Complementary Situational Awareness for Human-Robot Partnerships

Written by Nabil Simaan
Monday, 09 September 2013 15:54 - Last Updated Friday, 13 January 2017 20:54

Project Title: NRI Large: Collaborative Research: Complementary Situational Awareness for Human-Robot Partnerships

NSF award number: IIS-1327566

![Diagram of proposed framework for robot-human complementary situational awareness (CSA)]

Proposed framework for robot-human complimentary situational awareness (CSA)

This is a new 5-year collaborative project involving three collaborative teams at Vanderbilt, Carnegie Mellon, and Johns Hopkins University. The Principal investigators on this grant are Dr. Nabil Simaan (Vanderbilt), Dr. Howie Choset (CMU) and Dr. Russell H. Taylor (JHU).

The grant consists of three partner institutions contributing to laying the foundations to a new concept in robotics that we call *Complementary Situational Awareness*. Robots have been
primarily used to augment human skill during manipulation tasks (e.g. for surgical applications, telemanipulation in hazardous environments) and in some cases to augment sensory presence (e.g. by providing force feedback to surgeons in cases where forces are below humanly perceptible thresholds). In our new approach robots will augment the human user not only in manipulation but also in understanding of the task and in action planning and execution. The idea is that the robots in some cases can sense things beyond human perception and this information may be used by the robot controller to create a model of the environment shape and the interaction characteristics. This robot situational awareness is then used to augment user/surgeon skill and situational awareness for carrying out complex tasks.

More details about this research will be disseminated through our shared project website. Additional details are available on NSF website.

In the coming years we will be updating this page with a list of publications and excerpts of research progress. Please check this page again in the future.

Poster of the planned research was presented in 2013 NRI Awardee Conference. A copy of the PDF poster is available here.

**Publications**


