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(57) Abstract :
Metaverse-Based Virtual Laboratory Environment for Technical Education ABSTRACT: Online education has gained significant popularity, particularly during the COVID-19 epidemic, when several remote synchronous software platforms were predominantly utilised worldwide. Nonetheless, these platforms are incapable of emulating the physical classroom or training room environments and fail to offer hands-on assistance for laboratories or corporate development centers. The Metaverse has recently emerged as a valuable platform for diverse applications. The Metaverse has garnered the interest of the academic community for some time and can be effectively employed in education and training. Digital Twins (DT) can facilitate the integration of concepts from the natural and physical world into Metaverse-based education, enhancing realism and user-friendliness in the learning experience. To the author's knowledge, there is no existing work or literature review that has examined the application of the metaverse for training or skill development of industry professionals and academics in a comprehensive manner within an integrated setting. Initially, we define the metaverse and demonstrate its potential to enhance educational assessment through the lenses of virtual reality, augmented reality, and blockchain technology. Subsequently, we delineate the metaverse exploration architecture and encapsulate its technological benefits. We suggest a metaverse-based implementation strategy to resolve the challenges of dependability, precision, and credibility in educational assessment. Ultimately, we present the challenges of implementation, performance assessment, and prospective research directions. This proposed method introduces novel research avenues for the reform of educational assessment while enhancing the potential and scope of metaverse applications in education.

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