On Predicting System Performance, Operator Workload, and Wait Times for Human-UV Teams

Jacob W. Crandall, M. L. Cummings, Michael A. Goodrich, and Curtis W. Nielsen

While many command and control applications currently require multiple human operators to control a single unmanned vehicle (UV), a common theme in the literature is the development of human-UV teams in which a single human operator manages multiple UVs. In such systems, the performance of each UV in the team depends on adequate and timely input from the human operator. Thus, the ability to predict whether the human operator has sufficient cognitive resources to provide such input to each UV in a team is a necessary technology. These predictions must be made in real-time since the missions performed by these teams (and the teams themselves) can change suddenly. In this paper, we will present a measurement technology that attempts to predict various components of the system, including operator workload, system wait times, and system performance. We analyze the ability of this measurement technology to accurately predict these system characteristics in a case study in which a single operator manages 3 Uvs using various interaction methodologies.