Using Machine Learning for Pneumonia Diagnosis

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Using Machine Learning for Pneumonia Diagnosis Pneumonia is among the leading causes of death in the world and it is ranked sixth-leading cause of premature death in South Africa. The people at risk of dying from pneumonia are children younger than 5 years, adults over 65 years and immunocompromised individuals. Radiological diagnosis is the most common way of diagnosing patients and radiograph qualities are easily compromised due to the sensitivity and specificity of diagnosis. Compromised x-rays make it difficult to establish a diagnosis. To make diagnosis quicker and more accurate for a health professional, the purpose of this project was to develop a machine learning model that can identify and distinguish the difference between lungs that are infected and those that are not infected by pneumonia in an efficient manner. Two machine learning models were created to identify and distinguish pneumonia in adult patients and pediatric patients. The general and pediatric-specific pneumonia diagnosis models were tested against x-ray images and predictions were validated against validated data and a radiologist. The general pneumonia diagnosis model focused on adult patients and achieved an accuracy of 90.3%. While the pediatric- specific model focused on pediatric patients and achieved an accuracy of 83.03%. The algorithm created is able to identify and distinguish the difference between a pair of infected pneumonia lungs and a pair of lungs that are not infected in an efficient manner for adult patients and pediatric patients.

Awards Won: