

A Review Of Recent Advancements in Immersive Telepresence

Abstract

Immersive telepresence is redefining remote connections by combining physical and virtual worlds. Unlike traditional video conferencing, it allows individuals to interact with remote environments in such a way that they feel physically present, although they are not. This research evaluates how this transformative technology improved remote collaboration by analyzing key innovations. Moreover, it also explores the impact of this technology across various domains such as healthcare, education, industrial operations, tourism and exploration. The study investigates the research conducted in the past decade, focusing on the publications of reputable Journal and Conference proceedings only. The research shows that interactive telepresence has significantly improved immersion, interaction, perception and communication with the virtual world. Core advancements such as digital agents have significantly improved personalized learning and real-time interactions. To enhance realism, 3D rendering and sensory feedback provides highly realistic virtual environments with improved responsiveness for better user engagement. Low latency between the physical and virtual world is essential for seamless and real-time interaction, which has become possible due to recent advancements in communication. The potential of these improvements has reshaped multiple industries as well. In healthcare, remote surgical treatments have become more effective with real-time response. Interactive learning experiences have significantly increased academic outcomes. Virtual inspection and dynamic feedback accelerated safety and precision in industrial operations. By enhancing remote experience, this study also identifies key challenges and proposes future directions for better virtual experience.