

LEPROSY CASE DETECTION & HEALTH MONITOR

Synopsis: Leprosy Case Detection Machine Learning Model Project

Introduction

- Leprosy, also known as Hansen's disease, is one of the oldest diseases known to humankind, dating back to biblical times.
- Throughout history, leprosy has been shrouded in superstition, stigma, and fear, leading to discrimination and isolation of affected individuals.
- Despite significant progress in medical science, leprosy remains a global health concern, with over 200,000 new cases reported annually.
- This project aims to leverage machine learning to improve early detection and prediction of the ultimate stage of leprosy, thereby enhancing patient care and reducing the associated stigma.

Overview

- Leprosy, caused by the bacterium *Mycobacterium leprae*, primarily affects the skin, peripheral nerves, and mucous membranes.
- The disease has a long incubation period, making early diagnosis crucial for effective treatment and prevention of disabilities.
- Detection methods currently rely on clinical examination and microscopic analysis, which can be subjective and time-consuming.
- Machine learning offers the potential to automate and improve the accuracy of leprosy diagnosis by analysing patient data.

Project Objectives

The primary objectives of this project are as follows:

- Develop a machine learning model for leprosy detection and classification based on patient data.
- Improve early diagnosis by identifying subtle patterns and features that may go unnoticed during manual examination.
- Predict the progression of leprosy to its ultimate stage to enable timely intervention.
- Reduce the stigma associated with leprosy by promoting early treatment and patient support.
- Create a user-friendly interface for healthcare providers to input patient data and receive diagnostic results.

Data Collection and Preprocessing

- Collecting a comprehensive dataset of patient information, including clinical, demographic, and laboratory data.
- Cleaning and preprocessing the data to remove outliers and missing values.
- Exploring feature engineering techniques to extract relevant information from the data.

Model Development

- Utilizing machine learning algorithms such as decision trees, random forests, and deep learning models to train the leprosy detection system.
- Implementing cross-validation and hyperparameter tuning to optimize model performance.
- Incorporation of interpretability techniques to provide insights into model decisions.

Deployment and User Interface

- Developing a user-friendly web-based interface for healthcare professionals to input patient data.
- Deploying the machine learning model on a secure server to provide real-time predictions.
- Ensuring compliance with data privacy and security regulations.

Future Enhancements

- Continuously updating and improving the model with additional data and emerging machine learning techniques.
- Expanding the scope to include prediction of treatment outcomes and disability progression.
- Collaboration with healthcare organizations and policymakers to integrate the model into clinical practice.

Conclusion

- The Leprosy Case Detection Machine Learning Model project aims to combat the historical stigma associated with leprosy by providing early and accurate diagnosis.
- By leveraging modern technology and data science, this project has the potential to make a significant impact on leprosy control and patient care.
- Through ongoing research and collaboration, we aspire to contribute to the global effort to eliminate leprosy as a public health concern.

Details & Signatures of project workers (Students)

ANIRBAN LAYEK (BCA 5th SEM 05)

Signature –

PRADIP MONDAL (BCA 5th SEM 06)

Signature –

RONI MONDAL (BCA 5th SEM 07)

Signature –

ANIBARJA SIKARI (BCA 5th SEM 36)

Signature –