A Review on Integrating IoT Devices and Machine Learning for Disease Recognition and Management of Respiratory System

U.C. Wickramarathne*, M.G. Jayawickrama and S.S. Tissera
Department of Computer Science, Faculty of Applied Sciences, University of Sri Jayewardenepura, Sri Lanka

Abstract: The convergence of the Internet of Things (IoT) and Machine Learning (ML) has brought significant advancements in healthcare, particularly in the detection and management of respiratory diseases. This comprehensive review explores the combination of IoT devices and ML algorithms for recognizing and monitoring respiratory conditions. Traditional manual monitoring methods can be prone to inaccuracies and inefficiencies, while IoT devices provide reliable and continuous respiration monitoring, allowing for early detection and timely intervention. ML, with its ability to analyze large datasets and identify patterns, enhances predictive capabilities in healthcare systems. When combined with IoT data, ML algorithms can detect anomalies, predict disease progression, and recommend interventions. This review paper examines a range of studies and applications that highlight the role of IoT and ML in monitoring respiratory conditions, including during the COVID-19 pandemic, detecting Chronic Obstructive Pulmonary Disease (COPD), predicting asthma risk, diagnosing lung diseases and monitoring infants. The review also addresses the challenges like interoperability, data security, and the need for robust computational resources. Despite these challenges, the potential of IoT and ML to revolutionize respiratory disease management is immense. Future research should focus on enhancing sensor technology, developing more advanced ML algorithms, and ensuring compliance with regulatory standards to improve accuracy, reliability, and widespread adoption of these technologies.

Keywords: Disease management, Disease recognition, Internet of things, Machine learning, Respiratory diseases.

*Corresponding author's email: chamouchirawick99@gmail.com