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AI Doctor Symptom Checker with Recommendation

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ABSTRACT

The rising demand for accessible and intelligent healthcare solutions highlights the need for systems that can analyze patient symptoms in real time and provide reliable recommendations. This paper presents the development of AI Doctor – Symptom Checker with Recommendation, a web- based platform powered by machine learning for early symptom analysis the health advice. The application integrates secure authentication, personalized dashboards and AI-driven prediction models. Built using Python (Flask) for the backend and HTML/CSS/JavaScript for the frontend, the system ensures responsiveness, usability, and accuracy. Result confirms correct disease prediction, user-friendly interaction, and secure data handling. Compared to traditional symptom checkers, the system offers higher engagement, structured recommendations, and potential for AI- driven personalization.

KEYWORDS *Machine Learning, Symptom Checker, Disease Prediction, Random Forest Classifier, Gradient Boosting, Health Recommendation System.*

INTRODUCTION

The AI-Doctor project fills this gap by providing an easily accessible, quick, and data-driven tool for initial health checks. In many parts of the world, access to healthcare facilities is limited due to geographical, financial, or infrastructural constraints. People often ignore early symptoms of diseases due to a lack of awareness or fear of visiting hospitals. The rapid

advancement of Artificial Intelligence (AI) has opened new possibilities in the field of healthcare, particularly in early diagnosis and patient support. AI-Doctor is a web-based intelligent medical consultation system that helps users identify potential diseases based on the symptoms they experience. The goal is not to replace professional doctors, but rather to provide an initial assessment that can guide users toward timely medical attention. It is critical to have access to health information in the current digital era. The requirement for a trustworthy, approachable tool to assist people in better understanding their symptoms is addressed by this initiative. The AI Doctor web application processes symptom data and offers informed health insights using a complex AI model. The approach emphasizes the value of speaking with a healthcare provider and is intended to serve as a preliminary guidance rather than a substitute for a professional diagnosis. To improve the user experience, it has a dashboard for personal health history, user authentication, and a responsive interface.

LITERATURE REVIEW

Recent years I explored some related papers to AI Doctor – Symptom checker with Recommendation in that I got some limitations. To check papers, I studied recent papers. In the first paper Artificial Intelligence-based Symptom Checkers for Disease Diagnosis (2025) by Amornphong Suksen and Dineth Nok evaluates the current evidence on AI symptom checkers for disease diagnosis, examining their effectiveness across multiple dimensions through a comprehensive search of PubMed, SCOPUS, and Sage Journals for studies published between 2020 and 2025. Evaluating the Diagnostic Performance of Symptom Checkers (2024) by Mohammad Hammoud, Shahd Douglas, Mohamad Darmach, Sara Alawneh, Swapnendu Sanyal, Yue You, Renkai Ma, and Xinning Gui assesses the accuracy of several symptom checkers using standardized methods, highlighting substantial performance variation and emphasizing AI's potential to improve diagnostic capabilities. Additionally, the review User Experience of Symptom Checkers: A Systematic Review (2022) by Yue You, Renkai Ma, and Xinning Gui analyzes user experience across 31 studies, focusing on aspects such as motivation, trust, acceptability, satisfaction, accuracy, usability, safety, and functionality, and suggests that future symptom checkers should enhance accuracy, safety, and usability.

RELATED WORK

In this Project Used AI Doctor Symptom Checker with Recommendation through the integration of medical knowledge bases, machine learning algorithms, and natural language processing to assist users in identifying possible diseases. Early systems like WebMD, Ada Health, and Buoy Health used rule-based approaches, providing basic condition suggestions but lacking accuracy, personalization, and adaptability. With advancements in machine

learning, models such as Decision Trees, Naive Bayes, and Random Forest were introduced to analyze symptom patterns, while ensemble and deep learning methods further improved prediction performance Some platforms also integrated cloud-based services for scalability and real- time access. However, these systems still face limitations such as language barriers, lack of regional disease coverage, privacy concerns, and limited transparency of predictions. To address these challenges, the proposed AI Doctor system incorporates ensemble machine learning models, an intuitive web interface, and secure data handling to deliver accurate, personalized health recommendations, making it more efficient, user- friendly, and adaptable than existing solutions.

EXISTING METHOD

Existing symptom checker systems such as WebMD, Ada Health, and Buoy Health primarily use rule-based or decision-tree- based approaches to match user-entered symptoms with predefined medical conditions. These platforms often rely on static medical databases that do not adapt to new diseases or changing symptom patterns, leading to limited accuracy. Most existing systems provide only generalized outputs without considering user- specific factors like age, gender, medical history, or lifestyle. Some platforms use basic AI models, but they lack continuous learning and advanced analytics, which reduces the quality of predictions. Many current solutions also require high-speed internet or paid subscriptions, making them inaccessible to users in rural or low-resource regions. Another drawback is the lack of transparency in how predictions are made, which reduces user trust. Most systems do not prioritize data privacy and security, causing concerns about sharing sensitive health information. These limitations highlight the need for a more accurate, secure, user-friendly, and intelligent system like the proposed AI Doctor.

PROPOSED METHOD

The proposed AI Doctor system uses machine learning-based disease prediction to overcome the limitations of traditional rule- based symptom checkers. It employs an ensemble of algorithms such as Random Forest, Gradient Boosting, and Voting Classifier to analyze multiple symptoms and improve accuracy. User-entered symptoms are preprocessed through text cleaning, synonym mapping, and encoding to generate structured input for the model. A responsive web interface built using Flask, HTML, CSS, and JavaScript allow users to easily enter symptoms and receive results on any device. The backend securely handles user authentication, stores health history in a database, and provides personalized recommendations along with predicted diseases. Unlike existing systems, it offers precautionary advice and supports low- bandwidth environments for wider accessibility. The

modular design allows future integration of multilingual support, voice input, telemedicine, and wearable health devices. Overall, the proposed method delivers a more accurate, user-friendly, secure, and scalable AI-based healthcare solution.

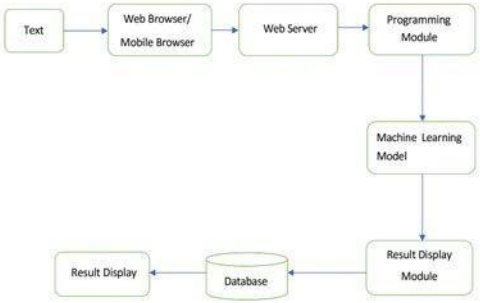

Figure1: Architecture of the System

METHODOLOGY DESCRIPTION

The AI Doctor Symptom Checker with Recommendation system follows a structured, modular methodology to ensure accurate predictions and smooth data flow between all components. The architecture describes how user inputs are processed, analyzed, and converted into meaningful health insights through multiple interconnected modules.

User Interaction: The user accesses the AI Doctor platform through a web or mobile browser and enters symptoms using a simple interface.

Inputs can be typed or selected from a predefined list for accuracy. The data is then securely transmitted to the server for further analysis.

Web Server: The web server acts as a bridge between the user interface and backend modules. It validates user inputs, manages requests, and securely transfers data for processing. This ensures reliable communication and safe handling of sensitive medical information.

Preprocessing Module: The preprocessing module cleans and prepares symptom data for model analysis. It removes irrelevant details, standardizes terms, and converts text into numerical form. This step ensures the data is consistent with the trained machine learning model.

Machine Learning Model: The processed data is analyzed using ensemble algorithms such as Random Forest, Gradient Boosting, and Voting Classifier. The model predicts the most probable diseases and assigns confidence scores. It improves accuracy through training on diverse medical datasets. **Result Display Module:** The result display module organizes the model's output into a readable format for users. It lists recognized symptoms, predicted diseases, and precautionary measures. A disclaimer is shown to remind users that the tool

provides advisory support, not a diagnosis.

Database Management: The database securely stores user details, symptom-disease mappings, and prediction history. It supports data retrieval for future use and model retraining. Strong encryption ensures privacy and protection of sensitive health information.

Result Display to User: The analyzed results are presented to the user through an interactive interface. The output includes possible diseases, confidence levels, and recommendations. This immediate feedback helps users make informed decisions about seeking medical care.

RESULTS AND DISCUSSION

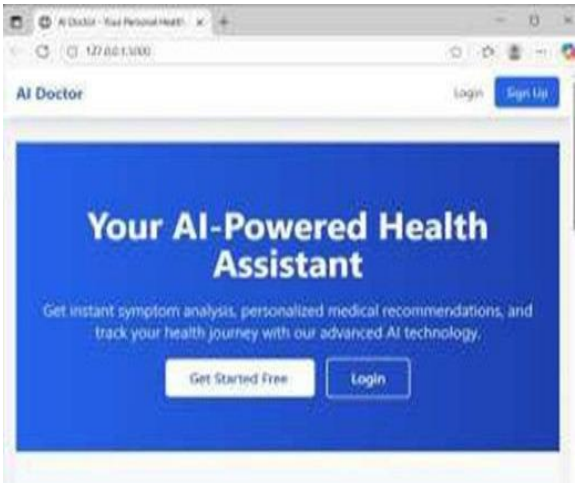

Figure2: Home Page

The homepage of the AI Doctor – Your Personal Health Assistant provides a clean and intuitive interface for easy user navigation. It highlights key features such as instant symptom analysis, personalized recommendations, and AI-powered health tracking. A navigation bar offers quick access to Login and Sign-Up options, while clear call-to-action buttons encourage engagement. The professional blue-themed design ensures readability and builds user trust. Being fully responsive, it adapts seamlessly across all devices and serves as the main gateway to other system features.

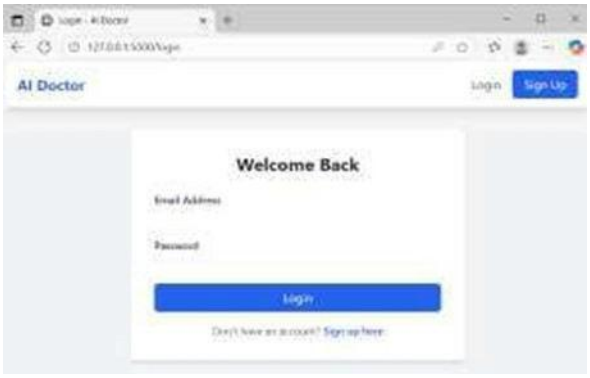

Figure3: Login Page

The Login Page of the AI Doctor platform offers a secure and user-friendly interface for registered users to access their accounts. It features a simple layout with input fields for email and password, along with a clear "Login" button for quick access. The design maintains consistency with the homepage and ensures smooth navigation across devices. Integrated with the authentication backend, it validates user credentials and secures sessions. Upon successful login, users are redirected to their personalized dashboard.

Figure4: Symptom Checker Page The Symptom Checker page is the core feature of the AI Doctor platform, helping users identify possible health conditions based on their symptoms. It includes quick navigation options for Dashboard, History,

and Logout to enhance usability. Users can enter symptoms in an interactive input field that provides smart suggestions for accuracy. The page encourages detailed inputs like main symptoms, duration, and severity. This structured design ensures precise symptom analysis and reliable AI-driven predictions.

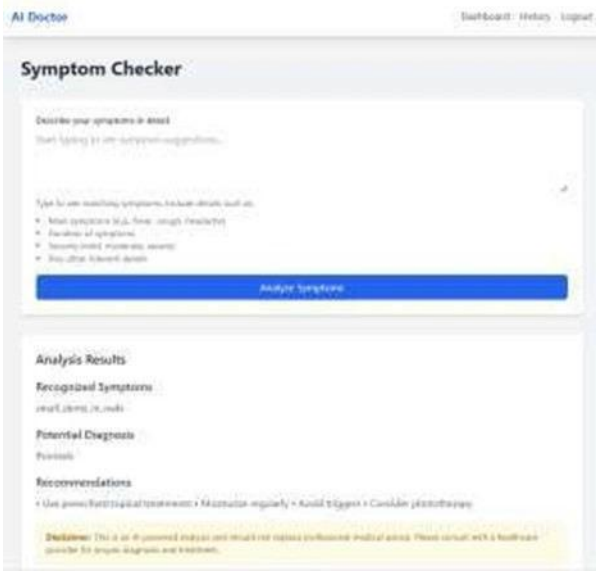

Figure5: Symptom Checker Page with Analysis Results

The Symptom Checker lets users enter detailed health symptoms for AI

analysis. Users are guided to include main symptoms, duration, severity, and other relevant details. After clicking "Analyze Symptoms," results show under "Analysis Results," including recognized symptoms, potential diagnoses, and recommendations. Recommendations offer treatment tips, preventive measures, and lifestyle guidance.

CONCLUSION

The Symptom Checker project provides an intuitive platform for users to input health symptoms and receive AI-powered insights.

It effectively identifies key symptoms, suggests potential diagnoses, and offers actionable recommendations, improving awareness and early intervention.

FUTURE SCOPE

Future improvements could include integrating real-time telemedicine support, expanding the symptom database for greater accuracy, incorporating personalized health tracking, and enabling multilingual support for wider accessibility.

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