TOPIC	Human-autonomy Interaction
ORGANIZERS	Student Leadership Council and Faculty of ACIT Institute and TECHLAV Center
AREA	Autonomous systems, cooperative path planning, nonlinear estimation, decentralized task assignment, and human-machine teaming
SPEAKER	Dr. Emily Doucette, Air Force Research Laboratory Munitions Directorate
DATE	Friday April 15, 2016
TIME	3-4 p.m. (EST)
VENUE	Fort IRC 410, North Carolina A&T State University, UTSA and SIPI will be joining through video-conferencing
FEES	No Charge

SYNOPSIS

The utilization of autonomous agents can support mission success in dynamic, uncertain, and contested environments by augmenting human operator capabilities. Specifically, cooperative autonomous systems can provide enhanced situational awareness, which can inform decision support for target engagement scenarios. To leverage the full capabilities of autonomous agents in dynamic and uncertain battlefields, a common framework to update situational awareness between all agents, both human and autonomous, is required. As such, the speaker will detail ongoing research at the Air Force Research Laboratory Munitions Directorate that supports this need for enhanced situational awareness across a heterogeneous team of agents in both centralized and decentralized command and control architectures.

Current methods for human-autonomy interaction are largely implemented through rigid schemes that transfer control between humans and autonomy. Therefore, a generalizable framework has been developed utilizing Bayesian estimation and decision theory that incorporates the concepts of risk and uncertainty in all agents in a human-autonomous system to yield a decision structure for heterogeneous teams, where a human supervisor is aided by a risk-based representation of the target state estimate. In addition, a human operator or commander may use haptic inputs to intuitively communicate real-time updates a heterogeneous team of agents. Such inputs may be fused by use of a sample based Bayesian filter, or particle filter, and may be used to enhance situational awareness even in an information poor environment.

ABOUT THE SPEAKER

Emily A. Doucette is a research engineer for the Air Force Research Laboratory in the Weapon Dynamics and Control Sciences Branch of the Munitions Directorate. She earned a Ph.D. in aerospace engineering from Auburn University and is a recipient of the SMART Scholarship. Her research interests include cooperative path planning, nonlinear estimation, decentralized task assignment, and human-machine teaming. She serves on the AFRL Munitions Directorate Autonomy Steering Committee, manages the directorate's efforts in the Privileged Sensing Framework OSD ARPI Project, and serves as co-PM for the NC A&T Autonomy COE.