

Fiscal Year:	FY 2013	Task Last Updated:	FY 02/05/2014
PI Name:	Duda, Kevin R Ph.D.		
Project Title:	Metrics and Methods for Real-Time Task Performance Assessment		
Division Name:	Human Research		
Program/Discipline:			
Program/Discipline--Element/Subdiscipline:	NSBRI--Human Factors and Performance Team		
Joint Agency Name:	TechPort:	No	
Human Research Program Elements:	(1) SHFH :Space Human Factors & Habitability (archival in 2017)		
Human Research Program Risks:	(1) BMed :Risk of Adverse Cognitive or Behavioral Conditions and Psychiatric Disorders (2) HSIA :Risk of Adverse Outcomes Due to Inadequate Human Systems Integration Architecture		
Space Biology Element:	None		
Space Biology Cross-Element Discipline:	None		
Space Biology Special Category:	None		
PI Email:	kduda@draper.com	Fax:	FY 617-258-2772
PI Organization Type:	NON-PROFIT	Phone:	617-258-4385
Organization Name:	The Charles Stark Draper Laboratory, Inc.		
PI Address 1:	555 Technology Sq		
PI Address 2:	MS 27		
PI Web Page:			
City:	Cambridge	State:	MA
Zip Code:	02139-3539	Congressional District:	7
Comments:			
Project Type:	GROUND	Solicitation / Funding Source:	2012 Crew Health NNJ12ZSA002N
Start Date:	07/01/2013	End Date:	06/30/2016
No. of Post Docs:	No. of PhD Degrees:		
No. of PhD Candidates:	No. of Master' Degrees:		
No. of Master's Candidates:	No. of Bachelor's Degrees:		
No. of Bachelor's Candidates:	Monitoring Center: NSBRI		
Contact Monitor:	Contact Phone:		
Contact Email:			
Flight Program:			
Flight Assignment:			
Key Personnel Changes/Previous PI:			
COI Name (Institution):	Robinson, Stephen (University of California, Davis)		
Grant/Contract No.:	NCC 9-58-HFP03401		
Performance Goal No.:			
Performance Goal Text:	<p>This proposal addresses the NSBRI Human Factors and Performance research area to “develop and validate methods to assess task performance in real-time, provide immediate feedback, and recommend appropriate changes in time to improve mission outcomes,” using “operationally relevant scenarios or tasks for the spaceflight environment” (p. NSBRI-4). Future human exploration missions designs will likely be of varying duration, and require the direct interaction with and/or teleoperation of onboard systems and equipment, to accomplish exploration, assembly, or maintenance tasks (Review of U.S. Human Spaceflight Plans Committee, October 2009). Quantifying human factors and performance issues during real-time interaction with spacecraft systems is critical for assessing the impact of current tasking on mission outcomes and performance. The proposed project has three specific aims to develop a set of objective metrics that can be quantified to assess task performance in real-time, and provide immediate feedback to the human using several operationally relevant scenarios for the spaceflight environment:</p>		

Task Description:	<p>1) Define the system architecture, integrate vehicle, system and environment models, and perform a critical analysis of the operationally relevant tasks to identify the specifics of candidate metrics for performance, workload, and situation awareness,</p> <p>2) Develop and integrate real-time performance analysis techniques with the vehicle/system models that can run in real-time and provide immediate feedback to the operator, and</p> <p>3) Conduct a series of simulations and experiments to baseline performance, workload, and situation awareness in each of the tasks.</p> <p>Vehicle, system, and environment models, as well as task-specific displays and controls will be available to the operator for the following selectable scenarios: a) piloted MPCV/Orion atmospheric entry, b) piloted MPCV/Orion rendezvous, proximity operation, and docking with the ISS, c) ISS EVA/SAFER operations, and d) piloted lunar landing. We intend to leverage extensively the performance assessment methods developed under NSBRI Project HFP02001 to quantify performance, workload, and situation awareness as temporal measures during complex system automation mode transitions (e.g., Hainley, 2011; Hainley, Duda, et. al, in review).</p>
Rationale for HRP Directed Research:	
Research Impact/Earth Benefits:	
Task Progress:	New project for FY2013.
Bibliography Type:	Description: (Last Updated: 09/04/2023)