

**12th ICCRTS
“Adapting C2 to the 21st Century”**

**Commanding Unmanned Ground Vehicle Movement in Unfamiliar
Environments Using Unconstrained English:
Initial Research Results**

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ABSTRACT

Sensemaking in a command and control environment is critical not only for soldiers and commanders but also for autonomous equipment on the battlefield. Machine sensemaking in UGVs requires cognitive robotics, including the ability of software to map between human language and concepts, on the one hand, and robot perception and object recognition on the other hand. Advanced sensemaking in UGVs would allow soldiers to send autonomous equipment through unfamiliar urban environments using navigational commands such as “go to the second street, turn left and stop at the fourth building”.

Recent work by Haas and Shimizu has demonstrated the ability of a simulated robot to respond correctly to naively-produced navigational commands, expressed in unconstrained English, which direct robot movement in unfamiliar environments with over 80% accuracy in language understanding and navigation execution. Our current work extends this approach to natural language processing into a physical robot, introducing uncertainties of sensor perception, object recognition and language-to-environment mapping. We provide initial results that quantify accuracy at these levels for a simple indoor environment and identify potential metrics for scale-up to more complicated environments.

This abstract, the full paper and the research they describe are unclassified.

Suggested tracks:

Track 8: C2 Technologies and Systems

Track 6: C2 Metrics and Assessment

Track 4: Cognitive and Social Issues