Project Presentation

LIVER DISEASE RECOGNITION USING MACHINE LEARNING

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Introduction

The liver, the body's largest organ, performs vital metabolic functions and detoxification processes. Despite its significance, liver health often goes overlooked, leading to widespread liver issues globally. Utilizing machine learning models trained on extensive datasets like LPD can facilitate early detection of diseases such as Hepatitis, NAFLD, and ALD.

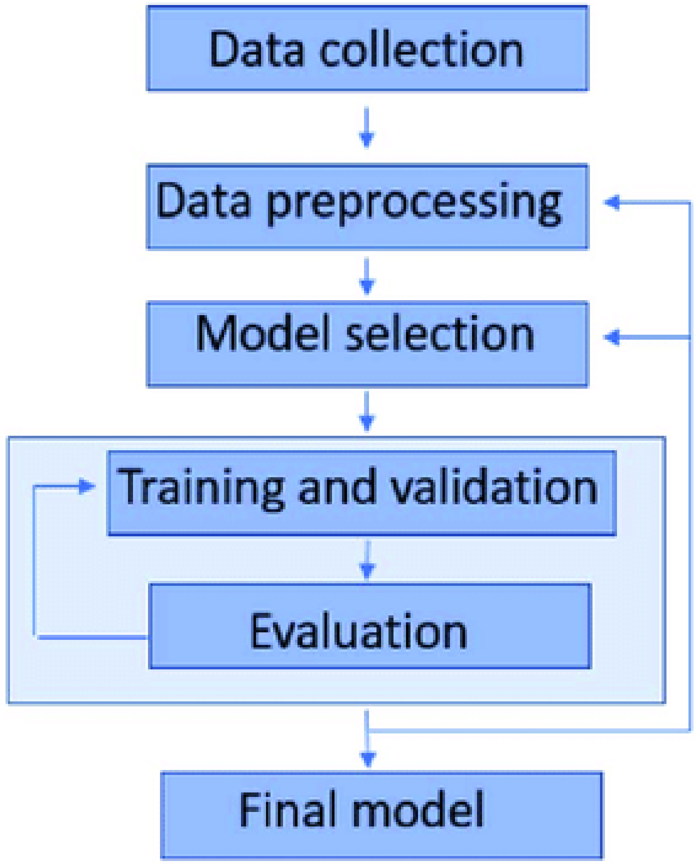
Problem Statement

Objective of this project is to develop a machine learning model that can accurately detect the presence of liver diseases in patients with the help of a pre-trained ML model.

Objectives

- **Early Detection**: Detect liver diseases in patients at an early stage to facilitate timely treatment.
- **Support Decision-Making**: Provide healthcare practitioners with valuable insights to aid in clinical decision-making.
- **Accurate Prediction** : Achieve accurate and reliable predictions to assist healthcare professionals in diagnosis.
- **Efficiency**: Improve the efficiency of the diagnosis process, potentially reducing healthcare costs and patient wait times.

Flowchart

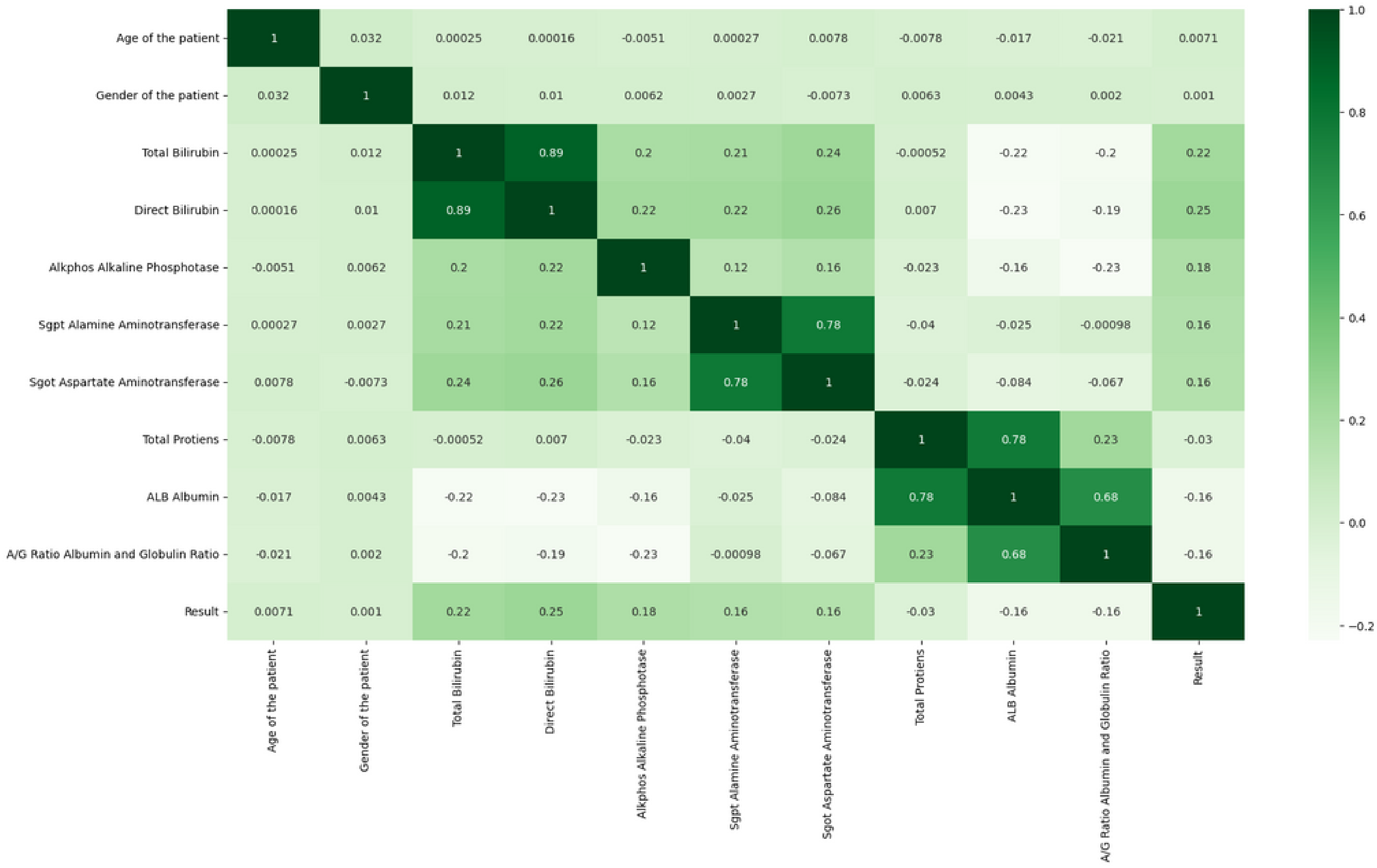

Data collection
Data preprocessing
Model selection
Training and validation
Evaluation
Final model

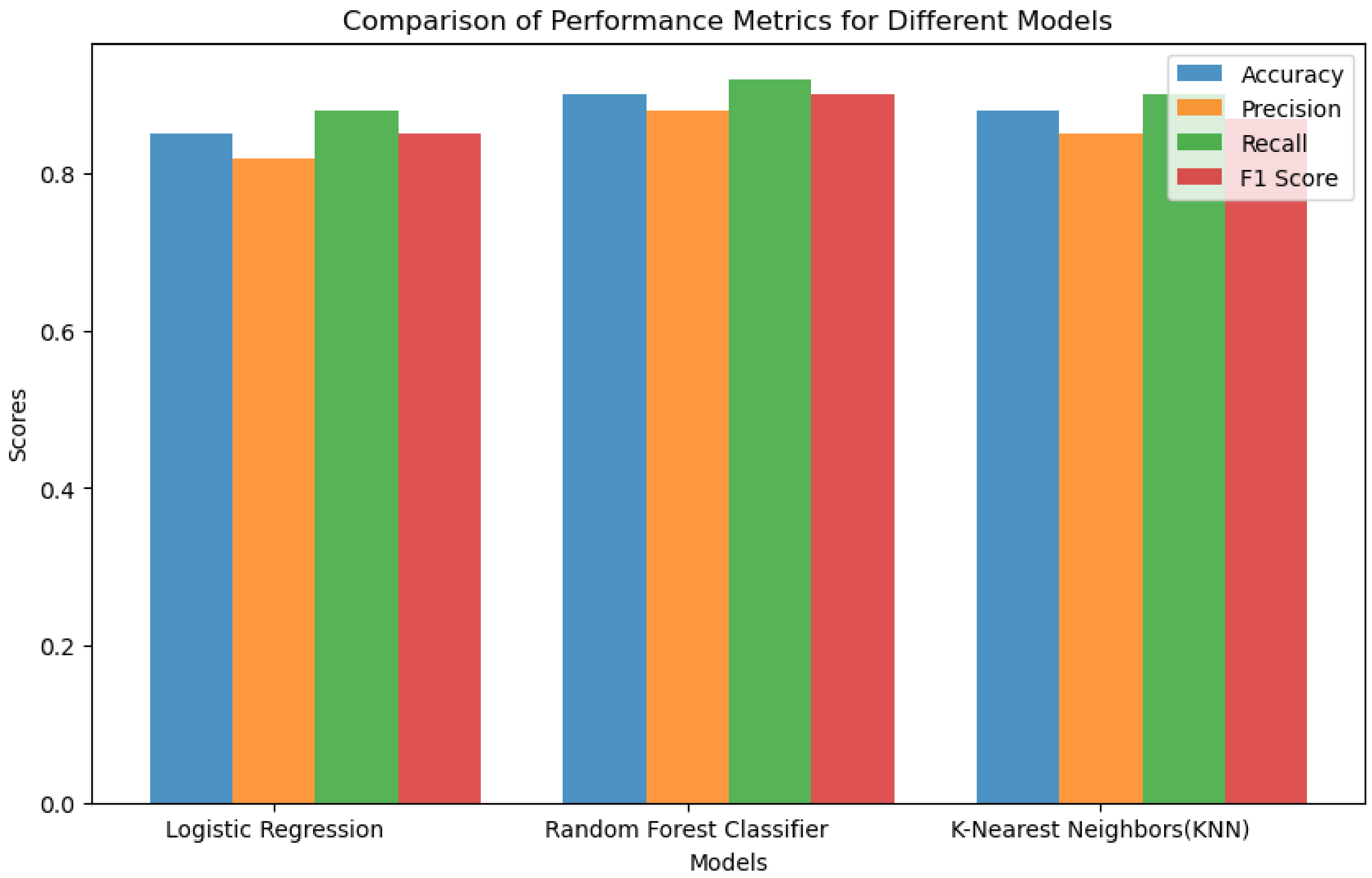
Concepts and Methods

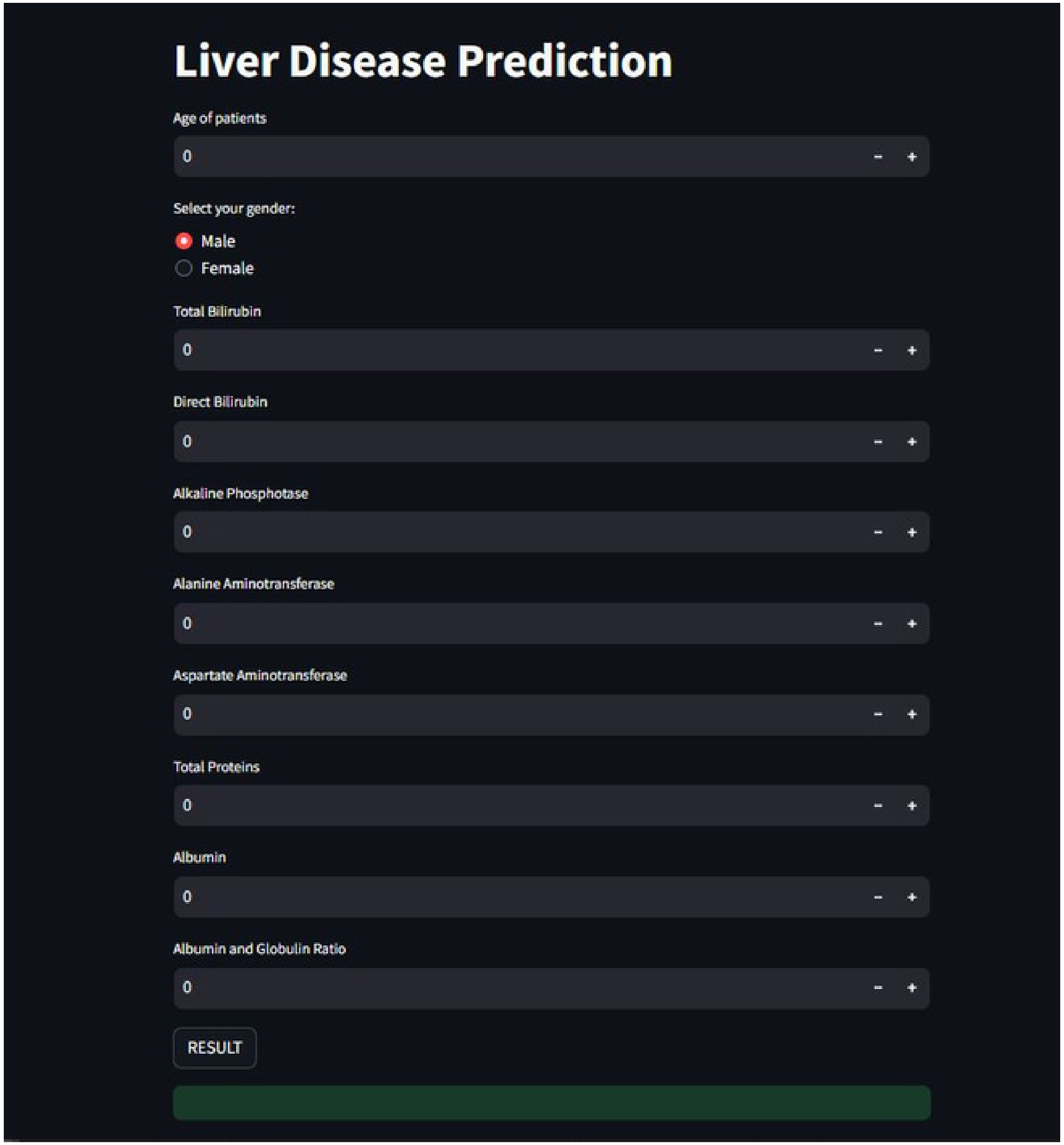
- **Data Collection**: Acquire a comprehensive dataset with patient demographics, medical history, liver function tests, and medical imaging (ultrasound, CT, MRI).
- **Preprocessing**: Clean and format the data for consistency and accuracy, handling missing values and outliers.
- **Model Selection**: Choose a suitable machine learning algorithm based on the nature of the task (classification, regression, etc.).
- **Model Training**: Train the selected algorithm on the labeled dataset to learn patterns and relationships.
- **Deployment**: Deploy the trained model in clinical environments after validation and testing.

Age of the	Gender of	Total Biliru	Direct Bilir	Alkphos A	Sgpt Alam	Sgot Aspar	Total Proti	ALB Albun	A/G Ratio
65	Female	0.7	0.1	187	16	18	6.8	3.3	0.9
62	Male	10.9	5.5	699	64	100	7.5	3.2	0.74
62	Male	7.3	4.1	490	60	68	7	3.3	0.89
58	Male	1	0.4	182	14	20	6.8	3.4	1
72	Male	3.9	2	195	27	59	7.3	2.4	0.4
46	Male	1.8	0.7	208	19	14	7.6	4.4	1.3
26	Female	0.9	0.2	154		12	7	3.5	1
29	Female	0.9	0.3	202	14	11	6.7	3.6	1.1
17	Male	0.9	0.3	202	22	19	7.4	4.1	1.2
55	Male	0.7	0.2	290	53	58	6.8	3.4	1
57	Male	0.6	0.1	210	51	59	5.9	2.7	0.8
72	Male	2.7	1.3	260	31	56	7.4	3	0.6
64	Male	0.9	0.3	310	61	58	7	3.4	0.9
74	Female	1.1	0.4	214	22	30	8.1	4.1	1
61	Male	0.7	0.2	145	53	41	5.8	2.7	0.87
25	Male	0.6	0.1	183	91	53	5.5	2.3	0.7
38	Male	1.8	0.8	342	168	441	7.6	4.4	1.3
33	Male	1.6	0.5	165	15	23	7.3	3.5	0.92
40	Female	0.9	0.3	293	232	245	6.8	3.1	0.8
40	Female	0.9	0.3	293	232	245	6.8	3.1	0.8
51	Male	2.2	1	610	17	28	7.3	2.6	0.55

CORELATION MATRIX




Comparison of Performance Metrics for Different Models
Accuracy
Precision
Recall
F1 Score
Scores
0.0
0.2
0.4
0.6
0.8
Logistic Regression
Random Forest Classifier
K-Nearest Neighbors(KNN)
Models


Liver Disease Prediction
Age of patients
0
Select your gender:
Male
Female
Total Bilirubin
0
Direct Bilirubin
0
Alkaline Phosphotase
0
Alanine Aminotransferase
0
Aspartate Aminotransferase
0
Total Proteins
0
Albumin
0
Albumin and Globulin Ratio
0
RESULT

Conclusion

In conclusion, the development of a liver disease recognition model using Random Forest demonstrates the potential to assist healthcare professionals in diagnosing liver diseases. The models have been trained and evaluated, providing valuable insights into their performance.

Future Scope

- Application Development to connect patients to doctors.
- Exploring advanced feature engineering.
- Real-time monitoring.
- Continuous research and staying updated with healthcare .

References

[1] A framework for identification and classification of liver diseases based on machine learning algorithms.
Huanfei Ding, Muhammad Fawad, Xiaolin Xu, corresponding and Bowen Hu corresponding.

[2] 2017 Int. Conf. Compute. Appl. ICCA 2017 299–305
Pasha M and Fatima M 2017
Comparative Analysis of Meta Learning Algorithms for Liver
Disease Detection J. Softw. 12 923–33

[3] Abdar M, Yen N Y and Hung J C S 2018 Improving the Diagnosis of Liver Disease Using
Multilayer Perceptron Neural Network and Boosted Decision Trees J. Med. Biol. Eng. 38 953–65

[4] Banu Priya M, Laura Juliet P and Tamilselvi P R 2018
Performance Analysis of Liver Disease Prediction Using
Machine Learning Algorithms Int. Res. J. Eng. Technol. 5 206–11

Thank You