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**Robert E. Karlsen
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Editors

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Introduction

The Unmanned Systems Technology XIV Conference consisted of eleven sessions that spanned three days and were devoted to current robotic technologies relevant to commercial and military applications. The opening session on Wednesday was Multi-Robot Control, which was a joint session with Defense Transformation and Net-Centric Systems 2012, Conference 8405. Increasing the number of robots that one person can efficiently control is of interest for both military and security applications. One paper described their team's entry in the joint U.S./Australia multi-robot competition, MAGIC 2010, while another paper discussed multi-robot pursuit and evasion in an indoor environment. The Navigation and Mobility I session included papers on the challenges of developing and testing autonomous ground platforms, both small and large, as well as research on control techniques to enable autonomous vehicles to drive fast. The Intelligent Behaviors session described a variety of techniques for enabling behaviors ranging from driver assistance to full autonomy, including work in approximate dynamic programming, trust and consensus, and vehicle-to-vehicle communication. The last session of the day was on developments in the area of Human Robot Interface, which included papers on dismounted leader follower, semi-autonomous control coordination, and different controllers and viewing devices.

The Thursday morning sessions were joint with Conference 8373, Micro- and Nanotechnology Sensors, Systems, and Applications IV, and consisted of work performed under the Army Research Laboratory's (ARL) MAST CTA. The papers described the development and manufacturing of micro flapping wing air vehicles, as well as research into micro cyclocopters and legged ground robots. Presentations were also made of micro inertial, hair, infrared, radar and gas sensors that will enable autonomous behaviors and other useful capabilities beyond navigation. The afternoon's Perception session described work in decentralized and appearance-based SLAM techniques, as well as some navigation methods for air platforms, including the fully self-contained landing of a micro-air vehicle. The final session consisted of papers from ARL's Robotics CTA, which described current research on manipulation and mobility, cognitive architectures, semantic perception, and shared mental models. Demonstrations of physical prototypes are always well received and we saw implementations of flying and crawling micro-robots, along with Big Dog throwing concrete blocks! Thursday concluded with a well-attended poster session and some more interesting papers in robotics.

Friday began with a session on Articulation and Manipulation, where a paper was presented on autonomous door opening, which is often neglected in urban autonomy scenarios. Other papers included work showing the advantages of stereovision for tele-operated manipulation, as well as research on haptic

controllers and immersive displays. The Navigation and Mobility II session described work in autonomously exploring multi-story buildings, as well as non-deterministic and energy conserving path-planning techniques. The final session of the conference was the Special Topics session, which included papers on diverse topics such as developing large autonomous military vehicles, a system for storing and deploying marsupial robots, communication latency and mesh networking, as well as the development of a throwable robot.

This year's conference contained a wide array of cutting-edge unmanned systems technologies and shows why robotics is such an exciting area. We hope you enjoy these proceedings and are able to attend our conference next year.

Robert E. Karlsen
Douglas W. Gage
Charles M. Shoemaker
Grant R. Gerhart