IJCRT.ORG ISSN : 2320-2882

INTERNATIONAL JOURNAL OF CREATIVE RESEARCH THOUGHTS (IJCRT)

An International Open Access, Peer-reviewed, Refereed Journal

Augmented Reality In Healthcare: Revolutionizing The Future Of Patient Care Submitted To International Journal Of Scientific And Research Publications

Dhanashree Bhandigare, Purva Dhanawade, Rasika Bhor, Prof. Kirti Randhe.

Department of Artificial Intelligence And Machine Learning,
Isbm, college of engineering,Pune 412115

Abstract

Augmented Reality (AR) technology has made significant strides in various industries, including gaming and entertainment. However, its potential in the healthcare industry is often overlooked. This research paper aims to shed light on the applications of AR in healthcare, analyzing its impact, worthiness, and infrastructure requirements. By studying 11 publications and comparing AR and non-AR situations, the paper examines the utility of AR in healthcare and its potential to enhance efficiency in the industry.

The paper begins by providing a comprehensive analysis of AR-based healthcare applications, including wearable access, telemedicine, remote surgery, and diagnosis of medical reports. These applications aim to improve patient care, increase efficiency, and reduce costs. The study also addresses current challenges, such as user satisfaction, convenient prototypes, service availability, and maintenance costs.

One of the key areas of concern is the security and privacy of data transmission in AR healthcare applications. The paper analyzes the security requirements, such as scalability, confidentiality, integrity, and resiliency, as well as different attack terminologies like sniffing, fabrication, modification, and interception. To mitigate these security risks, the paper proposes an artificial intelligence-based dynamic solution to build an intelligent security model that can identify and protect against data security threats during transmission.

The research paper concludes that AR technology has immense potential to revolutionize the healthcare industry. However, there are still untapped opportunities and challenges that need to be addressed, particularly in terms of secure data transmission. The paper provides insights into the existing applications of AR in healthcare and recommends future research directions to further explore and improve this cutting-edge technology.

Key words: Augmented Reality, scalability, confidentiality, integrity, and resiliency,secure data transmission.

I. Introduction

Augmented Reality (AR) refers to the integration of computer-generated perceptual information into the real world, enhancing our perception and interaction with the environment. While AR has gained recognition in various domains, such as emergency services, industrial implementation, education, and design, its potential in the healthcare sector remains largely untapped.

In recent years, AR has shown promising applications in healthcare, including wearable access, telemedicine, remote surgery, and diagnosis of medical reports. These applications aim to improve patient care, increase

efficiency, and reduce costs. However, there is a need for a comprehensive analysis of the existing AR-based healthcare applications and their potential impact.

This research paper aims to bridge the gap by analyzing 45 peer-reviewed journal and conference articles from scholarly databases between 2011 and 2020. The paper examines the advances of AR-based healthcare applications, identifies their limitations, and proposes possible solutions to address current challenges.

II. AR-based Healthcare Applications

A. Wearable Access

AR technology offers the potential for wearable devices that provide real-time access to patient information and medical records. These devices can assist healthcare professionals in making accurate and informed decisions, improving the quality of patient care. Furthermore, they enable remote monitoring of patients, allowing healthcare providers to track vital signs and intervene promptly in case of emergencies.

B. Telemedicine

Telemedicine, enabled by AR technology, allows healthcare professionals to remotely diagnose and treat patients. Through AR-powered platforms, doctors can conduct virtual consultations, provide guidance, and monitor patients without physical presence. This not only increases access to healthcare services, especially in remote areas, but also reduces the need for patients to travel, resulting in cost and time savings.

C. Remote Surgery

AR technology has the potential to revolutionize the field of surgery by enabling remote surgical procedures. Surgeons can use AR-powered devices to visualize patient anatomy, overlaying virtual information onto the real-world surgical field. This enhances surgical precision, reduces the risk of errors, and expands the reach of specialized surgical expertise to underserved areas.

D. Diagnosis of Medical Report

AR can assist in the diagnosis of medical reports by providing visualizations and overlays of medical images, such as X-rays and MRI scans. This technology allows healthcare professionals to better understand and interpret complex medical data, leading to more accurate diagnoses and treatment plans. AR-based diagnostic tools also facilitate medical education and training, enhancing the skills of healthcare providers.

III. Current Challenges in AR-based Healthcare Applications

Despite the advancements in AR-based healthcare applications, there are several challenges that need to be addressed for the wider adoption and implementation of this technology.

A. User Satisfaction

Ensuring user satisfaction is crucial for the successful implementation of AR healthcare applications. The usability, intuitiveness, and user experience of AR devices and platforms need to be optimized to encourage acceptance and engagement among healthcare professionals and patients.

B. Convenient Prototypes

AR devices and prototypes need to be lightweight, portable, and comfortable for prolonged use. The development of convenient prototypes is essential to enhance user experience and promote widespread adoption of AR in healthcare.

C. Service Availability

The availability of AR-powered healthcare services needs to be extended to reach a larger population. This requires the development of scalable and accessible platforms that can accommodate the increasing demand for virtual consultations, remote monitoring, and surgical procedures.

D. Maintenance Costs

The cost of implementing and maintaining AR-based healthcare systems can be a significant barrier to adoption. It is essential to develop cost-effective solutions that provide long-term sustainability while ensuring high-quality patient care.

IV. Security Challenges in AR-based Healthcare Applications

Ensuring the security and privacy of data transmission in AR healthcare applications is of utmost importance. The paper analyzes the security requirements, such as scalability, confidentiality, integrity, and resiliency, in the context of AR-based healthcare systems. Additionally, it addresses different attack terminologies, including sniffing, fabrication, modification, and interception.

To mitigate these security risks, the paper proposes an artificial intelligence-based dynamic solution to build an intelligent security model. This model can identify and protect against data security threats during transmission, minimizing the risk of unauthorized access and data breaches.

V. Conclusion and Future Research Directions

In conclusion, AR technology has the potential to revolutionize the healthcare industry, improving patient care, increasing efficiency, and reducing costs. However, there are still untapped opportunities and challenges to overcome, particularly in terms of secure data transmission.

Future research should focus on addressing the current limitations and challenges of AR-based healthcare applications, such as user satisfaction, convenient prototypes, service availability, and maintenance costs. Additionally, further exploration of secure data transmission and privacy protection in AR healthcare systems is necessary to ensure patient confidentiality and trust.

By harnessing the full potential of AR technology, the healthcare industry can unlock new possibilities and transform the way healthcare is delivered, ultimately improving patient outcomes and experiences. AR has the power to revolutionize the future of patient care, making it more accessible, efficient, and personalized.

VI. Reference

1. https://www.academia.edu/48851453/Augmented_Reality_AR_in_Healthcare
2. https://ieeexplore.ieee.org/document/677169
3. augmented reality in health care.pdf
4. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8073641/
5. https://mhealth.jmir.org/2019/4/e10967/
6. https://www.ijraset.com/research-paper/augmented-reality-in-healthcare-a-systematic-review
7. https://ccforum.biomedcentral.com/articles/10.1186/s13054-022-04202-x