

IAF HUMAN SPACEFLIGHT SYMPOSIUM (B3)
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MULTISENSORY GARMENTS FOR OPTIMAL BODY-MIND AWARENESS IN SPACE TRAVEL

Abstract

Achieving high levels of emotional and physical performance requires multisensory input. Space travel dulls sensory systems and could value from physiological support. As it is an extreme environment, sensory enhancement could also support psychological structures. Current technologies primarily address visual, sound cues, and some haptics but exclude other inputs like touch, smell, and taste and peripheral enhancement systems. We propose to create multisensory, multimodal wearable interfaces to heighten awareness of body and mind and assist in achieving the flow state, the optimal state for mental clarity and group cohesion during space travel.

To evoke the flow state, we propose a cohesive system – a network that creates an Internet of the Body – a wearable sensor platform with affective technology to stimulate self-management and wellbeing in a tangible format of a garment. First, a multi-sensor device monitors physiological data to track arousal, respiratory behavior, and motion. Then, it translates the biodata to visual, auditory, and tactile displays embedded in the garments. This multisensory body interface offers real-time biofeedback to the wearer and acts as a tele-display to communicate with others in proximity. The feedback also creates a feedback loop for the wearer to gain insight as it gives the body a voice, with non-verbal communication. Finally, remote communication makes it possible to send feelings from a distance – from one to the other – to even simulate the energy of human touch. This is the system of extimacy, showing how one feels on the inside to the external world. This act of displacing emotional states to an outside tangible object is also a disassociation tool for mental wellbeing and the access point to flow states.

This multimodal sensory enhancement leads to new possibilities of optimal integration of experience in extreme situations like space travel. Our goal is to provide support for the flow state by enhancing awareness, self management, and communication of wellbeing for future space explorations.