



LEARNING APPROACHES APPLIED TO HUMAN-ROBOT INTERACTION FOR SPACE MISSIONS

SEKOU REMY AND AYANNA M. HOWARD

*Human-Automation Systems (HumAnS) Lab
School of Electrical and Computer Engineering
Georgia Institute of Technology
Atlanta, GA, USA*

ABSTRACT—Advances in space science and technology have enabled humanity to reach a stage where we are able to send manned and unmanned vehicles to explore nearby planets. However, given key differences between terrestrial and space environments such as differences in atmospheric content and pressure, acceleration due to gravity among many others between our planet and those we wish to explore, it is not always easy or feasible to expect all mission related tasks to be accomplished by astronauts alone. The presence of robots that specialize in different tasks would greatly enhance our capabilities and enable better overall performance. In this paper we discuss a methodology for building a robotic system that can learn to perform tasks via interactive learning. This learning functionality extends the ability for a robot agent to operate with similar competence as their human teacher- whether astronaut, mission designer, or engineer. We provide details on our approach and give representative examples of applying the different methods in relevant task scenarios.

Key Words: Interactive Learning, Human Robot Collaboration, Machine Learning