| Fiscal Year: | FY 2021 | Task Last Updated: | FY 04/16/2021 |
|--|--|-----------------------------------|---|
| PI Name: | Du, Jing Ph.D. | | |
| Project Title: | Sensory Manipulation as a Countermeasur | re to Robot Teleoperation Dela | ys |
| Division Name: | Human Research | | |
| Program/Discipline: | | | |
| Program/Discipline Element/Subdiscipline: | | | |
| Joint Agency Name: | | TechPort: | Yes |
| Human Research Program Elements: | (1) HFBP:Human Factors & Behavioral P | 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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| PI Organization Type: | UNIVERSITY | Phone: | 352-294-6619 |
| Organization Name: | University of Florida, Gainesville | | |
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| City: | Gainesville | State: | FL |
| Zip Code: | 32611-1934 | Congressional District: | 3 |
| Comments: | | | |
| Project Type: | Ground | Solicitation / Funding Source: | 2020 HERO 80JSC019N0001-HFBP, OMNIBUS3 Crew Health: Human Factors and Behavioral Performance-Appendix E; Omnibus3-Appendix F |
| Start Date: | 04/02/2021 | End Date: | 04/01/2022 |
| 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: | Whitmire, Alexandra | Contact Phone: | |
| Contact Email: | alexandra.m.whitmire@nasa.gov | | |
| Flight Program: | | | |
| Flight Assignment: | | | |
| Key Personnel Changes/Previous PI: | | | |
| COI Name (Institution): | Oweiss, Karim Ph.D. (University of Flor | ida, Gainesville) | |
| Grant/Contract No.: | 80NSSC21K0845 | | |
| Performance Goal No.: | | | |
| Performance Goal Text: | | | |
| | | | |

| Task Description: | Currently, most interactions with robots in space exploration are achieved through teleoperations. During future space teleoperations, communicating time delays associated with long distances may negatively affect performance if operators on to calibrate to it. The goal of this research is to set if sensory manipulation, especially providing virtual force cues via haptic device-generated feelings of touch and resistance (paired with delayed visual cues), can help mitgate the negative influence of teleoperation delays measured by perceived presence, neural efficiency, and task performance. This research aims to test the following hypothesis: Modifying haptic sensation alleviates the subjective perception of time delays and expedites operator's adaptation to stochastic delays in robot teleoperations. Human sensorimotor controls rely on multimodal sensory feedback, such as the visual, auditory, and taxle cues, to make sense of the operators modul as ensory feedback, such as the visual, auditory, and taxle sensory manipulation, i.e., providing additional sensory modalities as reinforcement cues, can modulate the effectiveness of motor learning and eherator end, the delayed visual cues of teleoperation are reinforced by multimodal sensory feedback, mitigating the perception of time delays and improving performance. |
|--|---|
| Rationale for HRP Directed Research: | |
| Research Impact/Earth Benefits: | |
| Task Progress: | New project for FY2021. |
| Bibliography Type: | Description: (Last Updated: 04/20/2023) |