MEDIMAPPER:NAVIGATING HEALTHCARE DATA FOR PRECISION MEDICINE

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AGENDA

- ABSTRACT
- INTRODUCTION
- EXISTING SYSTEM
- PROPOSED SYSTEM
- MODULE DESCRIPTION
- OUTCOMES

ABSTRACT

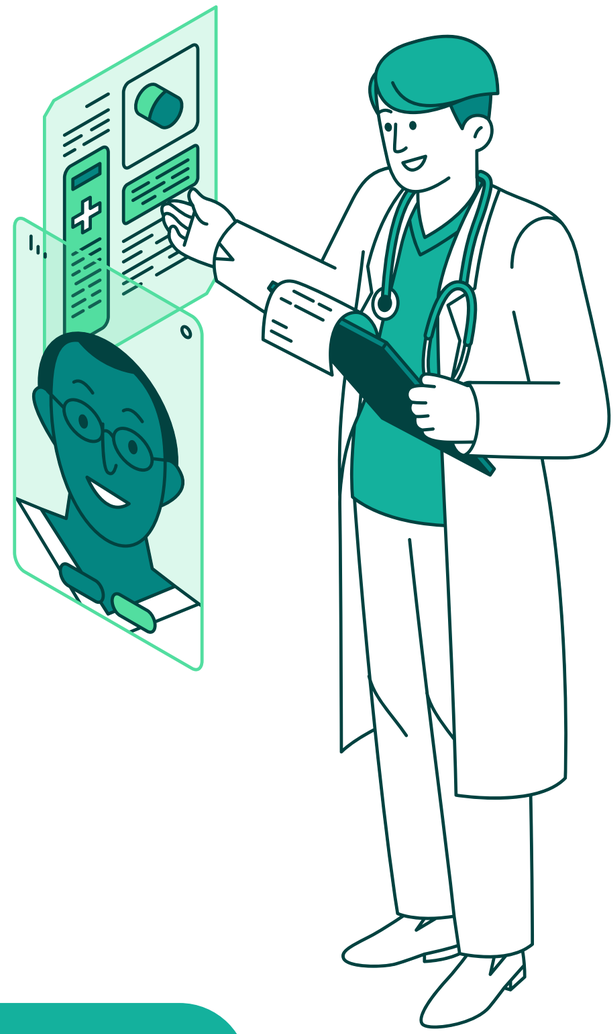
- In the era of precision medicine, leveraging healthcare data effectively is paramount to personalized treatment strategies. This study explores the landscape of navigating healthcare data for precision medicine through the lens of machine learning. We delve into the challenges and opportunities presented by healthcare data, including electronic health records (EHRs), data. Machine learning techniques offer powerful tools for analyzing these diverse datasets, extracting meaningful patterns, and facilitating the development of personalized treatment plans tailored to individual patients.

ABSTRACT

- We discuss the role of machine learning algorithms in disease diagnosis, prognosis, treatment selection, and therapeutic response prediction. Additionally, we examine the importance of data quality, interoperability, and privacy considerations in healthcare data analytics. By harnessing the potential of machine learning and navigating healthcare data effectively, precision medicine can be realized, leading to improved patient outcomes and healthcare delivery

INTRODUCTION

- Explore the role of machine learning algorithms in healthcare data analysis, highlighting their potential to revolutionize various aspects of healthcare delivery.
- By leveraging machine learning, healthcare organizations can gain deeper insights into patient populations, identify predictive biomarke`rs for disease, personalize treatment plans, and optimize healthcare operations.
- Additionally, machine learning algorithms can aid in the early detection of diseases, facilitate risk stratification, and enable proactive interventions to prevent adverse health outcomes.



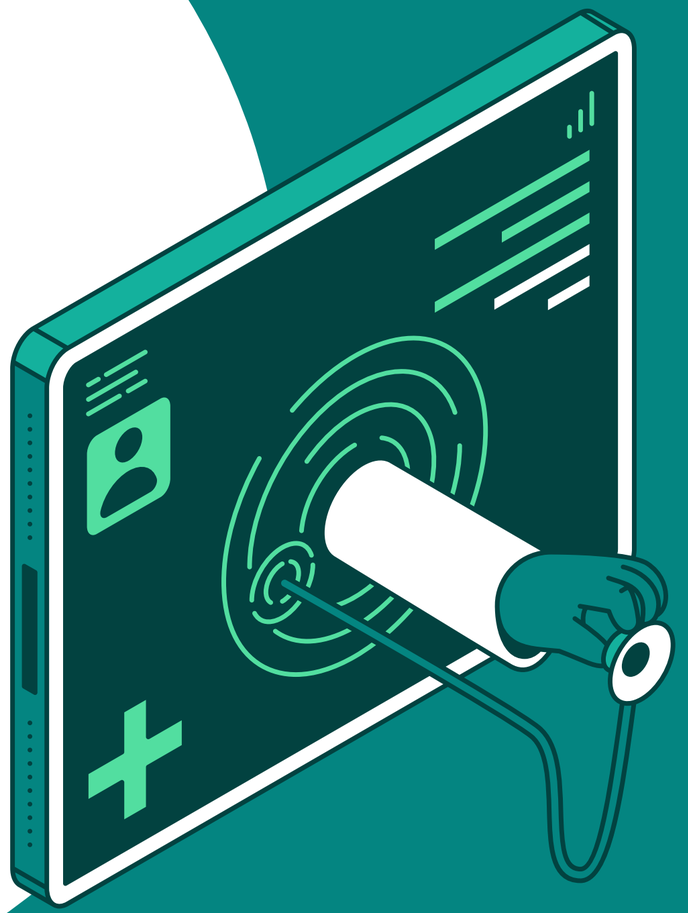
EXISTING SYSTEM

- In this existing system, focused on how data mining techniques can be used to predict health care data in advance such that patient is well treated.
- An important task of any diagnostic system is the process of attempting to determine and/or identify a possible disease or disorder and the decision reached by this process
- For this purpose, machine learning algorithms are widely employed.

- For these machine learning techniques named as Support Vector machine to be useful in medical diagnostic problems, they must be characterized by high performance, the ability to deal with missing data and with noisy data, the transparency of diagnostic knowledge, and the ability to explain decisions

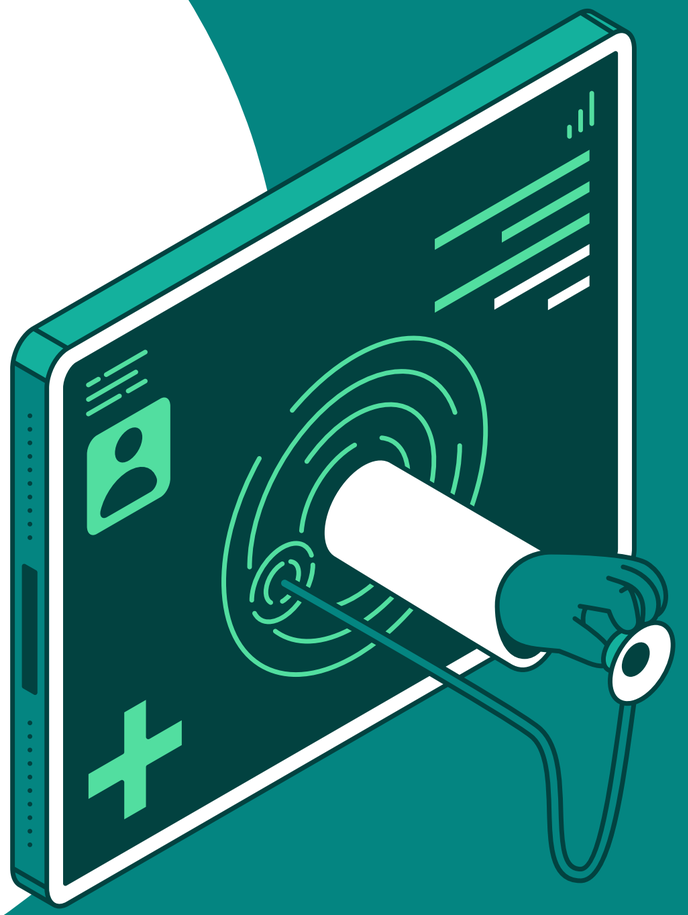
DISADVANTAGES

- Labelled data based disease classification
- Provide high number of false positive
- Computational complexity is high



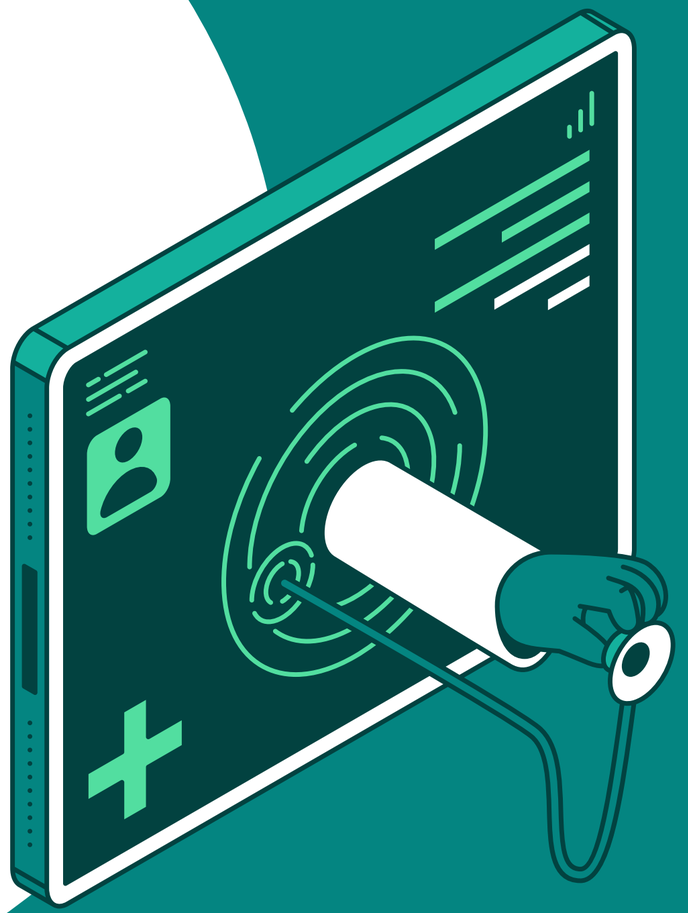
PROPOSED SYSTEM

- This project explores a Random forest algorithm model which combines the results of multiple supervised learning models to increase prediction ability.
- In this study, we utilize multiple supervised learning models for classification of at-risk patients such as normal, abnormal or inclusive
- Classify the datasets and predict the health status with improved accuracy rate



ADVANTAGES

- Handling missing data: RF algorithm can handle missing data, which is common in medical datasets.
- Interpretability: RF algorithm provide some level of interpretability, allowing medical professionals to understand how the algorithm arrived at a particular prediction.



MODULES

FRAMEWORK CONSTRUCTION

PREPROCESSING

FEATURES EXTRACTION

CLASSIFICATION

FRAMEWORK CONSTRUCTION

- This synthetic healthcare dataset has been created to serve as a valuable resource for data science, machine learning, and data analysis enthusiasts.
- It is designed to mimic real-world healthcare data, enabling users to practice, develop, and showcase their data manipulation and analysis skills in the context of the healthcare industry.
- **Name:** This column represents the name of the patient associated with the healthcare record.
- **Age:** The age of the patient at the time of admission, expressed in years.

FRAMEWORK CONSTRUCTION

- **Doctor:** The name of the doctor responsible for the patient's care during their admission.
- **Hospital:** Identifies the healthcare facility or hospital where the patient was admitted.
- **Insurance Provider:** This column indicates the patient's insurance provider, which can be one of several options, including "Aetna," "Blue Cross," "Cigna," "UnitedHealthcare," and "Medicare."
- **Billing Amount:** The amount of money billed for the patient's healthcare services during their admission. This is expressed as a floating-point number.

FRAMEWORK CONSTRUCTION

- **Discharge Date:** The date on which the patient was discharged from the healthcare facility, based on the admission date and a random number of days within a realistic range.
- **Medication:** Identifies a medication prescribed or administered to the patient during their admission. Examples include "Aspirin," "Paracetamol," and "Lipitor."
- **Test Results:** Describes the results of a medical test conducted during the patient's admission. Possible values include "Normal," "Abnormal," or "Inconclusive," indicating the outcome of the test.

PREPROCESSING

- Data pre-processing is an important step in the [data mining] process. The phrase "garbage in, garbage out" is particularly applicable to data mining and machine learning projects.
- In this module, we can eliminate the irrelevant values and also estimate the missing values of data. Finally provide structured datasets.

FEATURES SELECTION

- Feature selection refers to the process of reducing the inputs for processing and analysis, or of finding the most meaningful inputs.
- A related term, feature engineering (or feature extraction), refers to the process of extracting useful information or features from existing data.
- Filter feature selection methods apply a statistical measure to assign a scoring to each feature. The features are ranked by the score and either selected to be kept or removed from the dataset.

FEATURES SELECTION

- The methods are often uni-variate and consider the feature independently, or with regard to the dependent variable.
- It can be used to construct the diabetic and heart diseases.
- In this module, select the multiple features from uploaded datasets.

CLASSIFICATION

- In this module implement classification algorithm to predict the health status and using machine learning algorithm such as random forest algorithm to predict the health level
- A random forest algorithm is a tree based model that maps sets of input data onto a set of appropriate outputs.

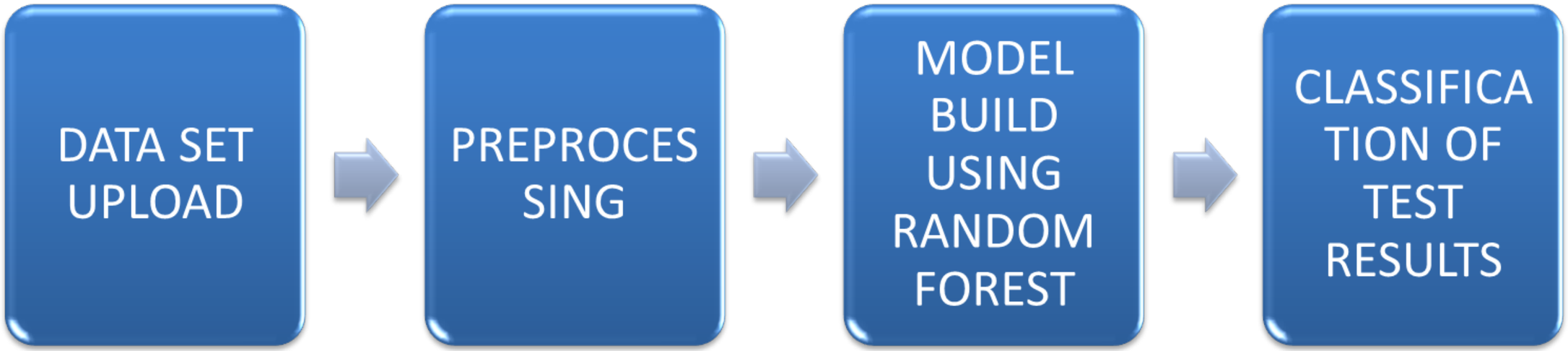
HARDWARE REQUIREMENTS

- **Processor** : Intel processor
- **RAM** : 4GB
- **Hard disk** : 160 GB
- **Compact Disk** : 650 Mb
- **Keyboard** : Standard keyboard
- **Monitor** : 15 inch color monitor

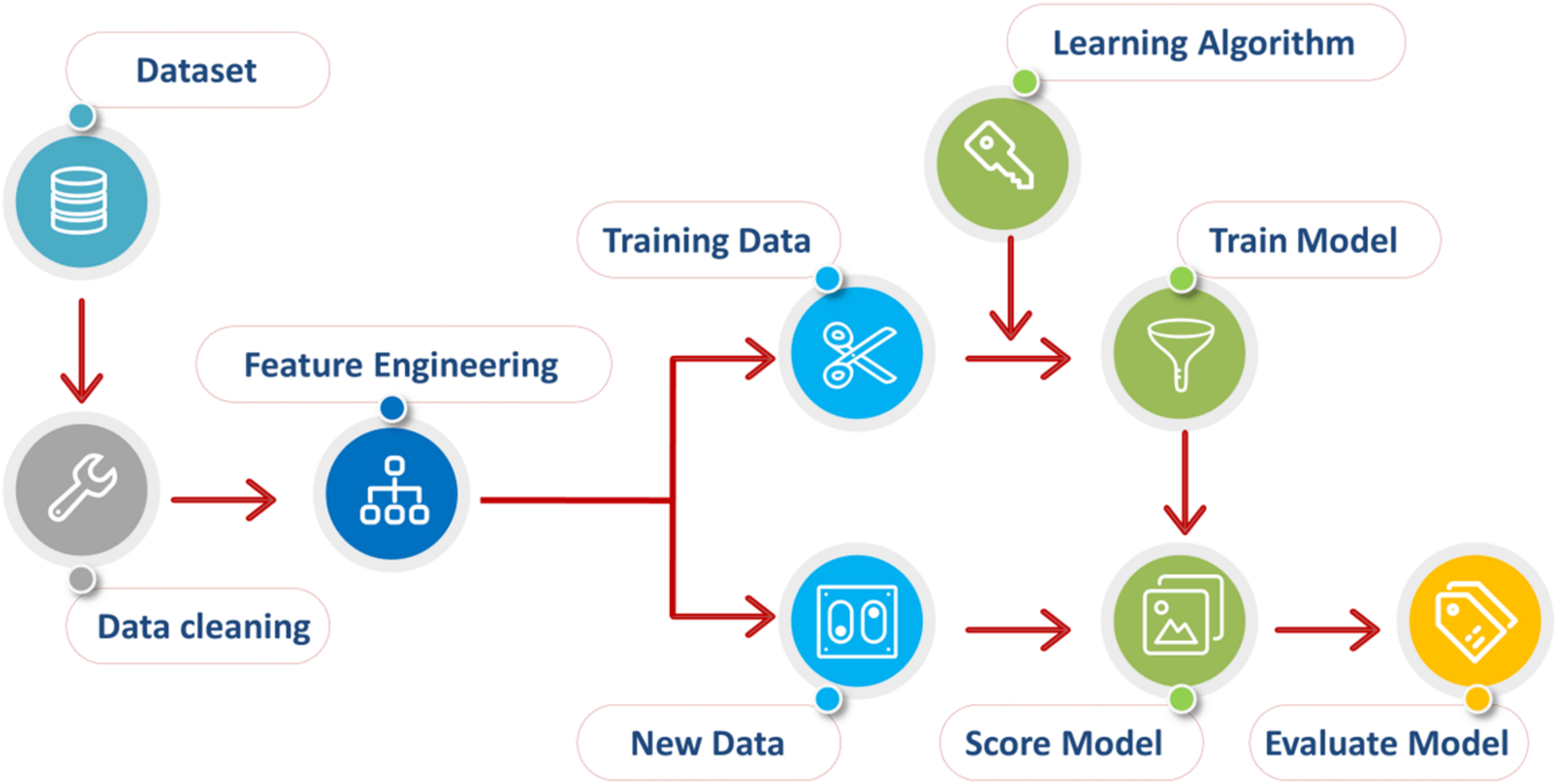
SOFTWARE REQUIREMENTS

- **Operating system** : Windows OS
- **Front End** : PYTHON
- **IDE** : PYCHARM

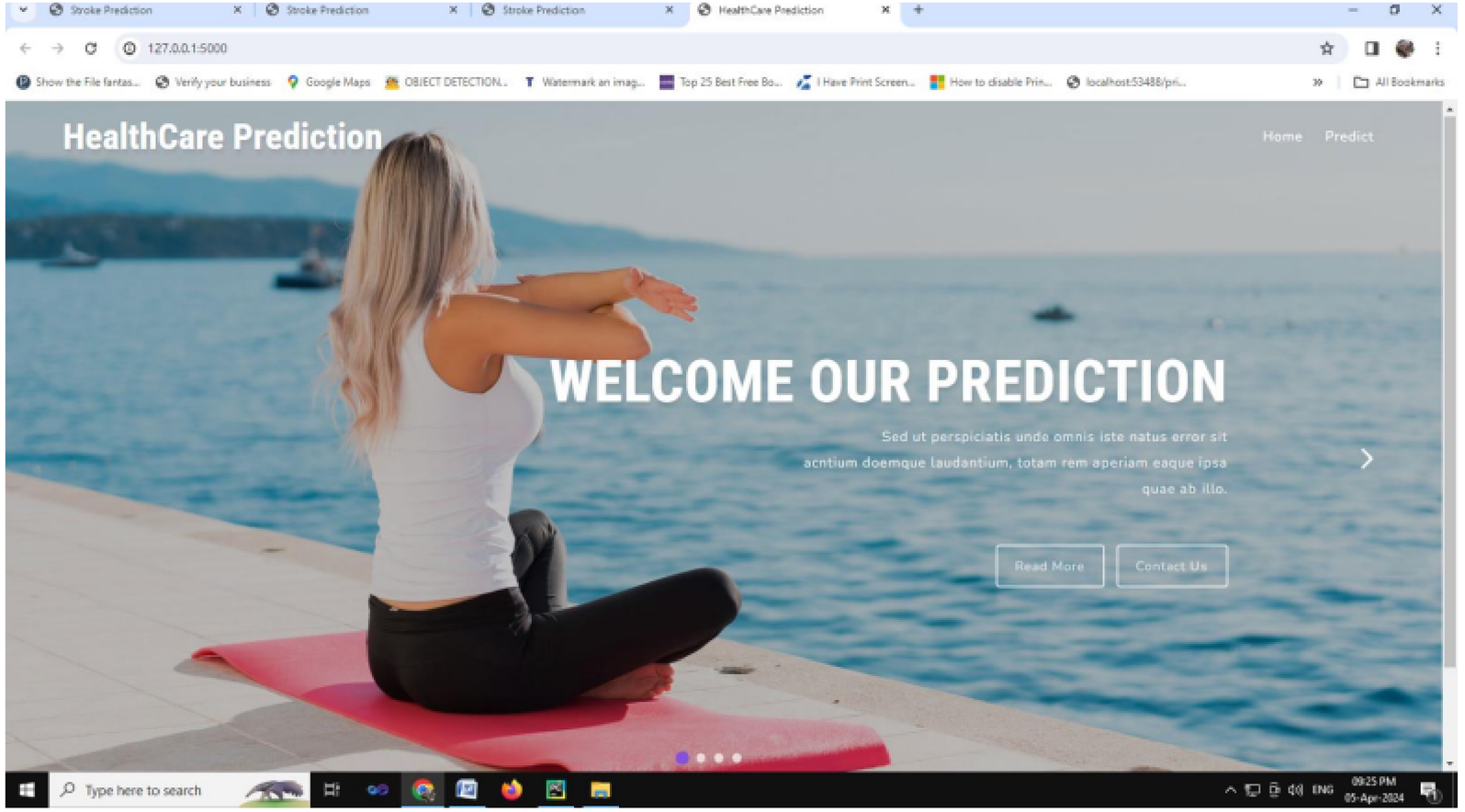
OVERALL DESIGN



PROCESS OF THE WORK



OUTCOMES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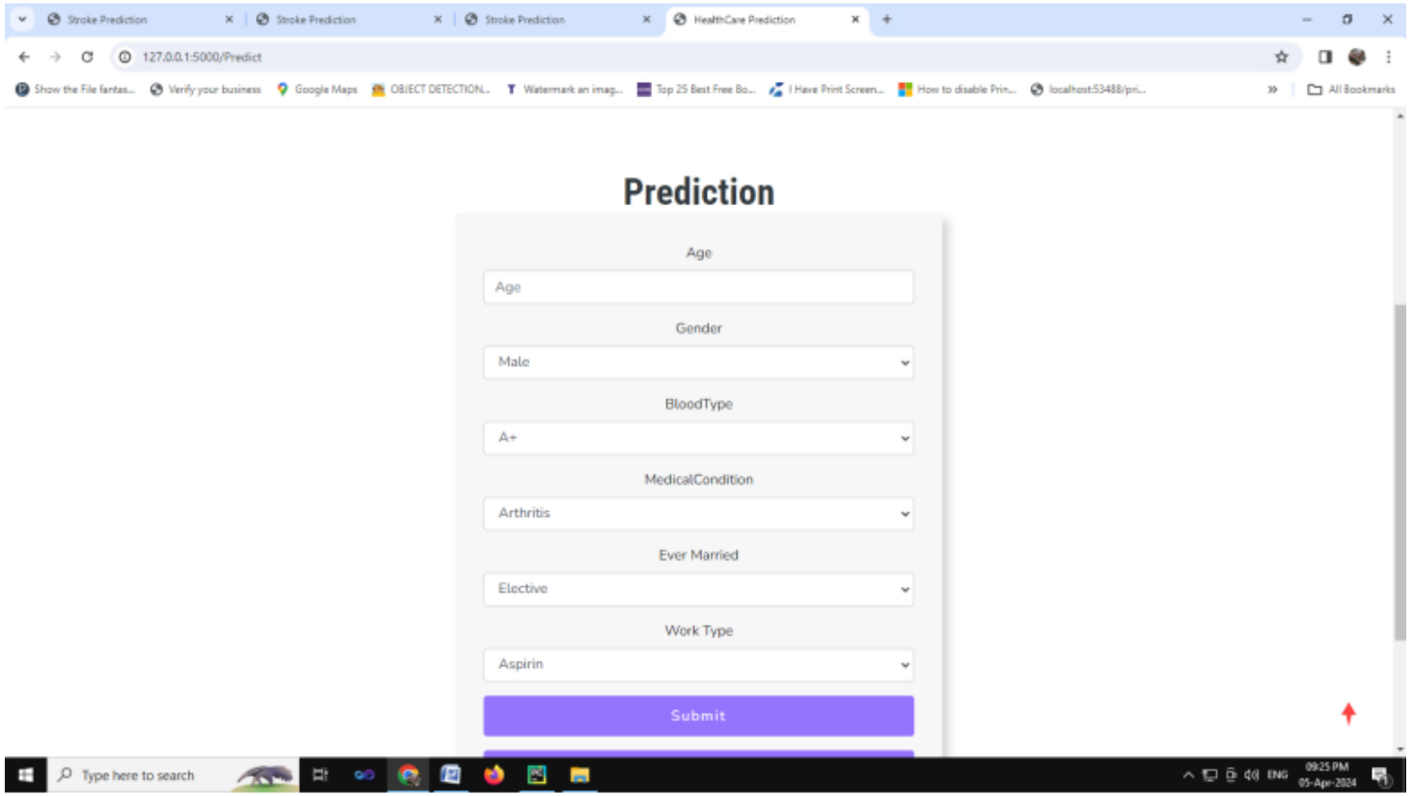
OUTCOMES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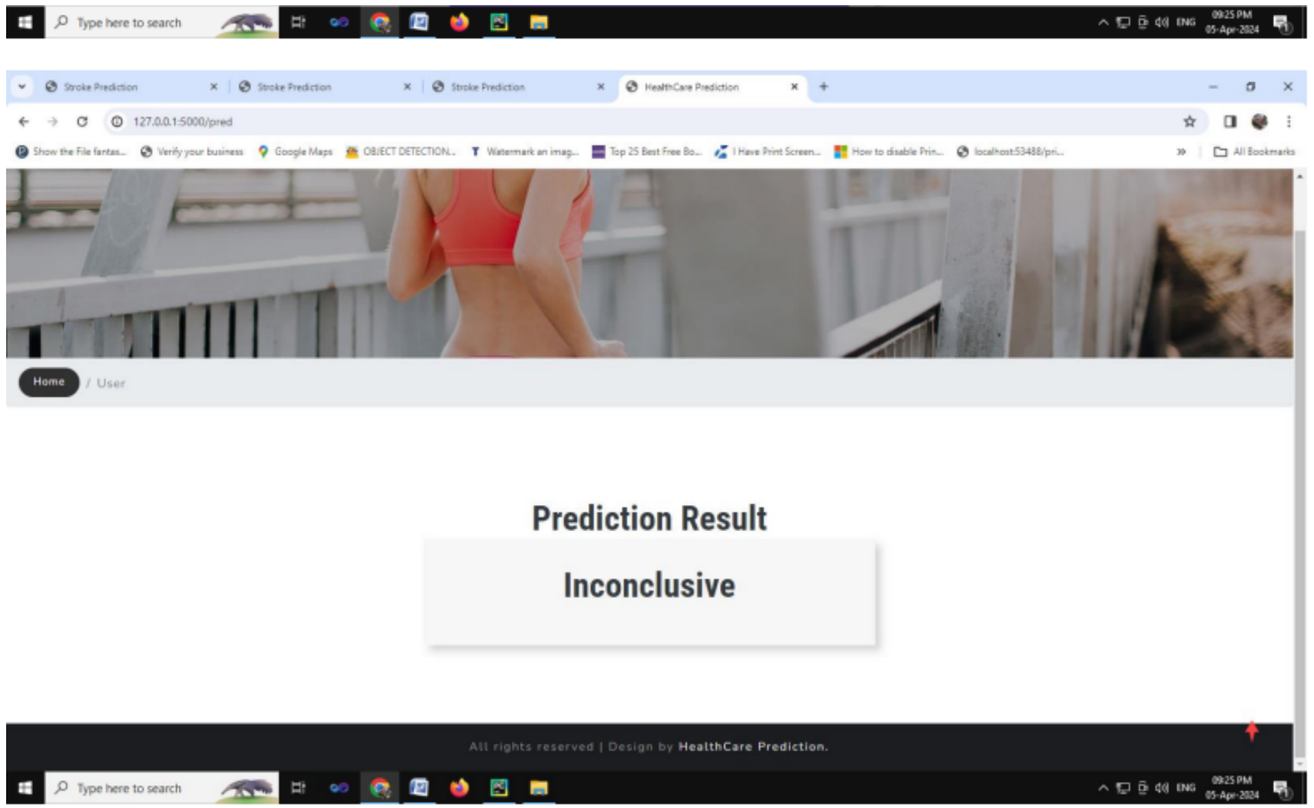
OUTCOMES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Stroke Prediction
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HealthCare Prediction
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CONCLUSION

- In conclusion, healthcare data analysis using machine learning algorithms holds immense promise for transforming the landscape of modern healthcare delivery.
- Throughout this study, we have explored the pivotal role of machine learning in leveraging vast and complex healthcare datasets to drive insights, inform decision-making, and improve patient outcomes.
- Machine learning algorithms have demonstrated their efficacy in a wide range of healthcare applications, including disease diagnosis, personalized treatment planning, predictive analytics, and healthcare operations optimization

THANK YOU

GITHUB LINK: https://github.com/Vignesh1234567890bunk/precisionmedicine?authuser=0