MAE Seminar SERIES

Perception, Planning and Control for Autonomous Vehicles

THURSDAY, NOVEMBER 14

3:30 PM

101 DAVIS

ABSTRACT

UxVs (Unmanned Aerial/Ground/Surface/Underwater Vehicles) are expected to expand their applications to several civilian domains such as Autonomous Driving, precision agriculture, infrastructure monitoring & disaster response. However for these UxVs to perform these tasks with full autonomy they must satisfy multiple requirements: 1) Navigate in GPS-denied Environments 2) Sense and Avoid Obstacles 3) Able to determine interesting phenomenon. In this talk, I will give an overview of our algorithms on combining vision with Inertial Measurement Unit and GPS for accurate state estimation of the vehicle. I will describe our algorithms for mapping using thermal, visual and LIDAR sensors that enable autonomous navigation in various challenging conditions. I will then describe our path planning method, based on RRT (Rapidly exploring random tree) for obstacle avoidance. A major portion of the talk will be on applications of the above algorithms to real vehicles (aerial, ground and underwater vehicles) and the lessons that we have learned i.e. what worked and what didn't and how we should go about building such systems.

Dr. Sri Saripalli

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BIO SKETCH

Srikanth Saripalli is an Associate Professor in Mechanical Engineering department and the Co-Director for Center for Autonomous Vehicles and Sensor Systems (CANVASS) at Texas A&M University. His research focuses on robotic systems: particularly in air and ground vehicles and necessary foundations in perception, planning and control for this domain. He is currently interested in developing and deploying Autonomous Shuttles on campus and in cities. In his lab (http://unmanned.tamu.edu) he is developing fleets of autonomous vehicles that are shared and electric. He has deployed these autonomous shuttles on a hotel campus and is currently deploying these shuttles on Texas A&M campus and in downtowns. He is also interested in developing such autonomous shuttles for mobility challenged and para transit applications. On the other end he is interested in developing Autonomous 18 wheeler trucks for long-haul freight movement.

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