



TOPIC	(Enter Topic here)
ORGANIZERS	Student Leadership Council and Faculty of ACIT Institute and TECHLAV Center
AREA	
SPEAKER	Javier Puig-Navarro
DATE	Friday November 6, 2020
TIME	3:00 – 4:00 P.M. (EST)
VENUE	Webex video conferencing <a href="https://ncatedu.webex.com/ncatedu/j.php?MTID=mb428abd5fbcf62b44f916584701a2b53">https://ncatedu.webex.com/ncatedu/j.php?MTID=mb428abd5fbcf62b44f916584701a2b53</a>
FEES	No Charge

## SYNOPSIS

This seminar will give a brief overview of a time-critical cooperative framework for autonomous mobility of a fleet of heterogeneous vehicles operating in challenging scenarios. Multi-agent motion planning in cluttered scenarios is a challenging and resource intensive problem. To mitigate this, we will reexamine the backbone of path-planning algorithms, the proximity queries that determine whether a path is collision free; we will leverage silhouette information from nearby obstacles to expedite solutions through narrow passages; and will smoothen the resulting solution to meet desired continuity and differentiability requirements. For the execution of these smooth 4D trajectories a non-linear path-following algorithm with guaranteed performance bounds will be introduced. Finally, to ensure the vehicles maintain safe separation as they are hit with disturbances, such a wind gust, a distributed time-critical coordination algorithm that achieves along-track synchronization and enforces temporal constraints will be presented.

## ABOUT THE SPEAKER



and network topology control for distributed systems.

Javier is a PhD student in the Department of Aerospace Engineering at the University of Illinois at Urbana-Champaign (UIUC). He earned a bachelor's and a master's degree in aerospace engineering from the Polytechnical University of Valencia in Spain. Currently, Javier is finishing his doctoral requirements at the Autonomous Integrated Systems Branch at NASA LaRC. His research interests include new proximity and geometric queries to expedite motion planning, autonomous design of feasible 4D trajectories in cluttered environments, robust non-linear controls with safety certificates, and its applications to flight control systems and path-following algorithms, as well as distributed cooperative strategies for heterogeneous vehicles,