College of Engineering

The Robert W. Courter Seminar Series

Improved Wheeled Rover Localization via Autonomous Pseudo-Measurement Constraints

Chair and Associate Pro essor
!ep. o Mechanical and Aerospace "n#ineerin#
West $ir#inia %niversit&

A core capability to enable enhanced autonomy for robotics systems is reliable self-localization. Autonomous self-localization can be a challenge, especially in the absence of external aiding systems, such as GPS. Systems like GPS are unavailable or unreliable in many environments in hich the use of robots could offer many benefits. !his seminar ill discuss some research conducted in the "avigation #ab at $est %irginia &niversity to address some of these challenges for applications including heeled planetary exploration rovers and cooperative robots operating in GPS degraded environments. 'n particular, the seminar ill revie a method that uses a simple machine learning to learn and predict important environmental factors that impact the performance of heel-inertial odometry based localization. !hese predictions are sho n to be an effective manner for triggering motion constraints, such as zero velocity updates, (hen needed, to significantly reduce localization drift. !his concept is then extended for the coordination of a multi-agent robotic systems and multiple heuristics are explored for triggering motion constraints in a decentralized manner.(nde #e@n Atry 5668angeBc