AI Model for Detecting Chronic Diseases

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Abstract

Lung and kidney diseases are chronic diseases that require rapid diagnosis for improved treatment. This project developed an AI system that can identify these diseases and determining their severity. The system has two models: one based on Convolutional Neural Networks (CNN) to analyse medical images, including histopathology images for lung disease and CT scans for kidney disease, and another based on a Recurrent Neural Network (RNN) to analyse patient's structured data.

For kidney disease, the system assesses the symptoms/structured patient data like creatinine level, glomerular filtration rate (GFR), and along with CT scan imaging information. For lung disease, it examines the histopathology images and symptoms for detecting abnormalities. The system supports users to upload medical images and patient information and gives predictions about the existence and severity of the disease.

Data is pre-processed, enriched, and split between training and test sets for guaranteed results. Metrics like F1-score, precision, accuracy and recall are used for performance evaluation. The system is also speed-optimized to be applicable for real-time clinical use. With flexibility and guaranteed results, this AI system enables early detection of lung and kidney diseases by doctors, enhancing patient outcomes and better treatment planning.

Keywords

Chronic Disease Diagnosis, Deep Learning, Convolutional Neural Networks (CNN), Recurrent Neural Networks (RNN), Medical Image Processing.