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Revolutionizing Dental Imaging: A Comprehensive Study on the Integration of Artificial Intelligence in Dental and Maxillofacial Radiology

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Recent advancements in deep learning and artificial intelligence (AI) have profoundly impacted various fields, including diagnostic imaging. Integrating AI technologies such as deep learning and convolutional neural networks has the potential to drastically improve diagnostic methods in the field of dentistry and maxillofacial radiography. A systematic study that adhered to Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) standards was carried out to examine the efficacy and uses of AI in dentistry and maxillofacial radiography. Incorporating cohort studies, case-control studies, and randomized clinical trials, the study used an interdisciplinary methodology. A thorough search spanning peer-reviewed research papers from 2009 to 2023 was done in databases including MEDLINE/PubMed and EMBASE. The inclusion criteria were original clinical research in English that employed AI models to recognize anatomical components in oral and maxillofacial pictures, identify anomalies, and diagnose disorders. The study looked at numerous research that used cutting-edge technology to show how accurate and dependable dental imaging is. Among the tasks covered by these investigations were age estimation, periapical lesion detection, segmentation of maxillary structures, assessment of dentofacial abnormalities, and segmentation of the mandibular canal. The study revealed important developments in the precise definition of anatomical structures and the identification of diseases. The use of AI technology in dental imaging marks a revolutionary development that will usher in a time of unmatched accuracy and effectiveness. These technologies have not only improved diagnostic accuracy and enabled early disease detection but have also streamlined intricate procedures, significantly enhancing patient outcomes. The symbiotic collaboration between human expertise and machine intelligence promises a future of more sophisticated and empathetic oral healthcare.

Biography

Dr. Aishwarya Padmanabhan is a dedicated academic and researcher at Sri Ramakrishna Dental College, India. She specializes in dental and maxillofacial radiology with a strong focus on emerging imaging technologies. Her research centers on the integration of artificial intelligence to enhance diagnostic accuracy. Dr. Padmanabhan has contributed to multiple studies exploring AI-driven radiological innovations. She is passionate about bridging clinical practice with cutting-edge digital advancements. She regularly participates in national and international forums to share her research insights. Her work aims to revolutionize dental imaging and promote more efficient, patient-centered diagnostics