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AI-Based Lung Cancer Prediction Using Machine Learning

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Abstract- Lung cancer is one of the leading causes of death worldwide. Early detection can significantly improve survival rates. This project proposes an AI-based lung cancer prediction system using machine learning algorithms. The system analyzes medical data to predict whether a patient is likely to have lung cancer. Various algorithms such as Random Forest and Support Vector Machine are used. The model is trained and tested on a dataset to achieve high accuracy. The system also provides a user-friendly dashboard for predictions. The results demonstrate that machine learning can effectively assist in early detection of lung cancer.

Keywords- Artificial Intelligence, Machine Learning, Lung Cancer, Prediction, Healthcare

I. INTRODUCTION

Lung cancer is a serious disease that affects millions of people globally. Early diagnosis is crucial for effective treatment. Traditional diagnostic methods can be time-consuming and expensive. With advancements in artificial intelligence, machine learning models can assist doctors in predicting diseases quickly and accurately. This project focuses on developing a predictive model for lung cancer detection.

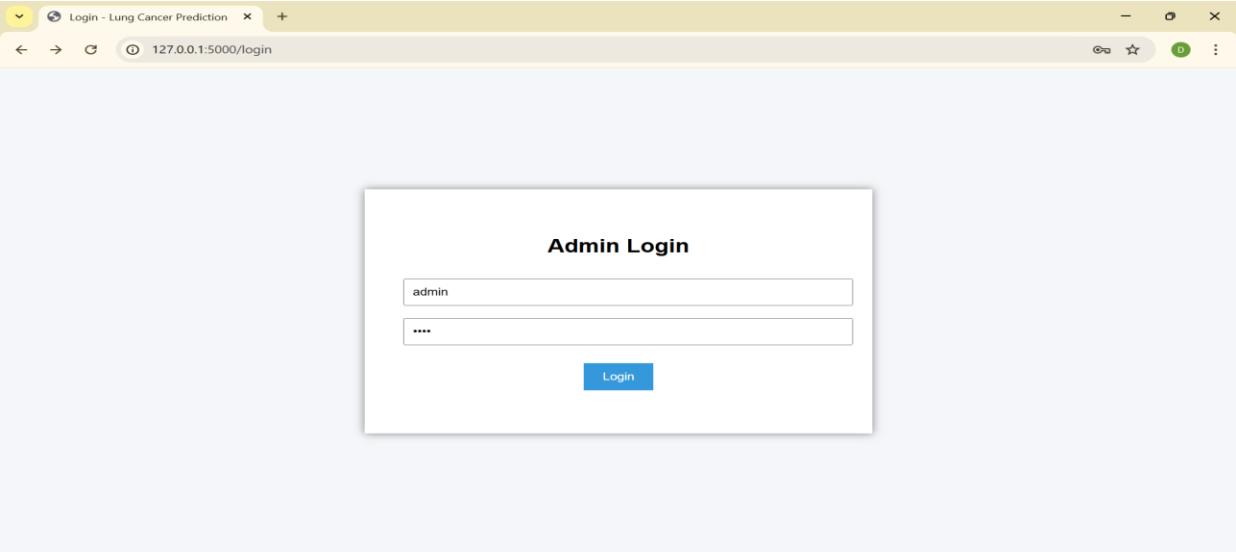
II. METHODOLOGY

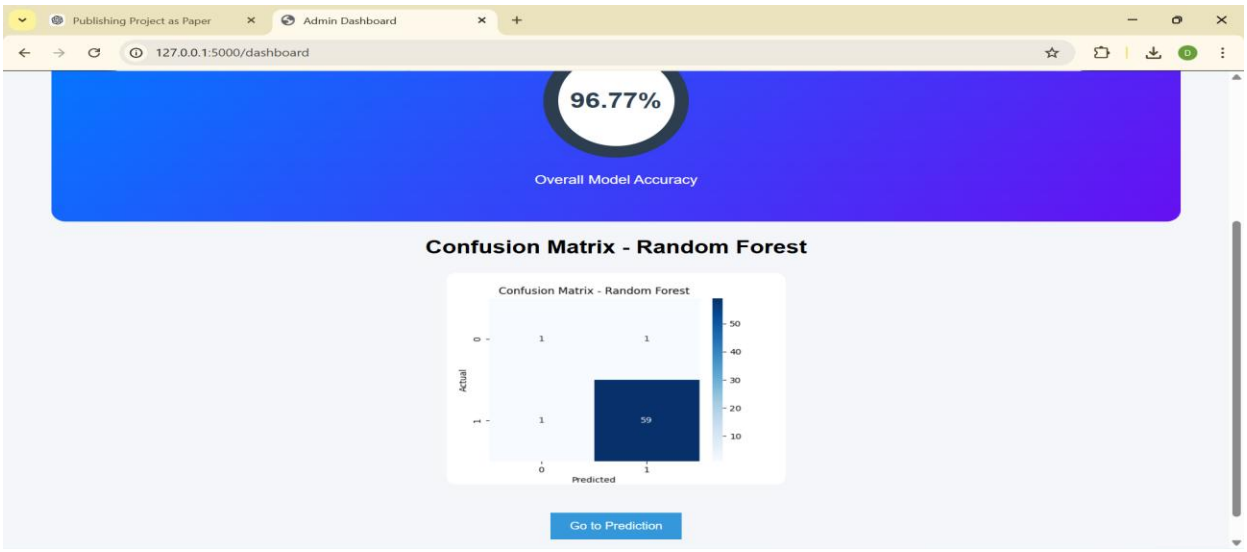
The system follows a structured machine learning pipeline. First, the dataset is collected and preprocessed by handling missing values and encoding categorical data. Then, feature selection is performed to identify important attributes. Machine learning algorithms such as Random Forest and Support Vector Machine are applied. The dataset is split into training and testing sets. The model is trained and evaluated using performance metrics such as accuracy and confusion matrix.

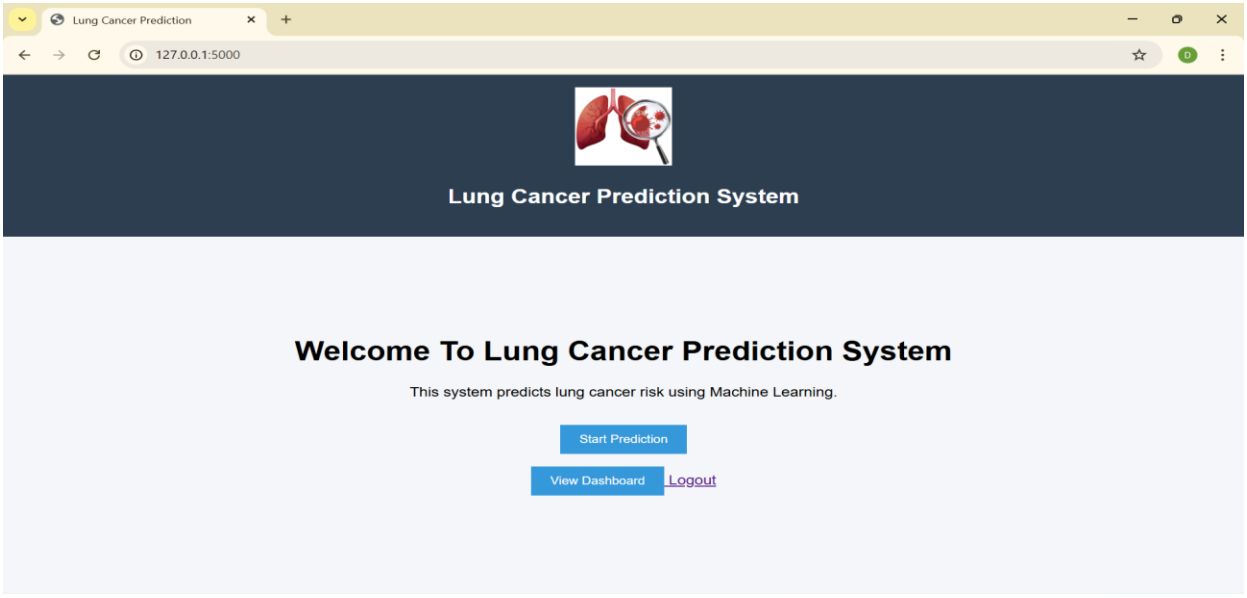
III. RESULTS

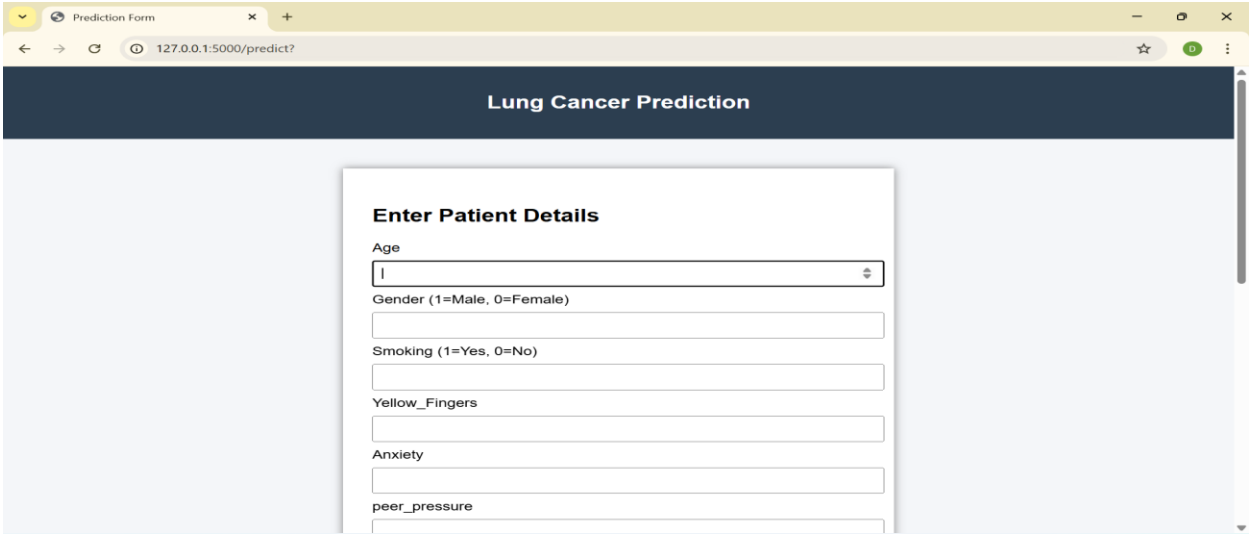
The model achieved an accuracy of approximately 90% in predicting lung cancer. The confusion matrix shows a good balance between true positives and true negatives. The system also provides a visual dashboard displaying prediction results and performance metrics. These results indicate that the model is effective in assisting early diagnosis.

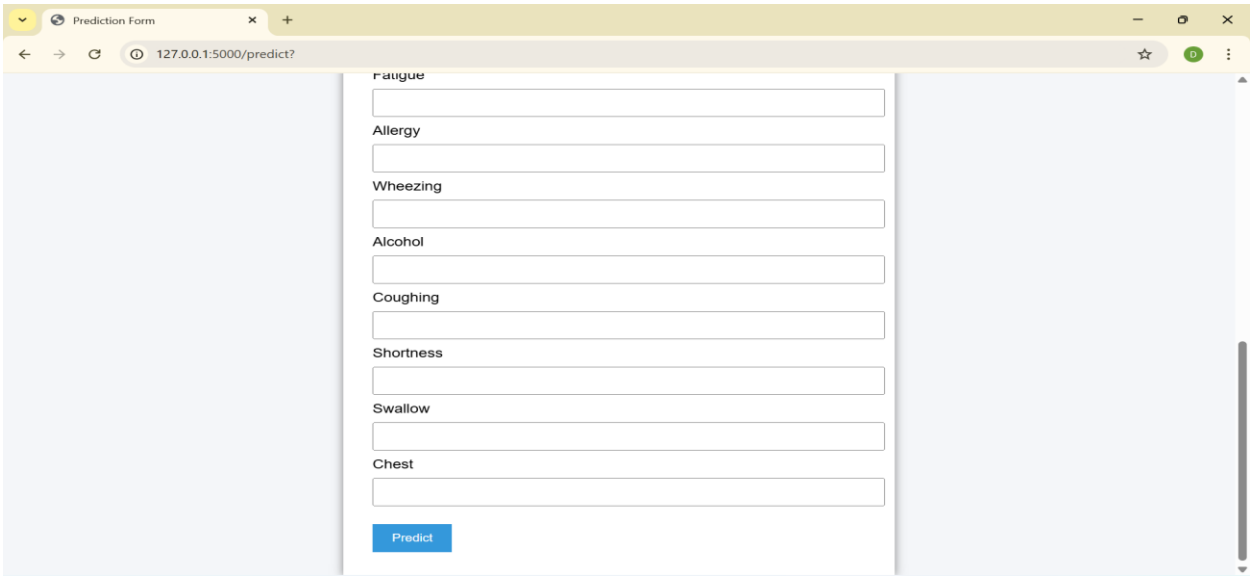
IV.OUTPUT (SCREENSHOTS)

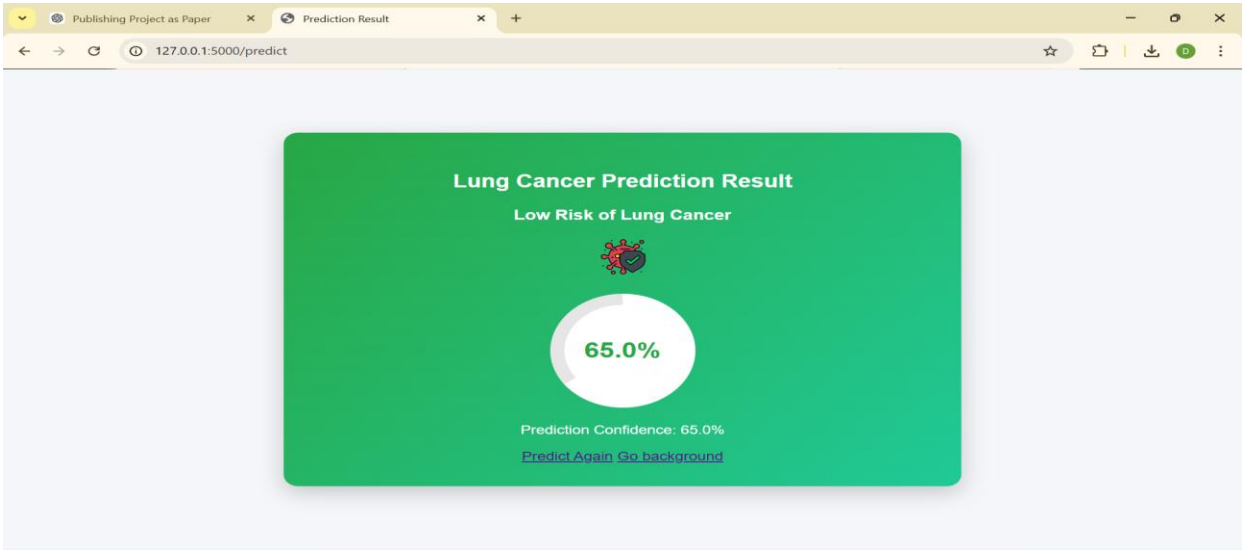


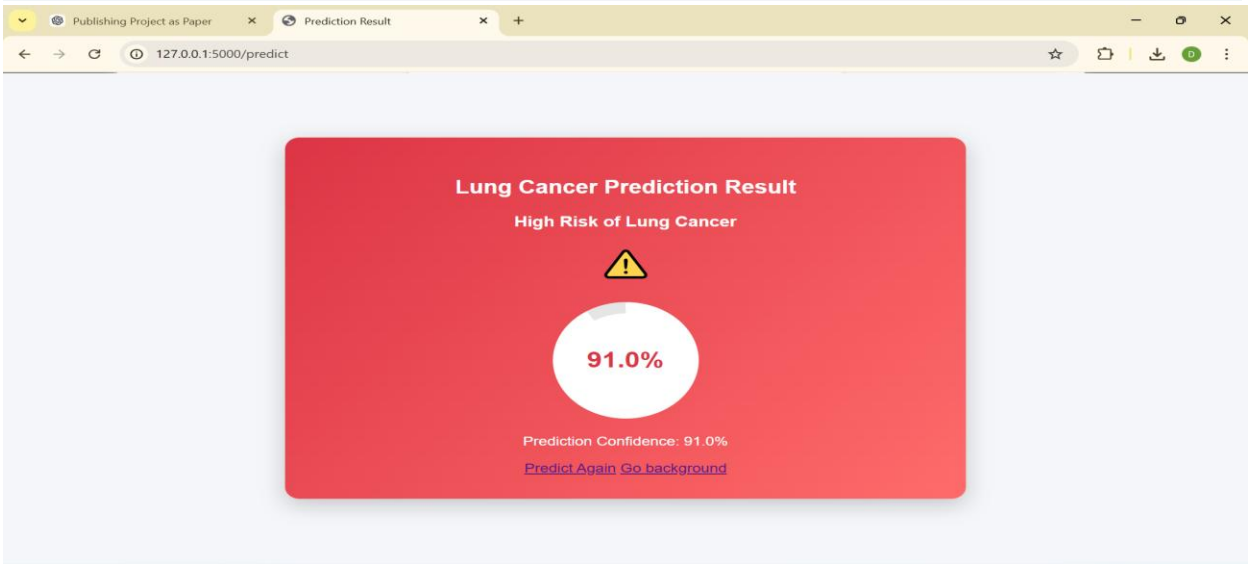

Publishing Project as Paper
Admin Dashboard
127.0.0.1:5000/dashboard
96.77%
Overall Model Accuracy
Confusion Matrix - Random Forest
Confusion Matrix - Random Forest
Actual
Predicted
Go to Prediction


Lung Cancer Prediction
127.0.0.1:5000
Lung Cancer Prediction System
Welcome To Lung Cancer Prediction System
This system predicts lung cancer risk using Machine Learning.
Start Prediction
View Dashboard
Logout


Prediction Form
127.0.0.1:5000/predict?
Lung Cancer Prediction
Enter Patient Details
Age
Gender (1=Male, 0=Female)
Smoking (1=Yes, 0=No)
Yellow_Fingers
Anxiety
peer_pressure


Prediction Form
127.0.0.1:5000/predict?
Fatigue
Allergy
Wheezing
Alcohol
Coughing
Shortness
Swallow
Chest
Predict


Publishing Project as Paper
Prediction Result
127.0.0.1:5000/predict
Lung Cancer Prediction Result
Low Risk of Lung Cancer
65.0%
Prediction Confidence: 65.0%
Predict Again Go background


Publishing Project as Paper
Prediction Result
127.0.0.1:5000/predict
Lung Cancer Prediction Result
High Risk of Lung Cancer
91.0%
Prediction Confidence: 91.0%
Predict Again Go background

V. CONCLUSION

This project demonstrates the potential of machine learning in healthcare applications. The AI-based lung cancer prediction system can help doctors make faster and more accurate decisions. Future improvements can include using deep learning models and larger datasets to enhance performance.

REFERENCES

[1] World Health Organization, 'Lung Cancer Statistics'.
[2] Research papers on machine learning in healthcare.
[3] Scikit-learn documentation.