

Chapter 9

Innovations of Metaverse Technology in Healthcare: A Study on Melanoma Skin Cancer

Preethi N. Patil

 <https://orcid.org/0000-0002-1024-5621>

R.V. College of Engineering, India

C. Saravanan

 <https://orcid.org/0000-0002-8456-0210>

R.V. College of Engineering, India

Vibha T. R.

 <https://orcid.org/0009-0002-7043-4149>

R.V. College of Engineering, India

Andhe Dharani

 <https://orcid.org/0000-0001-9740-3882>

R.V. College of Engineering, India

ABSTRACT

The metaverse technologies, consisting of virtual reality (VR), augmented reality (AR), and mixed reality (MR), among others, is reshaping medical care in many ways such as boosted patient attention and medication, education for medical practitioners, as well as management of illnesses like melanoma skin cancer. This study examines some progressions that metaverse technology has made within public health through such an example as detection and cure of melanoma skin cancer. Early and accurate detection is necessary for improved patient outcomes, given the

DOI: 10.4018/979-8-3693-7703-1.ch009

fact that melanoma is the deadliest form of skin cancer. By 2024, about 100,640 new melanoma cases are predicted to occur in the U. S alone with 8,290 of them resulting into deaths. This chapter aims to offer a comprehensive insight into how these innovations are improving medical care delivery and outcomes by reviewing recent scholarly works, case studies, and technological trends.

INTRODUCTION

New innovations in metaverse especially in the VR, AR, and MR are rendering a new face to the healthcare industry in a way that solves fundamental questions in the diagnosis, treatment, and training aspects. Dermatology is one of the fields that gains lot of benefit from these innovations. Skin cancer is another health threat globally especially when not detected on time, and the worst type is Melanoma. According to the WHO (World Health Organization) and IARC (International Agency for Research on Cancer), the global figures of melanoma will stand at about 353, 947 new cases and 62,551 deaths in 2025 (Cancer Today, n.d.). In India also occurrence of melanoma is on the rise, 3689 new cases and 2197 deaths were recorded in 2022. According to the figure of USA, approximately 100,640 new melanoma cases and 8,290 deaths will be reported in 2024 indicating more advance diagnostic and therapeutic modalities are required (Cancer facts & figures 2024. American Cancer Society, n.d.-a). Metaverse technologies provide immersive diagnostic aids that help improve surgical accuracy as well as simulation platforms that aid in healthcare professionals training. The findings suggest that there is a potential for VR, AR, and MR to transform many areas of medicine such as early detection, patient involvement in their own treatment plans, telemedicine as well as more complicated surgical procedures.

Compared to other technologies, metaverse applications for the healthcare domain have specific characteristics because of the immersive nature of technologies, which in turn improves the interaction of users with Virtual space. For instance, in the case of Virtual Reality (VR), skin specialists, particularly dermatologists and oncologists use VR enabled examination of skin lesions in a three-dimensional environment, which has led to enhanced rates of early detection of melanoma signs (Joseph, J., & Lalchand, T. C, 2024). Early diagnosis is critical as it leads to high quality of treatment and increase the survival rate of the patients (Rigel, D.S. and Carucci, J.A., 2000).

Augmented Reality (AR) improves the melanoma diagnosis through coupling off deep learning algorithms for skin lesion classification with AR instructions for overlaying skin lesion views. It places calculated parameters and classification outcomes on the actual-time supply pictures to enhance the diagnostic procedure (R.

34 more pages are available in the full version of this document, which may be purchased using the "Add to Cart" button on the publisher's webpage: www.igi-global.com/chapter/innovations-of-metaverse-technology-in-healthcare/368929

Related Content

Sales Forecasting and Data-Driven Marketing Strategies for E-Commerce Platforms Using XGBoost

Minqiang Zhang and Linlin Wu (2025). *International Journal of Intelligent Information Technologies* (pp. 1-21).

www.irma-international.org/article/sales-forecasting-and-data-driven-marketing-strategies-for-e-commerce-platforms-using-xgboost/382563

Designing Scalable Location Based Games that Encourage Emergent Behaviour

Kate Lund, Mark Lochrie and Paul Coulton (2012). *International Journal of Ambient Computing and Intelligence* (pp. 1-20).

www.irma-international.org/article/designing-scalable-location-based-games/74367

The Future of Writing Instruction: Opportunities and Challenges of Artificial Intelligence, Tools, Ethics, and Instructional Practices

P. Umamaheswari, S. Nirmala, R. Mathi and D. Rajalakshmi (2026). *Leveraging AI for Future-Ready Writing Education* (pp. 93-118).

www.irma-international.org/chapter/the-future-of-writing-instruction/402991

An Agent-Based Approach to Process Management in E-Learning Environments

Hokyin Lai, Minhong Wang, Jingwen He and Huaqing Wang (2008). *International Journal of Intelligent Information Technologies* (pp. 18-30).

www.irma-international.org/article/agent-based-approach-process-management/2441

Role of AI Tools in Evaluating Brand Performance

Suryansh Chauhan and Shivani Thapliyal (2025). *Strategic Brand Management in the Age of AI and Disruption* (pp. 53-80).

www.irma-international.org/chapter/role-of-ai-tools-in-evaluating-brand-performance/369936