Minority University Research and Education Project (MUREP)

Institution: California State University-Fresno

City/State: Fresno, CA

Award Name: MUREP Partnership Learning Annual Notification (MPLAN)

Award Number: N/A

Title: Human-Centric Digital Twins in NASA Space Missions/ STRG-4: Excavation and Construction

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Summary:

The scientific discovery of the digital twin has exponentially grown recently, extending to various NASA space missions. Understanding the human-digital twin interaction emerges as a critical element in harnessing the technology's full capabilities within NASA's space missions, as it can reduce human errors in highly automated and mission-critical environments, enable real-time monitoring and diagnostics, and optimize resource allocation for space tasks. The primary goal of this interdisciplinary collaborative project is to contribute to NASA's space missions and commercial market developments through an investigation of the digital twin framework from the novel perspective of astronauts-digital twin interaction. To achieve this goal, the team will perform a comprehensive review of digital twin applications across various fields and explore the applicability of these digital twin practices in solving NASA's space missions. In addition, the team will develop and assess an XR-enabled digital twin prototype to facilitate astronauts' interaction with digital twins, emphasizing real-time operation status understanding, task planning efficiency, and operational risk reduction.