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REFERENCE EARTH: A BIOPHILIC INTERVENTION IN SPACE

Abstract

Keywords: human centered design, biophilia, reference Earth, material semantics, sensory perception, second order cybernetics, boundary objects, vitruvian delights.

Life on Earth evolves through circular interactions between all terrestrial life forms and nature. When leaving this protective environment for space, we have to mitigate temperature extremes, vacuum, high radiation, reduced gravity, as well as the personal physiological and psychological impacts on the astronauts. On today's short-duration space missions these are addressed on Maslow's basic-needs level, primarily through technological solutions. We believe that long-duration space habitats must also address higher-level crew needs, related to comfort and wellbeing. This is where human centered designers and artist can contribute greatly by facilitating conversations and designing mockups, prototypes and other boundary objects. In this paper we are proposing a recluse, a dedicated personal compartment for astronauts on a notional long-duration mission, designed with curated affordances around multi-sensorial parameters. Our goal is to cater to the astronaut's desire for privacy, wellbeing and physical rejuvenation at a sensorial level, with a proposed outcome designed around the limited space habitat volume. This dedicated personal recluse exploits the phenomena of material semantics, which is the associated symbolic and emotional information of a material, to create zones highlighted with temporal and spatial functions. Through the circularity of second-order cybernetics (SOC), we explore the meaning of personal space or recluse on a metaphysical level, and how we differentiate it from shared communal zones. The driving method of this design is biophilia, where we explore how the Earth, as a reference environment, shapes and influences our embodied sensorial apparatus, and how this could be translated to a protective environment inside a space habitat. Humans are terrestrial beings, all our embodied reactions were formed and conditioned for this context, namely that of Earth. The limbic brain, which is responsible for stress reduction and reaction, works primarily on the information obtained from the sensory apparatus of the crew's physical body. Our proposed recluse for the crew inside a long-duration habitat works reversed on this phenomena. That is, we focus on the feedback information loop from this personal space to the astronaut on a multi-sensorial level. Based on the synthesis of workshop-based exercises we assess and evidence how olfactory encounters, curated soundscapes, complimentary light design, and hapticity-influences can be composed together to create an atmosphere of relaxation and vitruvian delight.