

Artificial Intelligence in the Diagnosis of Maxillofacial Disorders

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Received: 2023-08-21 / Accepted: 2023-08-26 / Published Online: 2023-08-28

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Dear Editor,

Recently, studies and research have focused on the use of artificial intelligence (AI) in medical science [1,2]. It is probable that the healthcare industry, especially radiology, is a step or two ahead of the curve when using convolutional neural networks in clinical practice. The number of investigations into the use of radiography in daily life continues to grow, as does the number of accessible methods that have already impacted the issue of patient care, both of which are on the rise. In addition, there is a whole area devoted to Medical Imaging using AI. Additionally, a dedicated domain has emerged, focusing on the synergy between AI and Medical Imaging, particularly in the context of diagnosing Maxillofacial Disorders.

The diagnosis is made based on the patient's medical history, linked testing, and other susceptible variables, known to be risk factors for human memory retention. AI from human professionals performs much better than human specialists when using primary health data [3]. A study indicated that by using AI in conjunction with clinical diagnostics, the accuracy and efficiency of diagnosis might be significantly improved.

Recently, machine learning techniques have been used to diagnose several illnesses, including tumors, cancer, and metastases, among others. These algorithms demonstrated excellent reliability in distinguishing periapical cysts from keratocystic odontogenic tumors when manually created parameters [4] were used in their development. However when these approaches, such as convolutional neural network (CNN), were employed to examine the cytological pictures gathered, they revealed an inadequate performance error in identifying malignant lesions of the mouth. Although these results are hopeful, existing AI algorithms for diagnosing oral and maxillofacial lesions predominantly rely only on a single type of data, cytopathological reports. Using models that include the patient's medical history is critical for a more accurate analysis [5].

Deep learning (DL) and CNN have made significant contributions to AI in caries and endodontics because of their capacity to automate waste categorization and classification. To



classify radiographs or photographs, several criteria, including comparable qualities, are used to separate them into many discontinuous sections [6]. This process results in predictable data being generated from unpredictable data. Using understanding network (U-Net), the DL categorizes the cone beam computed tomography (CBCT) vertices into “lesions,” “tooth structures,” “bones,” “restorative materials,” and “backgrounds,” with the findings comparable to the diagnosis of total lesions. Apical is a company that supplies doctors [7]. Distal caries lesions may also be detected by DL using imaging data [8].

The clinical signs and symptoms that the patient exhibits are crucial in diagnosing temporomandibular disorders (TMD). It is a method for converting spoken language into an ordered computer language known as speech processing. It was found that constructing a software model based on the sorts of words used in the patient’s speech and the size of their mouth was more successful than using the actual mode [9]. A full degree of agreement between AI and the physician is shown in AI’s identification of condyle morphology.

Reviewing these articles was instructive since it provided us with an opportunity to observe the diverse range of approaches that have been created and assessed across a diverse range of images and experiences. However, it is important to note that no one has determined how these approaches will be integrated into a clinical workflow or, more importantly, whether and how they will impact radiologists’ diagnostic accuracy and efficiency, and consequently, patient outcomes. Therefore, it is difficult to predict which ones will be implemented in a clinical environment. As underscored by the study findings, continued research endeavors are imperative to harness the full potential of AI in transforming the landscape of diagnosing Maxillofacial Disorders.

Best regards,

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How to Cite;

Bolbolian M, Tofangchiha M (2023) Artificial Intelligence in the Diagnosis of Maxillofacial Disorders. Eur J Ther. 29(4):959-960. <https://doi.org/10.58600/eurjther1806>