**UT DALLAS**

*Electrical Engineering Seminar Series &*
*Dallas Chapter of IEEE Signal Processing Society Present*

# Fusion of Vision and Inertial Measurement Units for Mobile Navigation

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## 11am, Wed, September 22, 2010
## ECSS 2.102 (TI Auditorium)

Localization is a critical problem for building mobile robotic systems capable of autonomous navigation. I will present a novel visual odometry method to improve the accuracy of localization when a camera is viewing a piecewise planar scene. Discrete and continuous Homography Matrices are used to recover position, heading, and velocity from images of coplanar feature points. A Kalman filter is used to fuse pose and velocity estimates, along with measurements from an Inertial Measurement Unit and robot wheel encoders. Simulation and experimental results are presented to demonstrate the performance of the proposed method.

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Dr. Gans received his Ph.D. in systems and entrepreneurial engineering from the University of Illinois at Urbana-Champaign in 2005. He is an assistant professor of electrical engineering at The University of Texas at Dallas. Dr. Gans' research interests include nonlinear and adaptive control, with focus on vision-based control and estimation, robotics and autonomous vehicles. He is also involved in developing visualization and virtual reality platforms for accurate simulation of vision-based controllers. Prior to joining UT Dallas, he worked as a postdoctoral researcher with the Mechanical and Aerospace Engineering Department at the University of Florida and as a postdoctoral associate with the National Research Council, where he conducted research on control of autonomous aircraft for the Air Force Research Laboratory Munitions Directorate and developed the Visualization Laboratory for simulation of vision-based control systems. Dr. Gans has published over forty peer-reviewed conference and journal papers, and he holds two patents in these areas.

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