

Title: Machine Learning-Based Prediction of COVID-19: A Robust Approach for Early Diagnosis and Treatment

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Abstract: The worldwide health catastrophe sparked by the COVID-19 epidemic continues, emphasizing the need for novel solutions in prediction, early diagnosis, and treatment. While vaccine development has progressed, the virus's eradication remains questionable. This research presents a strong machine learning-driven approach to addressing this complicated problem. Rapid viral transmission and the lack of a single cure hamper illness diagnosis and treatment, particularly in highly populated developing countries like Bangladesh. Against this context, machine learning and artificial intelligence have emerged as critical instruments for the improvement of health care and medical research. This research investigates several machine learning algorithms and approaches that show potential for COVID-19 prediction. Among these is an algorithm that assesses individual vulnerability and environmental variables, allowing for self-diagnosis and early intervention, reducing the strain on healthcare institutions and government resources. This study demonstrates how machine learning may improve forecast accuracy and provide proactive treatment in pandemic management. Advanced techniques, such as K-nearest neighbor, Decision Tree, Random Forest, AdaBoost, XGBoost, Stochastic Gradient Descent, Linear SVC, Perceptron, Naive Bayes, Support Vector Machines, Logistic Regression, and Discriminant Analysis, are essential for achieving the best results. Finally, this research emphasizes the need for novel responses to global health challenges. Healthcare systems may improve their forecasting capacities and early intervention techniques by leveraging machine learning. This paper highlights technology's revolutionary impact in redefining healthcare paradigms and encouraging resilience in the face of enormous difficulties..

Keywords: COVID-19, Machine learning, Data mining, Prediction, Classification

DOI: https://doi.org/10.1007/978-981-97-1923-5_16

https://link.springer.com/chapter/10.1007/978-981-97-1923-5_16