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Development of a Web Application for Asthmatic Wheeze Detection Using Convolutional Neural Networks

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Abstract

Asthma and Chronic Obstructive Pulmonary Diseases are two lung conditions that frequently exhibit breathing problems. If you have asthma, your airways may become more constricted, enlarged, and mucus-producing. This could block your airways and result in wheezing, whining, coughing, and shortness of breath. As a result, wheezing can be a vital diagnostic tool for determining the presence of many disorders. An individual's respiratory rate increases when they wheeze, and as a result, their lungs are more likely to work harder than they normally would, and it will pose a significant health challenge and can lead to severe complications if not detected and managed early. In this research, we present a web application for asthmatic wheeze detection using Convolutional Neural Networks (CNNs) for the early identification of respiratory disorders in Sri Lanka. The system leverages a web application server to receive audio recordings from an electronic stethoscope and applies a CNN model to analyse the data and detect wheeze. Additionally, the system provides therapy recommendations and dosage prescriptions based on the detected respiratory disorder. The developed model achieves an accuracy of 74.68% in wheeze detection. This research aims to improve respiratory health monitoring in Sri Lanka and provide healthcare professionals with a reliable tool for early intervention.

Keywords: *Chronic Obstructive Pulmonary Diseases, Asthma, Wheezing, Convolutional Neural Network*