

12TH ICCRTS

“Adapting C2 to the 21st Century”

Title

Using Physiological Sensors to Understand, Measure and Adapt to Stressors
in the C2 Environment

Topics

C2 Metrics and Assessment, Cognitive and Social Issues, C2 Technologies and Systems

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Abstract

Stress and fatigue are issues that will always be present in command and control centers. Understanding how stress and fatigue affect decision making performance will provide essential information needed to design and evaluate advanced command and control (C2) systems and environments. With detailed knowledge of how physiological measurements relate to general performance, decision-making, and situational awareness, better systems for real-time use and training can be developed. In addition, the ability to objectively measure cognitive attributes, such as workload or situation awareness, would greatly enhance our ability to evaluate current and proposed command and control systems as well as design new systems that optimize cognitive attributes and capabilities.

Johns Hopkins University Applied Physics Laboratory (JHU/APL) is setting up a physiologic sensor suite to investigate the relationships between the physiological measures provided by the sensors and a warfighter's performance under various conditions of stress and fatigue. The sensors include an electroencephalogram (EEG), an electrocardiogram (ECG), a galvanic skin response sensor, mobile and stationary eye trackers, and software to combine and integrate the sensor outputs. This sensor suite will be integrated into a simulated C2 environment at JHU/APL. One goal will be the development of *objective* human performance measurement techniques using a physiological sensor suite to uncover the relationships between warfighter cognitive state, physiological measures, and warfighter performance. This work will build on previous research by the Augmented Cognition community and internal research completed by the first author investigating the relationship between fatigue and situation awareness.

This paper will provide a background into the area of Augmented Cognition, a description of the physiological suite that JHU/APL is installing, a description of past research into fatigue, and a discussion on future activities to be pursued.