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) **HARI**:Risk of Inadequate Design of Human and Automation/Robotic Integration		
Space Biology Element:	None		
Space Biology Cross-Element Discipline:	None		
Space Biology Special Category:	None		
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City:	Cambridge	**State:**	MA
Zip Code:	02139-3539	**Congressional District:**	7
Comments:			
Project Type:	GROUND	**Solicitation:**	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:			

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:
1) Define the system architecture, integrate vehicle, system and environment models, and perform a critical analysis of

Task Description:	the operationally relevant tasks to identify the specifics of candidate metrics for performance, workload, and situation awareness, 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 3) Conduct a series of simulations and experiments to baseline performance, workload, and situation awareness in each of the tasks. 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).
Rationale for HRP Directed Research:	
Research Impact/Earth Benefits:	0
Task Progress:	New project for FY2013.
Bibliography Type:	Description: (Last Updated: 04/05/2019)