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ON THE GENERATIVE METHODS OF SPACE SETTLEMENTS

Abstract

Graph Theory is a discrete mathematics branch focusing on the study of the relationship of pairwise relations of certain elements. Graphs represent an important computational data structure used as a layout representation of habitational spaces. Architectural layout design has also been influenced in recent times by generative computational methods, both mathematical and deep learning-based. However, past work has concentrated on non-extraterrestrial applications. This study compares the use cases of different graph generation algorithms, presenting a VGAE (Variational Graph Autoencoder) deep learning model proposal for space settlement design and generation based on the physiological needs of a 6-man human crew for long-term stays.