**MIXED REALITY**

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**Key words:** MR (mixed reality), immersive encounters, seamless integration, user interaction, visualization.

**Introduction:** MR, an abbreviation for Mixed Reality, signifies a revolutionary amalgamation of the digital and material domains, where the lines separating reality and virtuality become indistinct, giving rise to engaging interactions. Unlike its counterparts, Augmented Reality and Virtual Reality, MR fluidly combines digital and hands-on components, opening up new horizons for interaction and exploration (Sharer, 2023). This compelling technology grants users the ability to manipulate and deal with virtual stuff amidst their actual environments, presenting a multitude of applications spanning various industries. From transforming amusement and gaming to enhancing design, healthcare, and educational opportunities, MR has the potential to reshape our daily lives.

**Objectives.** Firstly, MR aims to design immersive spaces in which physical and digitally generated elements smoothly coexist and permit consumers to engage with both in a natural way. Secondly, it strives to facilitate distant cooperation by permitting users to obtain in touch with each other and materials in digital form as though they were there in person, improving interpersonal interaction and collaboration. Lastly, MR can be used for displaying complicated data and simulations for practice, making it valuable for fields like tuition, medical care and engineering.

**Methods.** Creating MR involves a blend of hardware and software methods designed to merge the physical and unreal realms without interruption. Hardware components are crucial, featuring headsets with a suite of sensing devices such as cameras and sensors, which track individual’s movements and position to guarantee precise placement of fictional objects in the user's line of sight. These devices also perform mapping, generating a 3D map of the individual's environment, enabling the system to comprehend and engage with the real space (Ullah, 2023). Gesture and voice recognition technologies facilitate natural interactions, allowing users to control and manipulate fictional objects with movements and voice commands. Complex computer vision algorithms are employed to recognize and track physical items and surfaces, anchoring digitally generated content in the real domain. Specialized holographic displays, like waveguide displays, project digital content into the user's field of view, creating a convincing sense of immersion. Developers use software development platforms to create MR applications that leverage the hardware's capabilities. Some MR systems incorporate object identification and tracking, permitting certain physical objects to be interacted with by virtual content. Cloud computing works for remote processing and collaborative MR environments, where multiple users can interact in shared MR spaces, whether they are in the same physical location or geographically distributed (BasuMallik, 2022). These methods collectively enable the seamless hybridization of the digital and physical worlds, opening the door to an abundance of applications across a range of industries.

**Results.** Mixed Reality has ushered in an era of encounters that are engaging and absorbing. Its results are profound and transformative. Participants can seamlessly blend virtual content with their surroundings, improving their capacity to visualize, learn, and collaborate. MR has opened up an ocean of opportunities in gaming, where consumers can interact with captivating digitally generated components in their actual setting, and in tuition, where complicated ideas can be visualized and understood in 3D. In health sector, MR facilitates training, offering a secure and realistic environment for practice. Moreover, MR supports industrial applications, from style and construction to remote collaboration, streamlining processes, and improving productivity (Wigmore, 2018).

**Conclusion.** To sum up, Mixed Reality embodies a crucial merging of illusive and existing domains. Its extraordinary ability to meld the touchable and unreal domains has far-reaching implications for a variety of sectors and industries. As technology shifts further, we can anticipate increasingly inventive applications and enhanced user experiences, ultimately shaping how we engage with each other and our environment. Whether it's for gaming, learning, working, or creating, Mixed Reality has proven to be a vibrant and absorbing platform that has the potential to reconceptualize interaction's future between computers and users and transform our world in manners that were once only dreamed of.

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