Fiscal Year:	FY 2020	**Task Last Updated:**	FY 10/22/2020
PI Name:	McLaughlin, Anne Ph.D.		
Project Title:	Cognitive Aid Design Using Augmented Reality to Support Attention		
Division Name:	Human Research		
Program/Discipline:			
Program/Discipline--Element/Subdiscipline:			
Joint Agency Name:		**TechPort:**	Yes
Human Research Program Elements:	(1) **HFBP**:Human Factors & Behavioral Performance (IRP Rev H)		
Human Research Program Risks:	None		
Space Biology Element:	None		
Space Biology Cross-Element Discipline:	None		
Space Biology Special Category:	None		
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Zip Code:	27695-7650	**Congressional District:**	4
Comments:			
Project Type:	GROUND	**Solicitation / Funding Source:**	2019 HERO 80JSC019N0001-FLAGSHIP & OMNIBUS: Human Research Program Crew Health. Appendix A&B
Start Date:	08/20/2020	**End Date:**	08/19/2021
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:**	NASA JSC
Contact Monitor:	Williams, Thomas	**Contact Phone:**	281-483-8773
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Flight Program:			
Flight Assignment:			
Key Personnel Changes/Previous PI:			
COI Name (Institution):	Byrne, Vicky M.S. (KBR/NASA Johnson Space Center) Coleman, Maribeth Ph.D. (Georgia Tech Research Corporation)		
Grant/Contract No.:	80NSSC20K1715		
Performance Goal No.:			
Performance Goal Text:			

Task Description:	We propose to research and develop a cognitive aid to support performance of rare tasks, tasks that cannot be trained at length prior to flight, and any task that would be adversely affected by distraction or attention overload. Many of these tasks are complex, occur in cramped or filled environments, and require detection of patterns, incorporation of feedback into the next steps of the task, and high focus of attention. A preliminary list of these tasks across the 12 phases of an expedition to Mars can be found in the 2018 NASA final report by Stuster, Adolf, Byrne, and Greene. Some previously developed cognitive aids have incorporated augmented reality elements (such as the NASA supported IDEAS (Integrated Display and Environmental Awareness System) and NASA Sidekick)). Cognitive aids with augmented reality elements support attention by adding to the environment: this includes alarms, screen movement, highlighting, and other attention-capture methods. We focus our study and development of novel augmented reality incorporated into a cognitive aid: de-emphasis of auditory and visual clutter and distractions. The term for this type of aid is Diminished Reality (DR). This form of aid targets the cognitive processes most likely to be affected by long-term spaceflight: difficulty focusing, inhibiting distractors, and locating spatial information crucial to the task. DR displays and interaction techniques will be developed by Human–computer interaction (HCI) researchers and graduate students in human factors psychology. Prototypes will be tested with human subjects on the complex task of setting up novel medical equipment, an appropriately complex task listed in the 2018 Mars Expedition Task List. An advanced prototype will be user-tested by space-knowledgeable individuals at Johnson Space Center. Deliverables will include a prototype of the aid and generalized principles and guidelines for future incorporation of de-emphasis augmentations into cognitive aids. Stuster, J, Adolf J, Byrne V, Greene M. (2018). Human exploration of Mars: Preliminary lists of crew tasks. NASA/CR-2018-220043. https://
Rationale for HRP Directed Research:	
Research Impact/Earth Benefits:	
Task Progress:	New project for FY2020.
Bibliography Type:	Description: (Last Updated: 07/10/2023)