Piname: Sinding. Leia Ph.D. Project Title: KCAAM VNS COR. Response Multimodal Human-Automation Communication for Augmenting Human Siluation Project Title: Human Research Project Title: Human Research Program/Dicipline:	Fiscal Year:	FY 2019	Task Last Updated:	FY 04/22/2019
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Space Biology Element: None Space Biology Special Category: None Space Biology Special Category: None PI Canality Jeins/Gumich.edu Fax: PI Canality Jeins/Gumich.edu Fax: FY PI Organization Type: UNIVERSITY Phone: 617-324-7410 Organization Name: University of Michigan Intersity of Michigan Intersity of Michigan PI Address 1: Industrial and Operations Engineering Intersity of Michigan Intersity of Michigan PI Address 2: 1030 EB Al Arenue, G634 IOE Building Intersity of Michigan Intersity of Michigan PI Address 1: Ann Arbor Stat: MI City: Ann Arbor Stat: MI City: Ann Arbor Stat: MI Comments: NOTE: PI moved to University of Michigan in fall 2019; provious atfiliation was Massenbasetts Institute of Technology Project Type: GROUND Solicitation / Punding Topics in Biological, Playslogical, and Source' Solicitation / Punding Contact Mone: No. of Master' Degrees: No. of Master' Degrees: No. of Post Does: No. of Master' Degrees: No	Human Research Program Elements:	(1) HFBP:Human Factors & Beha	vioral Performance (IRP Rev H)	
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Interaction Material UNIVESE UNIVESE UNIVESE PI Organization Name: UNIVESITY Phone 617-324-7410 Organization Name: University of Michigan Industrial and Operations Engineering Industrial and Operations Engineering PI Address 1: Industrial and Operations Engineering Industrial and Operations Engineering Industrial and Operations Engineering PI Meb Page: Industrial and Operations Engineering Industrial and Operations Engineering Industrial and Operations Engineering City: Ann Arbor State: MI Zip Code: Van Arbor State: MI Comments: NOTE: PI moved to University of Michigan in full 2019; previous affiliation was Masschusetts Institute of Technology Project Type: GROUND Solicitation / Funding Solicitation / Funding Solicitation / Funding Solicitation / Source: 2017-2018 HERO 800SO17N0001-BPBA Topics in Biological, Physiological, Anged Solicitation / Source: Solicitation / Source: GROUND Solicitation / Funding Solicitation / Funding Solicitation / Source: 2017-2018 HERO 800SO17N0001-BPBA Topics in Biological, Physiological, Anged Solicitation / Source: Sol of BD Candidates: No. of Master' Degrees: 1231/2019 No. of Bachelor's Candidates:	Space Biology Special Category:	None		
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Task Description:	This task is part of the Human Capabilities Assessments for Autonomous Missions (HCAAM) Virtual NASA Specialized Center of Research (VNSCOR). The objective of this research is to provide recommendations for augmenting human situation awareness (SA) and task performance through multimodal displays and communication pathways based on empirical evidence. Specifically, we will evaluate the effectiveness of several multimodal Virtual Reality (VR) techniques in providing spatial and temporal SA to a human operator controlling multiple semi-autonomous agents. Our testbed will simulate a Long-Duration Exploration Mission (LDEM) inspection task using the ground-based Massachusetts Institute of Technology (MIT) Synchronized Position Hold, Engage, Reorient, Experimental Satellites (SPHERES) platform enhanced with NASA Jet Propulsion Laboratory (NASA-JPL) automatic scene reconstruction capability. A human study will be conducted with the human supervisor providing commands to the SPHERES using images rendered in a virtual environment. The results of this project will provide empirical evidence for revising portions of NASA-STD-3001 and the NASA Human Integration Design Handbook (HIDH) that guide interface design for effective SA and task performance. There is a need to expand current guidance on responsive displays, especially when integrated with VR technologies, to enable SA for relevant operational tasks. The proposed project will integrate current NASA-JPL technology within a small robotic satellite testbed to examine the bi-directional communication between the human-robot team to enable improved SA. We propose the following specific aims: (1) Integrate and extend existing capabilities at JPL and MIT into a testbed for examining information communication between human-autonomy teams and (2) Evaluate SA, trust, and task performance within a ground-based study with selected communication modalities and information displays.
Rationale for HRP Directed Research	:
Research Impact/Earth Benefits:	
Task Progress:	New project for FY2019.
Bibliography Type:	Description: (Last Updated: 11/09/2023)