



Estimation of Respiratory Rate through Breathing Audio

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Abstract

Respiratory sound classification plays a crucial role in diagnosing respiratory diseases and monitoring patients' conditions. This project presents a code implementation for respiratory sound classification using machine learning techniques. By leveraging the power of machine learning techniques, this code contributes to improvements the respiratory healthcare by providing a tool for automated respiratory sound classification and analysis.

Methodology

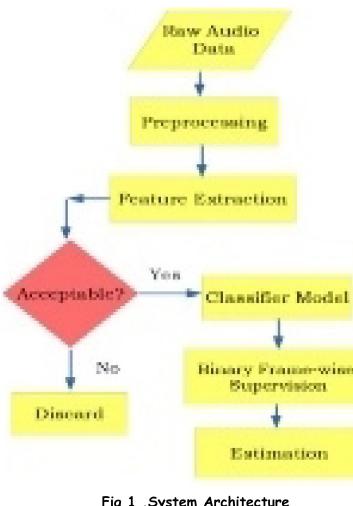


Fig 1 .System Architecture

Results

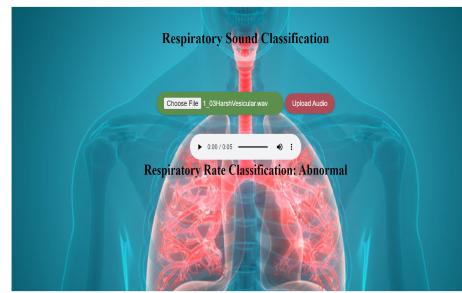


Fig 2. Results indicating Normal and Abnormal estimates

Analysis

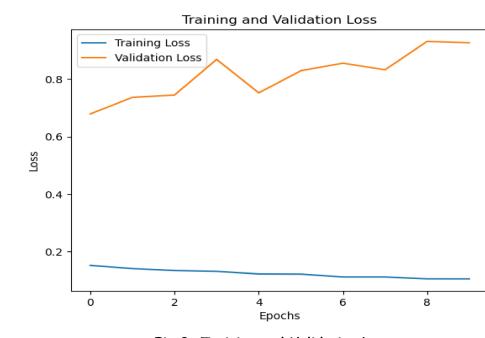


Fig 3. Training and Validation Loss

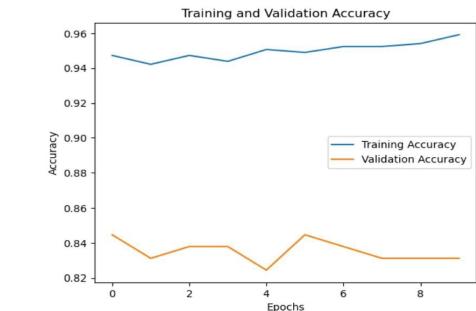


Fig 4. Training and Validation Accuracy

Applications

- Easy and Accurate measurement of respiratory rates of patients of any age groups
- Regular Monitoring of respiratory rates of patients with Breathing problems.
- Estimation of respiratory rates of patients with some serious lungs disorders.
- An easy detection application to validate if the respiratory rates of a person is normal or abnormal
- The overall application of the software is to detect the respiratory rates of Human beings, easy, accurate and early detection leading to early treatment and cure of the disease.

Conclusion

- Our project proposes a machine learning based Estimation of respiratory rate through breathing audio taken using mobile phone which is robust, accurate and amenable to busy clinic and telehealth settings.
- Development of this software led to easy, accurate and highly efficient estimation of Respiratory rates which is an important vital sign for indicating a person's health.

Objectives

- Develop a respiratory rate estimation system using audio data.
- Improve the accuracy and reliability of respiratory rate estimation compared to current estimation methods.
- Implement a user-friendly web application for uploading audio files and obtaining respiratory rate results. Incorporate machine learning techniques to classify respiratory sounds as normal or abnormal.
- Enhance the system's performance by leveraging deep learning models such as convolutional neural networks (CNNs).
- Provide real-time estimation of respiratory rate to facilitate prompt medical assessment.
- Evaluate the system's performance on a diverse dataset to ensure robustness and generalizability.
- Enable easy integration with existing healthcare systems for seamless adoption and utilization.
- Contribute to the advancement of respiratory rate monitoring by leveraging technology and machine learning algorithms.