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ASTRONAUT ETHNOGRAPHY: A DESIGN RESEARCH APPROACH TO MICROGRAVITY

Abstract

The microgravity environment presents unique challenges for designers, engineers, and architects. Humans on Earth designing for life off-planet lack the intuition related to altered perception, coordination, and sensations that astronauts are intimately familiar with, as well as the implications of the build environment in which they work. Additionally, given the hazards associated with the environment, design for space often prioritizes mission-related safety and efficiency over more human-centric considerations. However, the increased access to and democratization of space presents the opportunity to change the way we approach designing for it, especially if human needs and insights can be effectively captured and incorporated. Human-centered design in general, and design research in particular, are well-suited for learning about the experiences and environmental interactions, both social and technical, of the small population of astronauts alive today. This paper outlines a research plan to conduct contextual and tactical design research with astronauts and other industry professionals with a unique, experiential knowledge of space environments and architectures. Leveraging ethnography, grounded theory, and participatory design as research methodologies, we describe lessons learned from a series of interviews we conducted with astronauts. With the goal of informing future research and designs, we catalog our interview protocols and research approach to the context and culture of those living in space.