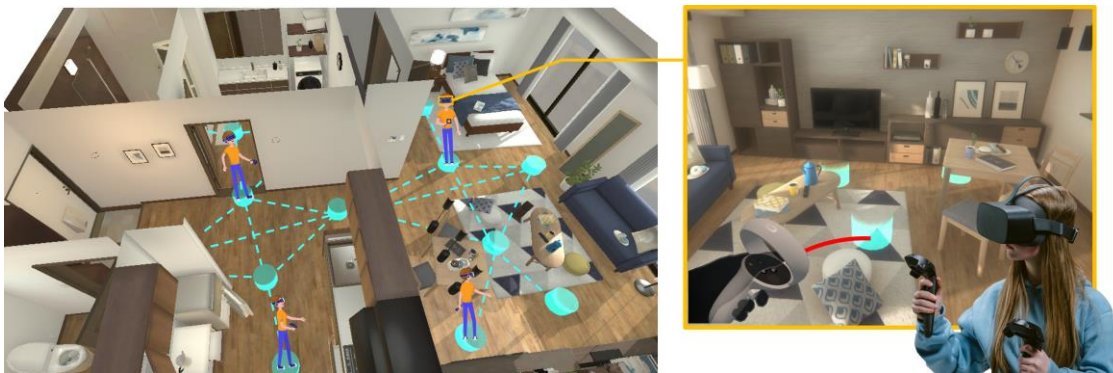## Navigation in Virtual Reality Spaces via Scene-Aware Teleportation

Scene-aware teleportation gives virtual reality (VR) users a significantly smoother navigation experience in virtual environments. The technique improves the navigation through teleportation by determining the most suitable teleport positions for the user. Particularly, the system uses proprietary algorithms to determine (and suggest to the user) the optimal virtual space positions from which the VR user would experience the most suitable scene perceptions (e.g. best panoramic view) of a certain observation space or object. This invention may be used in a wide range of applications, such as gaming, virtual touring, and VR assisted navigation of hazardous and military environments.

Locomotion is a fundamental task in virtual reality (VR). With the recent popularity of consumer-grade VR devices and the increasing availability of high fidelity virtual environments. Effective locomotion is crucial in navigating immersive virtual environments. Teleportation is particularly useful in navigating large virtual environments. Users often navigate to certain positions in the VR space in order to observe a particular scene or object. However, while current VR navigation systems provide users the option to teleport at various positions in the VR space, it is often difficult for the users to find the teleportation positions providing the best view of the scene or object.

This technology analyzes panoramic views at candidate teleport positions by extracting scene perception graphs. The graphs encode scene perception relationships between the observer and the surrounding objects, and presents the user with potential teleport positions in the VR space providing the best views of the scenes of interest. In VR games involving large space environments players use teleportation to navigate the space while the technique herein provides them desirable teleportation positions so that the player can play the games more efficiently. In virtual touring applications, this method can suggest to the user visually desirable positions from where a certain landmark is best observed (e.g. building, bridge, mountain) thereby enhancing the virtual tour experience