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MediSphere: AI-Driven Diagnostics with Precision Scoring and Therapeutic Intelligence

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Abstract: Medisphere is an AI-powered web-based platform designed to enhance diagnostic accuracy and support clinical decision-making through precision scoring. The platform utilizes advanced machine learning models, trained on a wide range of medical datasets, to interpret patient symptoms, clinical history, and diagnostic test outcomes. By producing a diagnostic precision score, Medisphere supports healthcare professionals in assessing the probability of particular conditions, minimizing diagnostic errors, and enhancing patient care. The website integrates an intuitive user interface for physicians and medical staff, enabling seamless data input, visualization of diagnostic insights, and comparative analysis with standard clinical guidelines. Medisphere's AI-driven scoring framework aims to act as a supportive tool rather than a replacement for medical expertise, providing transparent, ex- plainable insights that augment physician judgment. Ultimately, the project demonstrates the transformative role of AI in healthcare by combining scalability, precision, and accessibility to advance early detection, personalized treatment, and overall diagnostic efficiency.

Keywords: Medisphere, AI-powered healthcare, diagnostic ac- curacy, precision scoring, ma chine learning models, clinical decision support, personalized treatment.

I. INTRODUCTION

Healthcare system now a day collect a large amount of patient data. This includes symptoms, medical history and many test reports. Checking all this data manually takes a lot of time. It is difficult for doctors to study every detail carefully when the number of patients is high. Because of this, computer-based systems are now used in healthcare to support doctors. These systems help in improving diagnosis accuracy and reducing decision time [1], [8].

MediSphere is a smart healthcare platform developed to support disease diagnosis and treatment planning. The system checks patient details like symptoms, past medical history, and clinical records. After looking at this information, it predicts possible diseases at an early stage. Finding diseases early helps doctors begin treatment faster and improve the patient's health [1], [2], [3].

One important feature of MediSphere is its precision-based diagnosis. Along with the predicted disease and the system gives a precision score. This score shows how confident the system is about the result. Doctors can check this score before deciding the next medical step. This makes the system useful in real hospital situations [4].

MediSphere also includes a skin disease detection module. Users can upload images of affected skin areas. The system studies these images using image processing methods. It de- tects common skin problems such as acne, eczema, psoriasis, fungal infection, and skin cancer. Early detection of skin disease helps in preventing serious complications [3], [8], [9]. In addition to diagnosis, MediSphere gives treatment sug- gestions. These suggestions are based on the patient's symp- toms and medical history. The system provide basic treatment steps, safety advice and feedback. This helps to patients understand what to do next [5].

A chat support feature is also included in the system. It helps users while entering symptoms and explains the results in simple language. This makes the platform easy to use [9].

MediSphere also provides a nearby hospital finder. It helps users locate hospitals and clinics based on their location. Secure login and authentication are used to protect patient data and maintain privacy according to healthcare standards [7].

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Overall, MediSphere combines disease prediction, skin de- tection, treatment support, chat assistance, and hospital loca- tion services in one platform. The system support doctors in make better decisions and helps to improve patient care in a simple and effective way [1], [3], [8].

II. RELATED WORK

Many studies have explor how computer based systems can be use in medical diagnosis and healthcare management. [1] developed a system for neurological disease diagnosis and per- sonalized treatment. Their study showed that machine learning models can improve prediction accuracy. The performance of this system is usually measured using accuracy, which is calculated as:

$$Accuracy = \frac{\text{Number of Correct Predictions}}{\text{Total Number of Cases}} \quad (1)$$

This formula show how the system predicts diseases correctly. Their work explains how patient data and intelligent systems can support doctors in making better medical decisions.

Tanaka et al. [2] proposed a machine learning method for analyzing biomedical data for drug discovery. Their research mainly focuses on molecular data. However, it show that these methods can handle large and complex healthcare datasets. Faris et al. [3] develope a multiple modal diagnosis system. Their system uses patient answers and structured symptom data together. It was found useful in telemedicine services.

Naidu et al. [4] introduced a federated framework that al- lows disease diagnosis across different hospitals while keeping patient data private. Their work focuses on solving security and privacy issues in healthcare systems. It highlights the importance of protecting patient information. Kaur et al. [5] developed a disease prediction and drug recommendation system using data mining techniques. Their study shows that automated systems can help doctors choose suitable treatments.

Reports from the World Health Organization [6] show that neurological and chronic diseases are increasing worldwide. This creates a need for better and faster diagnosis systems. Data protection and patient privacy are also important concerns. The HIPAA guidelin are [7] explain how medical data should be protect and handled securely?

Review studies by Chen [8] and Bhatt et al. [9] provide an overview of recent developments in healthcare diagnosis systems. These studies explain how deep learning improve a medical image analysis and decision support systems. They also discuss challenges such as unbalanced data, lack of model transparency, and the need for proper clinical validation before real-world use.

A. Background

The use of intelligent computer systems in healthcare has increased in recent years because medical data is growing very fast. Hospitals now collect a large amount of patient information such as symptoms, medical history, and test reports. In traditional healthcare systems, doctors check this data manually. This process can take time and may sometimes cause delays or differences in diagnosis. Research shows that machine learning methods can reduce these problems by analyzing large datasets and identifying important patterns that are difficult to detect using normal methods [8].

The performance of these diagnostic systems is generally measured using accuracy, which is calculat as:

$$D^* = \arg\max P(D_k | X) \quad (2)$$

From (1), accuracy shows how many predictions are correct out of the total number of tested cases.
Computer-based diagnostic systems are now used in differ- ent medical areas such as disease prediction, medical image analysis, and treatment recommendation. These systems study patient symptoms, laboratory results, and past medical records to support doctors in making clinical decisions. Early detection using such systems helps improve treatment results and can reduce healthcare costs over time [1], [3].

The growth of telemedicine have increas the need for remote diagnostic solution. Healthcare platforms allow patients to receive initial medical assessment without visiting hospitals. This improves healthcare access, especially for people

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living in remote or rural areas [3]. However, there are still some challenges like patient data privacy, prediction accuracy, and trust in computer-generated results. These issues must be handled carefully for the system to be successfully used in healthcare [7].

III. PROPOSED SYSTEM

The MediSphere system uses a layered design to provide a reliable healthcare platform. Many Users access the system through a web, mobile app to enter symptoms, upload skin images, chat with the assistant and search for nearby hospitals. All request are securely send to backend through an API gateway.

In backend, machine learning models analyis the symptoms, medical history and skin images for predict diseases and provide a confidence score. The skin detection module iden- tifies common problems like acne, eczema, psoriasis, fungal infection and skin cancer.

The system also give treatment suggestions and store many patient data securely in a central database. A hospital finder helps users quickly locate nearby medical facilities.

A. Issues and Challenges

While the system works, there are a few things that can get in the way:

- Protecting patient data privacy and security is a major concern.
- AI models depend on high quality and unbiased medical data.
- Poor image quality can affect skin disease detection accuracy.
- Explaining AI diagnosis results to doctors is difficult.
- Integrating multiple system modules increases system complexity.
- Users may hesitate to trust AI-based medical predictions.
- System performance may reduce with a large number of users.
- Continuous model training and updates are required.

B. System Architecture

- **User Layer:** This is the part where patients and doctors use the system. They log in, enter symptoms, upload skin photos, talk with the chatbot and check the results using a web and mobile app.
- **Application Layer:** This layer handles all user re- quests. It check the symptoms, processes skin images and manage the connection between different parts of the system.
- **Processing Layer:** This part study the symptoms and medical details to predict diseases. It also checks uploaded skin images to find possible skin problems.
- **Database Layer:** This layer safely stores patient information, medical history, diagnosis results and treatment details for future use.
- **Location Layer:** This part helps users find nearby hospitals and clinics using location services.
- **Feedback Layer:** This layer shows the diagnosis result, confidence score and treatment advice in a clear and easy way.

IV. METHODOLOGY

- **Data Collection and Preparation:** Patient data such as symptoms, medical history, test reports, and skin images are collected. The data is then cleaned to remove errors and missing values. Skin images are adjusted to improve their quality before analysis.
- **Disease Prediction Training:** The system is trained using past medical records to learn disease patterns. It studies symptoms and connects them with known diseases.
- **Skin Disease Detection:** When a user uploads a skin image, the system checks the image and predicts possible skin problems. A confidence score is also shown with the result.
- **Treatment Suggestion:** Based on the predicted dis- ease, the system provides basic treatment advice and guidance.
- **System Testing:** The system is tested using different data to check its accuracy and overall performance.

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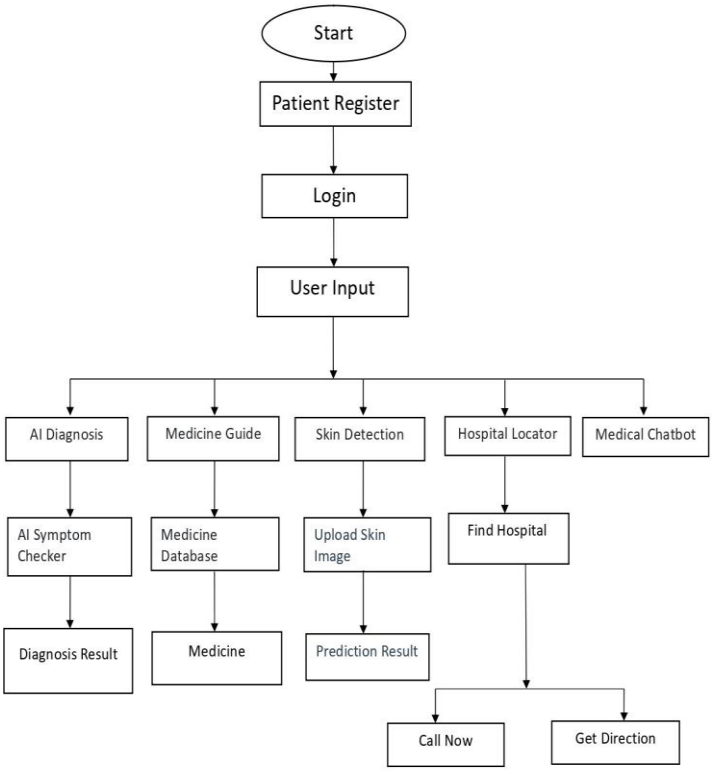

Fig. 1. Proposed System Architecture

V. RESULT

A. User Authentication Module

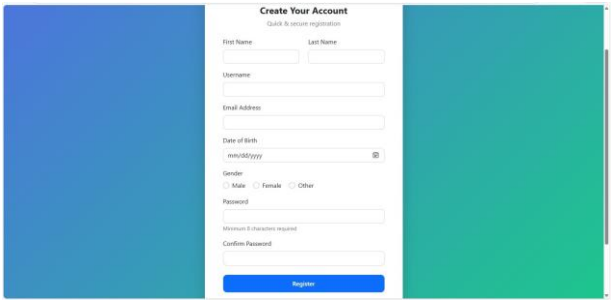

Fig. 2. User Login and Registration Interface

Fig. 3. User Login and Registration Interface

Figure 3 All users must be register and log in with their username and password. This helps to keep the system secure and prevents unauthorized access.

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B. System Dashboard

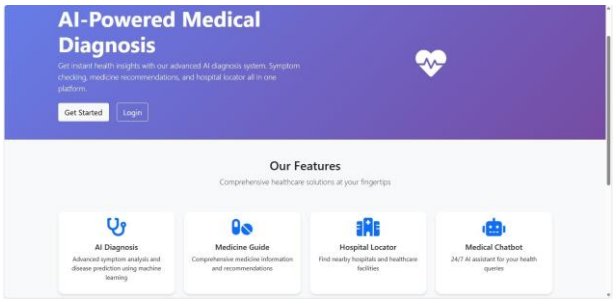

Fig. 4. MediSphere User Dashboard

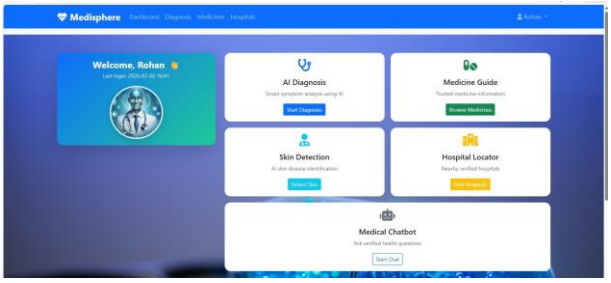

Fig. 5. MediSphere User Dashboard

Figure 5 It show the main dashboard of the system. From this page the users can access all services like disease prediction, skin disease check, hospital finder and chatbot. The dashboard makes it easy to move between different features.

C. Symptom-Based Disease Prediction

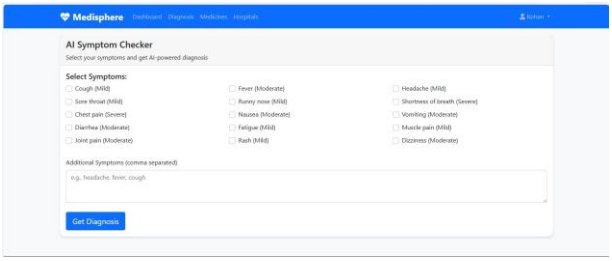

Fig. 6. Symptom Selection Interface

As shown in Figure 6 users can choose their symptoms and select how severe they are. The system studies this information and predicts possible diseases. This helps users get basic health information before visiting a doctor.

D. Skin Disease Detection

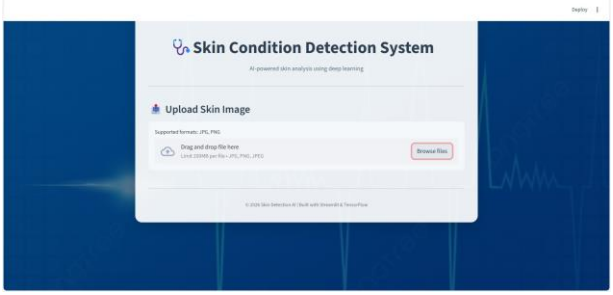

Fig. 7. Skin Image Upload Interface

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Figure 7 shows the page where users can upload a skin image. The system accepts image files and checks them for possible skin problems. The image is prepared for analyzed by the already train model.

E. Prediction Output

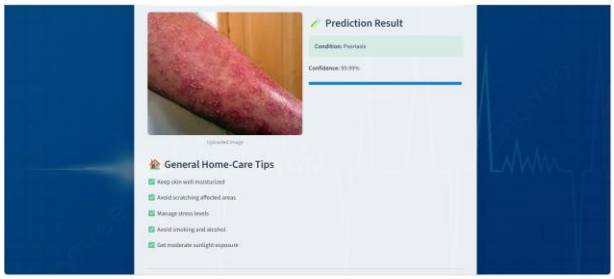

Fig. 8. Skin Disease Detection Result

Figure 8 It show the final result page. The system displays the detected skin condition along with a confidence score and simple care advice. This shows that the model can identify visible skin problems correctly.

F. Result

TABLE I
MEDISPHERE SYSTEM ACCURACY ANALYSIS

Parameter	Value
Total Test Cases Evaluated	120
Correct Predictions	114
Incorrect Predictions	6
Overall System Accuracy (%)	94.8%

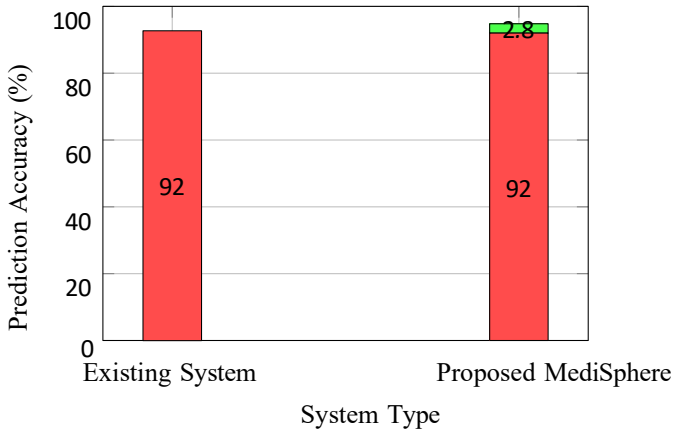

Fig. 9. Accuracy comparison between the existing system and the proposed MediSphere system

The graph compares the prediction accuracy of the ex- isting system and the proposed MediSphere system. The X-axis shows the system type, and the Y-axis shows the accuracy percentage from 0 to 100. The red color shows the main accuracy of both systems. The green part in the second bar shows the small increase in accuracy of the MediSphere system.

VI. CONCLUSION

MediSphere is a simple and useful health support system. It check symptoms and skin images to predict disease and give a precision score and treatment advice. The system achieved 94.8% accuracy during testing. It helps doctors make better decisions and supports early disease detection.

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VII. LIMITAIONS AND CHALLENGES

- Protecting patient data is very important.
- The system needs correct and good quality medical data.
- Poor image quality can affect skin disease results.
- Wrong symptom input can affect the prediction re- sult.
- Due to paid API limits, the system may not always show the exact hospital location.

VIII. FUTURE SCOPE

1) Connect with wearable devices
2) Support online doctor consultation
3) Add mental health support
4) Improve prediction accuracy
5) Add more diseases
6) Expand to rural areas
7) Help hospitals manage resources

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