NASA SBIR/STTR Technologies

Creating a closed loop task mitigation system

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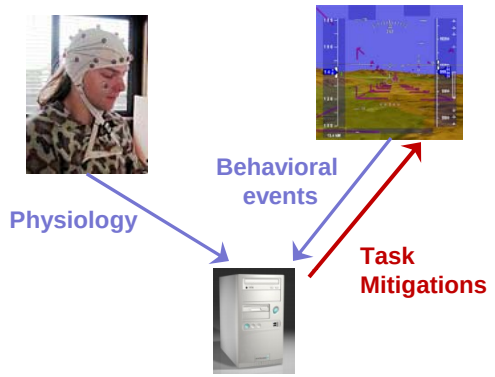
Identification and Significance of Innovation

Develop an adaptive task mitigation system that monitors operator functional state, identifies states that may lead to operational errors, and dynamically aids operators to optimize performance/minimize risk.
Innovations:

1) four-dimensional computational cognitive model of the operator's mission.
2) predictive algorithms trained by in time-varying cognitive models
3) task mitigation strategies that dynamically allocate tasks among multiple operators.

Expected TRL Range at the end of Contract (1-9): 3



Technical Objectives and Work Plan

The technical objectives that will be addressed are:

(a) Develop cognitive models of executive function, working memory, spatial working memory and attention within the task context
(b) Develop an advanced regression model to sync physiology and behavioral events to features of the cognitive models
(c) Identify task mitigation strategies that maintain the integrity of the tasks while dynamically assisting the operator

To achieve these goals, the following tasks are planned:

(a) Cognitive task analysis of relevant mission
(b) Develop computational cognitive models
(c) Develop and train regression algorithms
(d) Identify task mitigation strategies

NASA and Non-NASA Applications

NASA: Development of adaptive flight desk systems to increase operator safety and reduce errors due to fatigue, stress, and cognitive overload.
Non-NASA: Similar technology would be useful for controlling sophisticated equipment in both the military and civilian life. This system could also be an effective training aid to identify operators with particular skills, and focus training on skills that require consolidation.

Firm Contacts

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