IJARSCT
ISSN (Online) 2581-9429
International Journal of Advanced Research in Science, Communication and Technology (IJARSCT)
International Open-Access, Double-Blind, Peer-Reviewed, Refereed, Multidisciplinary Online Journal
Impact Factor: 7.67
Volume 5, Issue 7, March 2025

Advancements in Facial Paralysis Detection: A Review of Machine Learning and Deep Learning Approaches

Shweta Rajendra Narute[1] and Prof. Dr. Nagesh Jadhav[2]
Department of Computer Science & Engineering (Intelligent System & Analytics)[1,2]
MIT, ADT, University, Loni, Pune, India
shwetanarute3777@gmail.com and nagesh.jadhav@mituniversity.edu.in

Abstract: *Facial paralysis drastically changes the lives of individuals and magnifies physicians' requirement for timely and accurate diagnosis and grading of facial paralysis for proper treatment and rehabilitation. Indeed, ordinary technologies such as manual examination and electromyography are very subjective, expensive, and too lengthy to detect facial paralysis. The notion of intelligent systems implementing ML and DL is a quantum leap in the field, enabling automation, precision, and scalability. This review article delves into the improvements in facial paralysis recognition and how the issues are solved through classical methods, mixed, and DL approaches. The study points out that the methods, the facial landmark analysis, the convolutional neural networks (CNNs), generative adversarial networks (GANs), and ensemble methods, which entail the implementation of different algorithms, have all have remarkable accuracy in the test, efficiency, and robustness. In addition, it has become possible to gauge real-time access to the diseased population by utilizing multimodal diagnostic systems, smartphones, and telemedicine applications. Despite these developments, issues like the limitations of data sets, lack of diversity, time restraints in real-time operations, and false model interpretations are still the real hindrances. The critique pinpoints the serious areas of study that already exist. It has a strong thesis on getting more prominent, still diverse datasets, using interpretable AI models, and seamlessly integrating into the clinical environment. Additionally, the writers urged the future search for more advanced features like the fusion technique and hybrid models that can be applied to detection and grading. This paper offers researchers and practitioners an extensive comprehension of the present approaches, challenges, and what lies ahead for future development, namely, the development of innovative and accessible intelligent systems for face paralysis recognition*

Keywords: Facial Paralysis Recognition, Deep Learning, Machine Learning, Facial Landmarks, Generative Adversarial Networks, Convolutional Neural Networks