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Exploring the Role of Digital Twins in Revolutionizing Healthcare: Opportunities and Challenges

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Abstract: *The emergence of Digital Twin (DT) technology has garnered significant attention in healthcare, providing a revolutionary approach to patient care, diagnostics, and treatment planning. Digital twins are virtual replicas of physical entities (in this case, human beings), created through the integration of real-time data collected from sensors and devices. This paper explores the potential role of Digital Twin technology in healthcare, its applications, challenges, and opportunities. We review recent studies and current implementations, focusing on the integration of digital twins for personalized care, predictive analytics, and decision-making. The research also highlights the barriers such as data privacy concerns, high implementation costs, and technological limitations. The findings point to a future where Digital Twin technology plays a central role in improving patient outcomes, operational efficiency, and the accuracy of treatments in healthcare. The paper concludes with a discussion of future research directions and applications for digital twins in healthcare.*

The purpose of this research study is to examine how digital twins can transform healthcare by going over the prospects, difficulties, and future course of their integration into healthcare systems. This study looks at the existing situation in an effort to offer insightful information about how digital twins can transform healthcare delivery and enhance patient care, while also identifying the challenges that need to be addressed for their widespread adoption.

Keywords: Digital Twin, Healthcare, Virtual Patients, Healthcare Innovation, Precision Medicine

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