SURESH ANGADI EDUCATION FOUNDATION'S

ANGADI INSTITUTE OF TECHNOLOGY AND MANAGEMENT,BELAGAVI-590 009

DEPARTMENT OF ARTIFICIAL INTELLIGENCE AND DATA SCIENCE

Presentation on

"THYROID DISEASE PREDICTION USING MACHINE LEARNING APPROACHES"

GUIDED BY:

Prof . Chetan Patil

PRESENTED BY:

Miss Laxmi G

Miss Megha B

Miss Sahana

Miss Manali K

Contents:

- Introduction
- Literature Survey
- Problem Statement
- Objectives
- Methodology
- Advantages
- References

INTRODUCTION:

- Thyroid disorders affect millions worldwide, impacting metabolism and health.
- Early diagnosis is challenging due to overlapping symptoms.
- Machine learning offers data-driven solutions for enhanced diagnostic accuracy.
- This study evaluates ML techniques for thyroid disease prediction, improving detection and treatment planning.

Literature Survey:

- Machine learning algorithms have shown high accuracy in predicting thyroid disease: Studies have reported accuracy rates ranging from 95% to 100% using algorithms such as SVM, Random Forest, and Decision Trees.
- Ensemble methods can improve prediction performance: Combining multiple models through ensemble methods like bagging and boosting has been shown to enhance prediction accuracy and reduce errors.
- Feature selection and engineering are crucial for effective thyroid disease prediction: Selecting relevant features and using techniques like feature engineering can significantly impact the performance of machine learning models in predicting thyroid disease.

Problem Statement:

“Thyroid Disease Prediction Using Machine Learning Approaches”

OBJECTIVES:

- Develop an accurate machine learning model for predicting thyroid disease.
- Evaluate the model's performance using relevant metrics.
- Enable early detection and timely treatment of thyroid disease through effective prediction.

MACHINE LEARNING APPROACHES:

- **Random Forest**

1. Handles high-dimensional data effectively.

2. Improves prediction accuracy through ensemble approach.

- **Decision Tree**

1. Decision Trees provide easy-to-interpret results, allowing for clear understanding of feature importance.

2.Decision Trees can effectively handle categorical features, making them suitable for thyroid disease prediction.

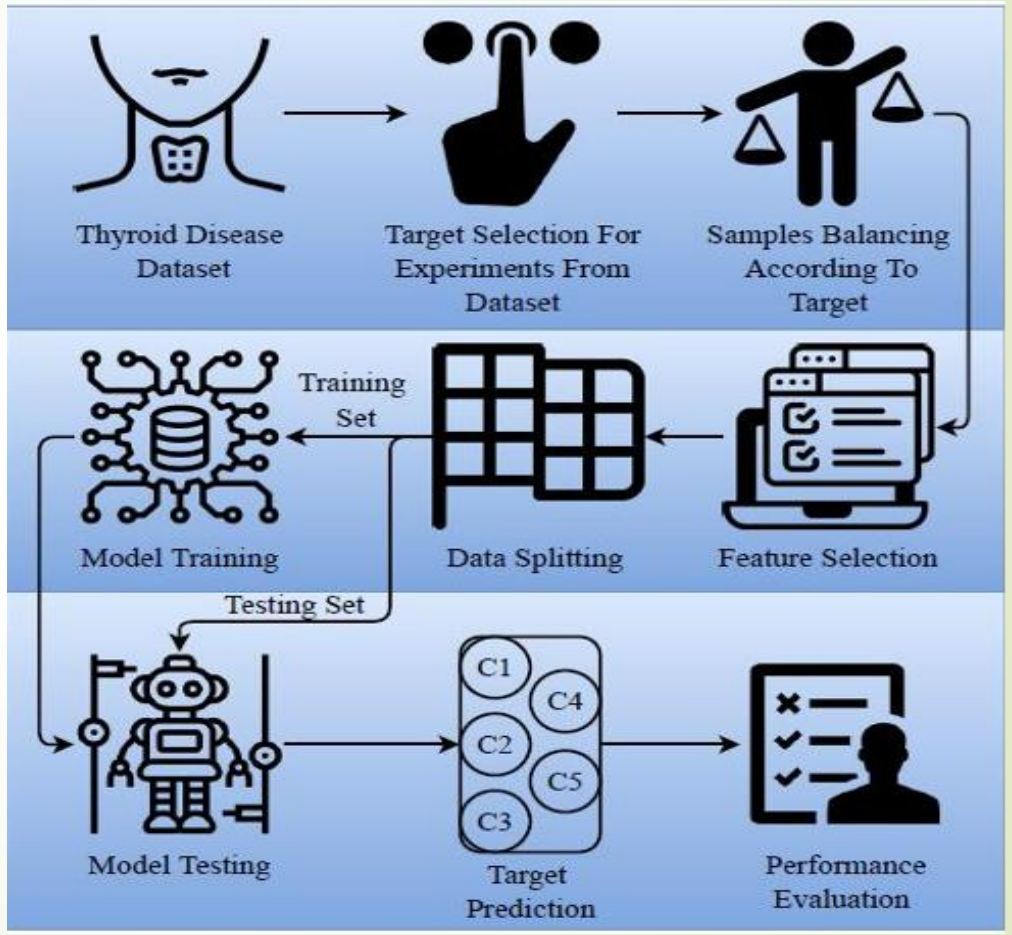
- **Support Vector Machine(SVM)**

1.SVM can effectively handle high-dimensional data, making it suitable for complex datasets.

2.SVM can provide accurate classification results, helping to distinguish between different thyroid disease classes.

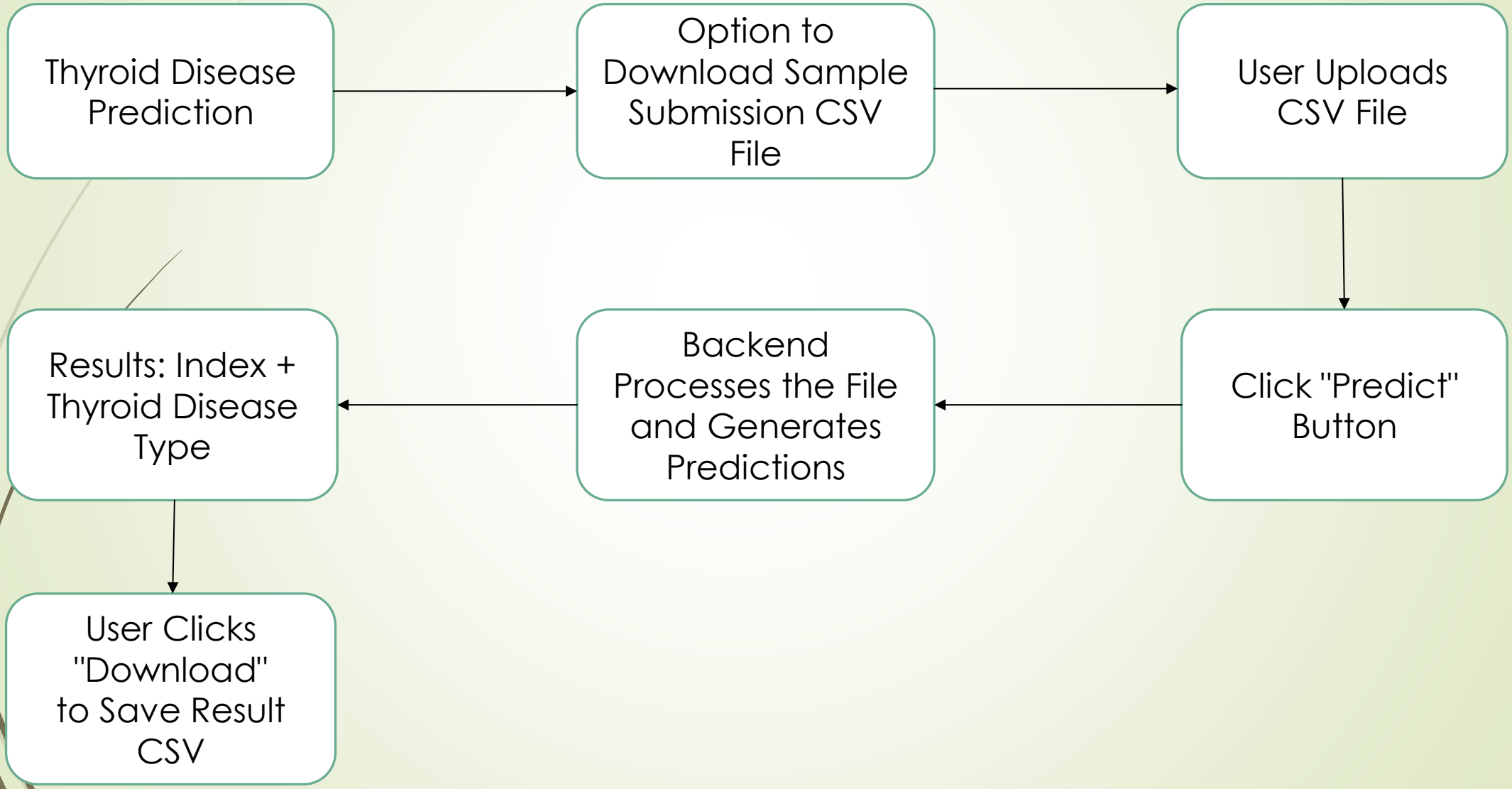
METHODOLOGY:

- A comprehensive dataset is collected from reliable sources and preprocessed to handle missing values and outliers.
- Feature selection is performed using filter, wrapper, and embedded methods to identify relevant features.
- Machine learning models such as Logistic Regression, Random Forest, and SVM are selected and trained.



CONTINUATION..

- Model performance is evaluated using accuracy, precision, recall, and F1-score.
- A user-friendly interface is designed for clinicians and patients to input data and receive predictions.
- The final model is validated and deployed for practical use in healthcare settings.


Thyroid Disease Prediction
Option to Download Sample Submission CSV File
User Uploads CSV File
Click "Predict" Button
Backend Processes the File and Generates Predictions
Results: Index + Thyroid Disease Type
User Clicks "Download" to Save Result CSV

ADVANTAGES:

- Early Detection: Machine learning enables early prediction of thyroid disease.
- Improved Accuracy: ML models provide high diagnostic accuracy.
- Personalized Treatment: Tailored predictions for individual patients.
- Reduced False Negatives: Minimized misdiagnosis and delayed treatment.
- Streamlined Decision-Making: Faster and more informed clinical decisions.
- Scalability: Applicable in resource-constrained settings.

REFERENCES:

- According to Kumar et al. (2023), machine learning algorithms can effectively predict thyroid disease.
- Chaganti et al. (2022) demonstrated the importance of selective features in thyroid disease prediction using machine learning techniques.
- Chaubey et al. (2021) explored various machine learning approaches for thyroid disease prediction, highlighting their potential in healthcare applications.

THANK YOU