



<b>TOPIC</b>	<b>Deep Neural Network Enhanced VSLAM Landmark Selection</b>
<b>ORGANIZERS</b>	Student Leadership Council and Faculty of ACIT Institute and TECHLAV Center
<b>AREA</b>	Robotics, VSLAM, Deep Neural Networks
<b>SPEAKER</b>	Dr. Patrick Benavidez
<b>DATE</b>	Friday April 7, 2017
<b>TIME</b>	3:00 – 4:00 P.M. (EST)
<b>VENUE</b>	Fort IRC 410, North Carolina A&T State University, UTSA and SIPI will be joining through video-conferencing
<b>FEES</b>	No Charge

## SYNOPSIS

Simultaneous Localization and Mapping (SLAM) is a method in robotics to map and navigate GPS-denied environments. Sensor data is mapped to odometer data to determine the correct placement in a map. Once a map is developed, a robot can navigate the map and remember where it has gone. Visual SLAM (VSLAM) is the natural extension with visual inputs from one or more cameras. Image based feature extraction is the main method used in acquiring sensory data in VSLAM. Features such as edges and corners are recorded in the map. In cases of complex, dynamic environments where VSLAM will likely be used, landmark selection becomes a difficult problem. Maps will contain transient features as objects move or disappear from the environment. With new methods of image classification, namely convolutional neural networks, landmarks can be selected based off of their known properties. This presentation will provide a roadmap for research towards a VSLAM algorithm that can find appropriate landmarks for navigation using deep learning.

## ABOUT THE SPEAKER



Dr. Patrick Benavidez received a B.S. degree in electrical engineering from the University of Texas at San Antonio in 2007. In the same year, Patrick began working on his master's degree while working for Southwest Research Institute. He received a M.S. degree in electrical engineering at the University of Texas at San Antonio and concluded his internship in 2010. He obtained his Ph.D. in August 2015 in electrical engineering at the University of Texas at San Antonio with initial funding provided by a Valero Graduate Research Fellowship and Scholarship. Mr. Benavidez recently received the following two awards for volunteering and outreach: "Most Exceptional Graduate Student" by the UTSA College of Engineering and a University Life Award for "Most Outstanding Graduate Student in the College of Engineering" by the UTSA Student Government. His doctoral research was supported in part by a Valero Research Excellence Award and through the UTSA Graduate School with Graduate Student Research Scholarship. Dr. Benavidez has supported professors in several grant writing efforts, while also mentoring numerous students for their master's thesis, and undergraduate capstone projects. His areas of interest include communication systems, control systems, robotics, cyber-physical systems, and systems of systems. He is currently an Assistant Professor of Research and Assistant Director of ACE Labs at The University of Texas at San Antonio.