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Integrating Human Factors into the Colour Design of Human-Machine Interfaces for Spatial Habitat

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With the rapid advances in manned spaceflight technology, astronauts will stay in spatial habitat for a long time in the future, and spatial missions will be more diversified, which will place higher requirements on human-machine spacecraft systems. As an important visual element for interacting with astronauts, human-machine interfaces not only affect the astronauts' physical, psychological and cognitive activities, but also their work efficiency and even the safety of the space mission. This study system investigated publications, videos and pictures from NASA, ESA, China Space Center and Roscosmos. It was found that colour elements play an important role in the life and work of astronauts and profoundly affect the habitability level of the space environment. At the same time, it was found that human physiological parameters, cognitive and decision-making abilities, human psychological factors are the main abilities affected by colour elements. Through sketching as well as 3D modelling and rendering, the relevant cabin interfaces of the future spatial habitat's areas for work, hygiene were designed. This study provides some enlightenment for future research on the colour design of spacecraft environments or lunar or Mars habitat environments.