

Fiscal Year:	FY 2020	Task Last Updated:	FY 10/18/2020
PI Name:	Stankovic, Aleksandra Ph.D.		
Project Title:	Quantification of Response to Virtual Reality-based Sensory Stimulation for Relaxation and Therapeutic Release in ICE		
Division Name:	Human Research		
Program/Discipline:			
Program/Discipline-- Element/Subdiscipline:			
Joint Agency Name:		TechPort:	No
Human Research Program Elements:	(1) HFBP :Human Factors & Behavioral Performance (IRP Rev H)		
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		
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City:	Charlestown	State:	MA
Zip Code:	02129-2020	Congressional District:	7
Comments:			
Project Type:	GROUND	Solicitation / Funding Source:	2017-2018 HERO 80JSC017N0001-HHCHFBP: Human Health Countermeasures, Human Factors, Behavioral Performance. Appendix D
Start Date:	09/09/2020	End Date:	09/08/2023
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
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Flight Program:			
Flight Assignment:			
Key Personnel Changes/Previous PI:			
COI Name (Institution):	Endsley, Tristan Ph.D. (Charles Stark Draper Laboratory Inc) Duda, Kevin Ph.D. (Charles Stark Draper Laboratory Inc) Buckey, Jay M.D. (Dartmouth College) Bovard, Pooja Ph.D. (Charles Stark Draper Laboratory Inc)		
Grant/Contract No.:	80NSSC20K1852		
Performance Goal No.:			
Performance Goal Text:			

Task Description:	<p>The environmental conditions of prolonged spaceflight missions pose medical and psychological risks for astronauts. As identified by NASA Human Research Program (HRP), long duration exposure to an isolated, confined, and extreme (ICE) environment contributes to the risk of adverse cognitive or behavioral events which may compromise mission safety and success. Previous work has suggested a link between the reduced sensory stimulation associated with such environments and a loss of pleasure, satisfaction, and engagement ([1], [2], [3]). Effective countermeasures are necessary to promote individual behavioral health and performance by providing increased sensory stimulation, offering novelty, preventing boredom, reducing stress, and increasing attention. Draper Laboratory, in conjunction with collaborators at Dartmouth Geisel School of Medicine, will investigate Virtual Reality (VR) stimulation for relaxation and therapeutic release to mitigate the risk of adverse cognitive and behavioral effects in spaceflight-like isolated, confined environments.</p> <p>This study will expand upon previous work conducted by our Dartmouth collaborators which investigated the feasibility of nature-based sensory stimulation using VR to promote stress management and relaxation ([4]) by (1) adding an interactive component to the VR-based sensory stimulation, to promote engagement and to facilitate therapeutic release; (2) deploying and testing this platform in ICE for feasibility and validation; (3) incorporating non-intrusive physiological monitoring; and (4) examining quantifiable neurophysiological response to stimulation exposure, individual variability in responses, and longitudinal and dose-response characteristics of exposure impacts.</p> <p>References:</p> <p>[1] Kanas N, Sandal G, Boyd JE, Gushin VI, Manzey D, North R, (...), Inoue N. (2009). Psychology and culture during long-duration space missions. <i>Acta Astronautica</i>, 64(7-8), 659-77.</p> <p>[2] Stuster J. (2011). <i>Bold endeavors: Lessons from polar and space exploration</i>. Naval Institute Press.</p> <p>[3] Holland AW. (2000). Psychology of spaceflight. <i>Journal of Human Performance in Extreme Environments</i>, 5(1), 4-20.</p> <p>[4] Brasher KS, Dew AB, Kilminster SG, Bridger RS. (2010). Occupational stress in submariners: the impact of isolated and confined work on psychological well-being. <i>Ergonomics</i>, 53(3), 305-313.</p>
Rationale for HRP Directed Research:	
Research Impact/Earth Benefits:	
Task Progress:	New project for FY2020.
Bibliography Type:	Description: (Last Updated: 03/22/2024)