems

For over 50 years now, the robotics “Sense-Think-Act” paradigm has enabled extending the reach of humans for manipulating, interacting with and transforming the world. However, a *next-generation Distributed Robotic System paradigm* has been slowly emerging capitalizing on the triple convergence of computation, communication and miniaturization. The *principal opportunities* within this new paradigm now lie in building upon loosely-interconnected heterogeneous systems-of-systems and engineering high-performance/high-confidence operational capacities in the presence of uncertainties. In this context, my research has focused on developing *novel design-architectures* and *scalable-control approaches* for modulating physical power (motions/forces) in Distributed Robotic Systems to unlock this “power of the many” in emerging applications.

The past few years have seen a tremendous growth in both innovative research activities as well as fielded deployments of vehicle automation systems acting in direct support of and in a symbiotic relationship with human partners. In this talk, I'd like to explore the extension of the Distributed-Robotic-System paradigm to serve as a roadmap for enhancing the quality (performance, stability, safety) of robotic interactions between interconnected human-robot systems. I will also briefly review my past research efforts in: (a) distributed payload transport; (b) quantitative rehabilitation; (c) video-based articulated-multibody analysis; and (d) quantitative skill analysis; that serve to ground my work. Please visit <http://mechatronics.eng.buffalo.edu> for further details.

#### Brief Biography



Prof. Venkat N. Krovi is currently the Michelin Endowed Chair Professor of Automotive Engineering and Mechanical Engineering at Clemson University since August 2016. Previously he was a Professor of Mechanical and Aerospace Engineering at State University of New York at Buffalo, with adjunct appointments in departments of Electrical Engineering (School of Engineering) and Gynecology-Obstetrics and Pathology & Anatomical Sciences (School of Medicine).

*Invent the Future*

His research interests are in the lifecycle treatment (design, modeling, analysis, control, implementation and verification) of novel robotic and mechatronic systems (including surgical robots), focusing both on theoretical formulation and experimental validation. His work has been funded by NSF, DARPA, ARO as well as numerous state and industrial grants and has received multiple awards, including the National Science Foundation (NSF) CAREER Award, Petro-Canada Young Innovator Award, several best poster, conference and journal paper awards. His work has been published in more than 200 journal/conference articles, book chapters and patents. He held a variety of international leadership positions within IEEE and ASME, served on many funding agency review panels, and participated in various strategic planning workshops. He is a Fellow of the ASME. Further details are available from <http://mechatronics.eng.buffalo.edu>

Host: Dr. Saied Taheri & Dr. Pinhas Ben-Tzvi