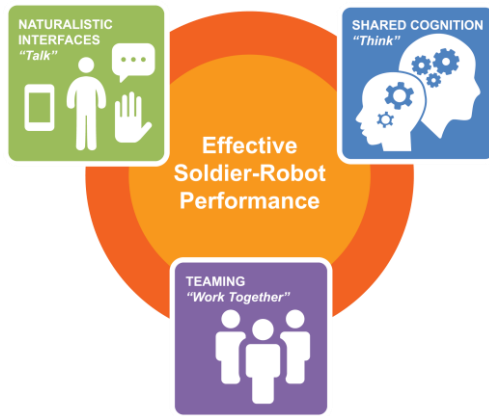


Multimodal Interface for Human Robot Interaction



With continuously increasing capabilities, future robots will have the intelligence necessary to move beyond their current role as tools. Effective Soldier-Robot performance requires shared cognition, teaming, and naturalistic interfaces. Working in highly dynamic and kinetic environments typical of military operations, it is critical that communications are natural and intuitive such that they are quickly and accurately understood. In collaboration with members of the Robotics Collaborative Technology Alliance (RCTA), the University of Central Florida (UCF) developed a prototype multimodal interface for dismounted human robot teaming, integrating auditory and visual modalities within a single device for command and control of a robot.

The Multimodal Interface (MMI) enables bi-directional communication with a robot teammate. Automated Speech Recognition (ASR) system in combination with Natural Language Understanding (NLU) software captures commands from a Soldier and translates them to a Tactical Behavior Specification (TBS) the robot can understand. Soldiers issue speech commands (e.g. screen the back of the building), with feedback received through auditory cues and an intuitive visual display. Using a gesture recognition glove, users can pause or resume tasks and manually reposition the robot (e.g. move forward). Through the combination of speech, gestures, and auditory feedback, a Soldier is able to command a robot to perform reconnaissance without having to look at a screen, minimizing head-down interactions. Although not required for issuing commands, the MMI visual display provides the robots status, current video feed, and location for cases when it leaves line of site of the squad. Additionally, the MMI includes dialog capabilities supporting robot assistance requests to resolve command ambiguity (e.g. which building did you mean?) and selection of alternative plans.

