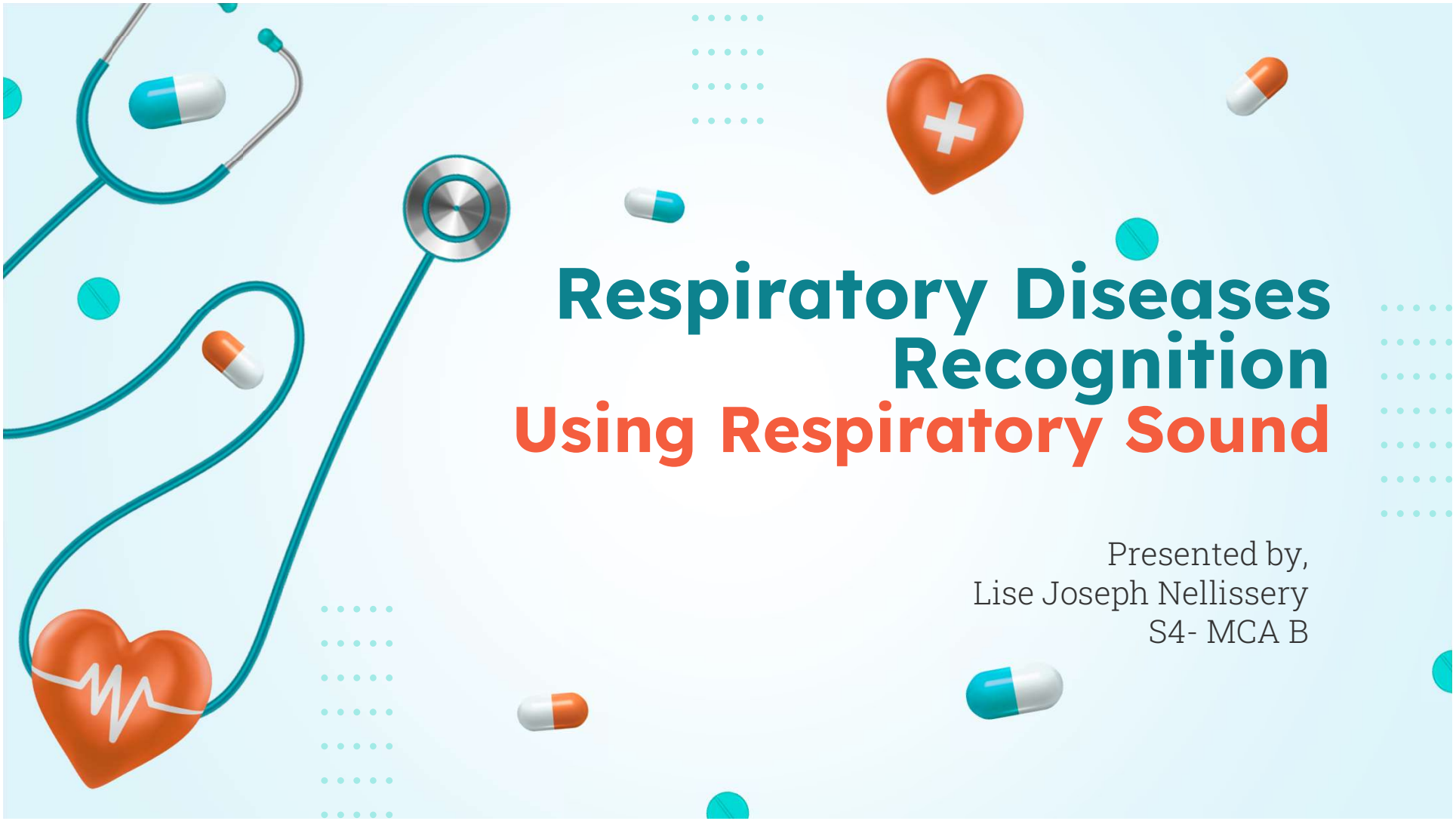


Respiratory Diseases Recognition

Using Respiratory Sound

Presented by,
Lise Joseph Nellissery
S4- MCA B

Introduction

Respiratory diseases may be caused by infection, by smoking tobacco, or by breathing in secondhand tobacco smoke, radon, asbestos, or other forms of air pollution.

Breath sound have three characters; frequency, intensity, and quality; which helps us to differentiate two similar sounds. Auscultation of the lung is an important part of respiratory examination and is helps in diagnosing various respiratory disorders. Auscultation assesses airflow through the trachea-bronchial tree.

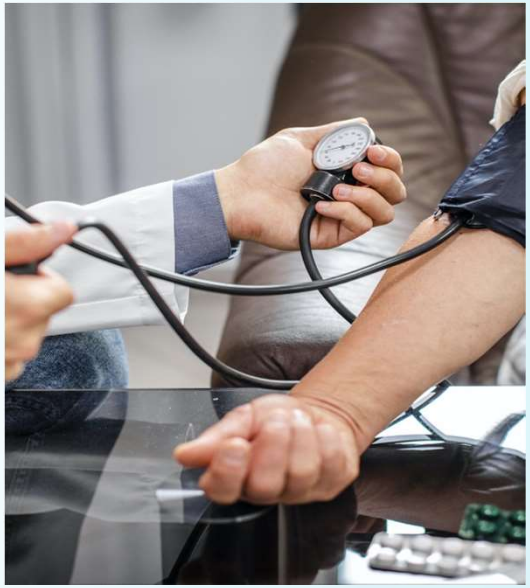
Respiratory audios are important indicators of respiratory health and respiratory disorder. For example, a wheezing sound is a common sign that a patient has an obstructive airway disease like asthma or chronic obstructive pulmonary disease (COPD).

Relevance of the topic

Respiratory audios are important indicators of respiratory health and respiratory disorder.

By the development of this system , doctors can easily diagnosis the disease effected on the respiratory system, condition of the system whether it is healthy or not just by the respiratory sound.

Although , we can save the time and cost . Along with , mentioning the condition of the respiratory system the proposed model also gives some suggestion for the easily recover of health such as exercise , food habits and so on.

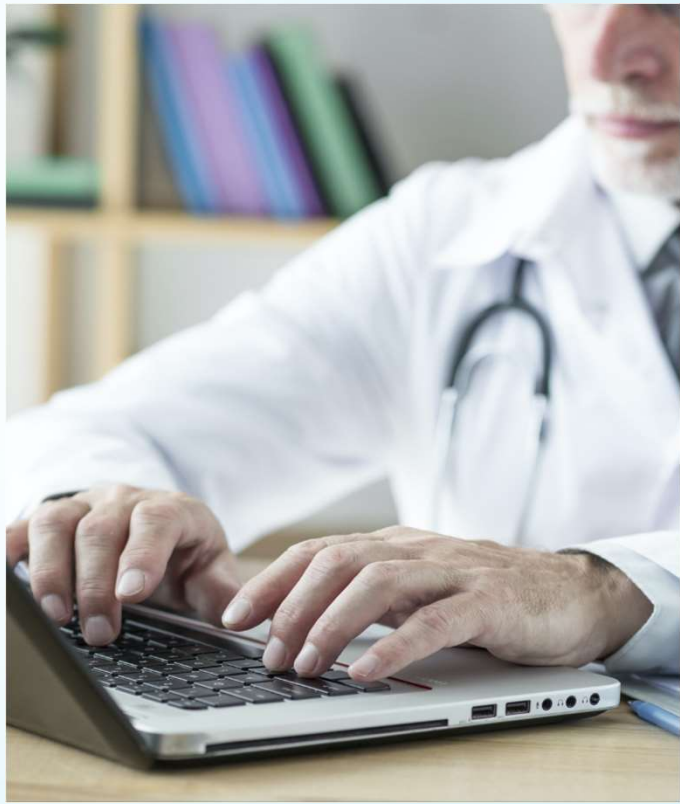


Description of the project

Artificial Intelligence has always proven to solve any task or problem in the most efficient and enhanced way.

The proposed system uses Deep learning which is a subpart of Artificial intelligence for the detection of respiratory diseases. A deep neural network model that would learn from the features extracted from the respiratory sound to classify the condition of a respiratory system.

Using the A.I. model for the diagnosis would highly reduce the extract cost and time for manual diagnosis by doctors and pharmacists.



Respiratory audios are important indicators of respiratory health and respiratory disorder. For example, a wheezing sound is a common sign that a patient has an obstructive airway disease like asthma or chronic obstructive pulmonary disease (COPD).

Prediction of respiratory diseases such as COPD(Chronic obstructive pulmonary disease), URTI(upper respiratory tract infection), Bronchiectasis, Pneumonia, Bronchiolitis with the help of deep neural networks or deep learning.

The proposed model takes respiratory sound as input and classifies the condition of its respiratory system. It not only classifies among the above-mentioned disease but also classifies if a person's respiratory system is healthy or not with higher accuracy and precision.

Along with , mentioning the condition of the respiratory system the proposed model also gives some suggestion for the easily recover of health such as exercise , food habits and so on.

Existing Vs Proposed

The existing system just predict respiratory diseases such as COPD(Chronic obstructive pulmonary disease), URTI(upper respiratory tract infection), Bronchiectasis, Pneumonia, Bronchiolitis with the help of deep neural networks or deep learning.

The model takes respiratory sound as input and classifies the condition of its respiratory system. It not only classifies among the above-mentioned disease but also classifies if a person's respiratory system is healthy or not with higher accuracy and precision.

Whereas , the proposed system provides suggestions in order to help the patient or user to get well soon from their condition. The suggestions may include exercise, food habits etc along with the prediction of respiratory diseases.

Input / Output

The input of the proposed system is provided by the user . The user gives respiratory sound as the input to the system.

Then the proposed system process the user given audio and predict the respiratory diseases with the help of deep neural networks or deep learning.
The proposed model takes respiratory sound as input and classifies the condition of its respiratory system.

It not only classifies among the above-mentioned disease but also classifies if a person's respiratory system is healthy or not with higher accuracy and precision.

Modules

Data preprocessing :

Data preprocessing is an iterative process for the transformation of the raw data into understandable and useable forms. We performed data augmentation with other classes in the data-set.

Training the model :

A training model is a dataset that is used to train an algorithm. It consists of the sample output data and the corresponding sets of input data that have an influence on the output.

Model evaluation :

Model evaluation techniques in deep learning are helping us to find a better model among all other models in deep learning.

Tools used for implementation

Python used as the programming language to implement the model. For feature extraction from the audio data, we have used the library ***Librosa***.
For data visualization, we have used ***matplotlib*** library.
For constructing the deep neural network we have used ***Keras***, a python deep learning library with TensorFlow in the backend.

Html and ***Css*** are used to develop web application as front end for the system.

Dataset and Research paper

For this project I used ***respiratory-sound-database*** dataset from Kaggle.
The respiratory sounds in the dataset are of different category such as Healthy, COPD(Chronic obstructive pulmonary disease), URTI(upper respiratory tract infection), Bronchiectasis, Pneumonia, Bronchiolitis, Asthma, LRTI(Lower respiratory tract infection) which would be classified or predicted by out neural network model.

And the research paper used for this project is published by IEEE , the title of paper is ***"Respiratory diseases recognition through respiratory sound with the help of deep neural network"***

Git Usage

GitHub is a code hosting platform for version control and collaboration. It lets you and others work together on projects from anywhere.
Git is a DevOps tool used for source code management. It is a free and open-source version control system used to handle small to very large projects efficiently. Git is used to tracking changes in the source code, enabling multiple developers to work together on non-linear development.

Git Hub: https://github.com/lise1905/main_project

References

[1] Respiratory diseases recognition through respiratory sound with the help of deep neural network.
[2] Dataset link : https://www.kaggle.com/datasets/vbookshelf/respiratory-sound-database


“Live Healthy, Stay Young At Heart”
Thank you!!