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A Review on Deep Learning-Based AI Systems for Clinical Decision Support and Disease Prediction

Vishal Vishnu Gurav[1] and Prof. D. B. Thakur[2]
Department of Electronics & Telecommunication[1]
Associative Professor, Department of Electronics & Telecommunication[2]
TPCT's College of Engineering, Dharashiv, India

Abstract: *The exponential growth of healthcare data has created vast opportunities for intelligent disease prediction, which plays a crucial role in improving patient care and reducing treatment costs. This research presents a smart disease prediction and health assistance system powered by the XGBoost machine learning model, integrating patient medical history and symptom analysis. The proposed system accepts user-input symptoms, processes them through the trained XGBoost classifier, and predicts the most probable disease with high accuracy. Furthermore, it categorizes the disease severity into low, moderate, high, or extreme levels. Based on the prediction and severity analysis, the system provides personalized health recommendations—including suitable medications, diet plans, exercise routines, and necessary precautions—while advising medical consultation for severe conditions. By leveraging structured healthcare datasets and advanced machine learning techniques, this approach enhances prediction precision, promotes preventive healthcare, and improves accessibility for patients in remote regions. Ultimately, the system bridges the gap between automated diagnosis and personalized medical guidance, contributing to a more efficient, data-driven healthcare ecosystem.*

Keywords: XGBoost, Disease Prediction, Machine Learning, Symptom Analysis, Medical Recommendation System, Patient Management

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