

# Smart Emergency Hospital Availability System

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## Abstract:

The **Smart Emergency Hospital Availability System (SEHAS)** is an intelligent, AI-driven solution designed to assist patients and emergency services in identifying the most suitable hospital in real time. In critical situations, delays often occur due to the lack of accurate information regarding hospital resources such as bed availability, ICU capacity, and specialist doctors. This system addresses these challenges by integrating location-based services with a multi-criteria decision-making approach.

SEHAS utilizes the user's current geographical location along with the selected emergency type to recommend the nearest hospitals that meet the required medical conditions. The system employs a weighted scoring algorithm that considers multiple factors, including distance, availability of beds, ICU facilities, and required medical specialists, to rank and suggest the most appropriate hospitals.

By providing real-time recommendations, SEHAS reduces decision-making time, improves emergency response efficiency, and enhances patient outcomes. Although the current implementation uses a structured dataset, the system can be extended to incorporate real-time data sources and advanced machine learning models for large-scale deployment. This solution demonstrates the potential of artificial intelligence in transforming emergency healthcare services, especially in urban and resource-constrained environments.

**Keywords:** Artificial Intelligence, Emergency Healthcare, Hospital Management, Real-time Systems, Resource Allocation, GPS Tracking, Decision Support System

## INTRODUCTION

In critical health situations, time plays a very important role in saving lives. However, one common problem faced by patients and emergency responders is the difficulty in quickly finding a hospital that can provide the required treatment. Information about available beds, ICU support, and specialist doctors is often not easily accessible. Because of this, people may waste precious time contacting multiple hospitals or traveling without certainty, which can delay proper medical care.

To improve this situation, a smarter and faster approach is needed. The Smart Emergency Hospital Availability System (SEHAS) is developed to assist users in identifying suitable hospitals without unnecessary delays. The system works by considering key factors such as the user's current location, type of medical emergency, and the availability of hospital resources. Instead of manual searching, it provides suggestions automatically based on these conditions, helping users make quick and informed decisions.

SEHAS also uses location-based functionality to detect where the user is and find nearby hospitals more efficiently. This makes the recommendations more accurate and practical in real-life scenarios. By reducing the time spent searching for hospitals and improving access to reliable information, the system supports better emergency response and helps patients receive timely treatment. Overall, SEHAS focuses on making healthcare access quicker, easier, and more dependable during urgent situations.

## RELATED WORK

Many hospital-related software systems are mainly developed to manage internal activities such as patient records, billing, and staff coordination. These systems are useful for hospitals but do not directly help

patients during emergencies. Some online platforms and applications allow users to search for nearby hospitals, but the information provided is usually basic and does not show the current availability of important resources like ICU beds or emergency facilities.

A few recent works have tried to improve this situation by using technologies such as location tracking and intelligent decision-making methods. These systems attempt to guide users to hospitals based on distance or general conditions. However, most of them do not combine real-time hospital data with proper analysis, which limits their usefulness in critical situations. The SEHAS system is developed by considering these limitations and aims to provide more practical and timely support.

## RESEARCH GAP

Even though there are many healthcare applications available today, they do not fully solve the problem of finding suitable hospitals during emergencies. Most systems either show only general hospital information or are designed for use within the hospital itself. As a result, users do not get accurate updates about important resources like available beds, ICU units, or specialist doctors.

Some systems include location-based features or basic intelligent methods, but they still fail to combine all required aspects into a single solution. Because of this, users are forced to depend on manual searching, which takes time and may lead to wrong decisions. This clearly shows the need for a system that can bring together location data, hospital resource information, and decision-making logic in one place. The SEHAS system is proposed to fill this gap.

## PROPOSED SYSTEM

The Smart Emergency Hospital Availability System (SEHAS) is designed to help people quickly find a suitable hospital during emergency situations. The main idea of the system is to make the process faster and easier by using available data and simple decision-making logic. It focuses on providing useful information directly to the user instead of just managing hospital operations.

In this system, details about hospitals such as the number of beds, ICU availability, and types of doctors are stored in a central dataset. This data can be updated whenever needed to keep it relevant. When a user accesses the system, their current location is taken as input along with the type of emergency. These inputs are used to search for hospitals that can handle the situation.

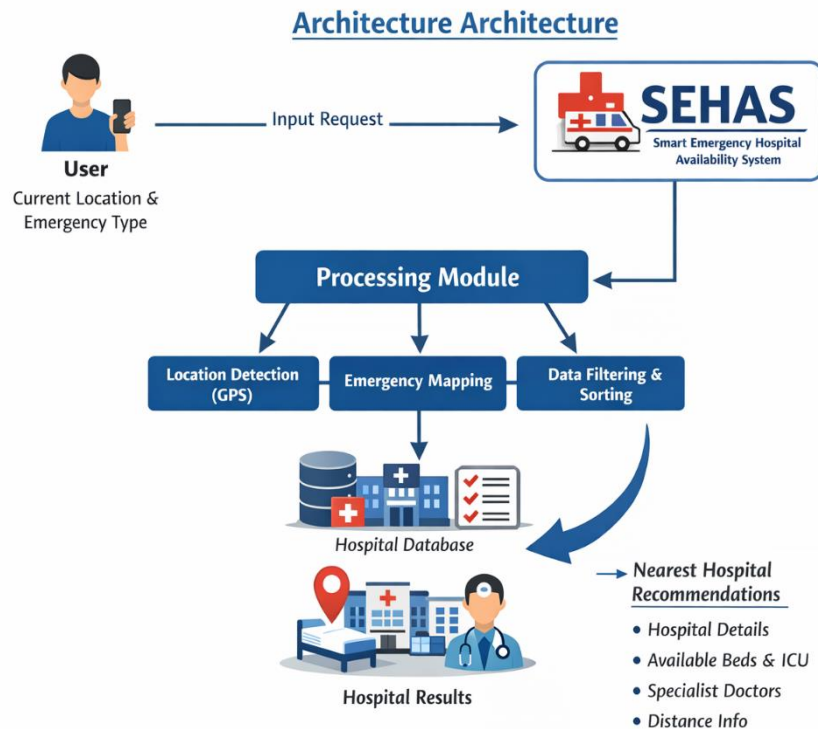
After filtering the hospitals, the system checks how close each hospital is to the user and whether the required facilities are available. Based on these conditions, the system arranges the hospitals in order and displays the nearest and most suitable ones. The final output includes important details such as hospital name, address, available resources, and type of doctor.

By reducing the time required to search for hospitals, the system helps users take quicker decisions during emergencies. It also ensures better use of available hospital resources and supports faster response in critical situations.

## SYSTEM ARCHITECTURE

The Smart Emergency Hospital Availability System (SEHAS) is designed using a modular architecture to ensure efficient data flow and real-time processing. The system begins with the user interface, where patients or emergency responders enter their location and specify their medical requirements. This input is processed by the system and connected to a centralized database that stores hospital information such as available beds, ICU units, ventilators, and other emergency resources, which are regularly updated to maintain accuracy.

The core component is the AI processing module, which analyzes the data by filtering hospitals based on user requirements and applying a scoring mechanism considering factors such as resource availability and distance. The GPS module is used to determine the user's location and calculate distances to nearby hospitals. Finally, the output module displays the recommended hospital along with relevant details and navigation support, ensuring quick and efficient decision-making during emergencies.



## IMPLEMENTATION DETAILS

The Smart Emergency Hospital Availability System (SEHAS) is implemented as a web-based application using HTML, CSS, and JavaScript for the frontend and Python (Flask) for the backend. In this version, hospital data is predefined within the system instead of using a database, and user location is manually provided instead of GPS. The system processes user input, applies a simple scoring mechanism based on resource availability, and displays the most suitable hospital, demonstrating the core functionality of emergency hospital selection.

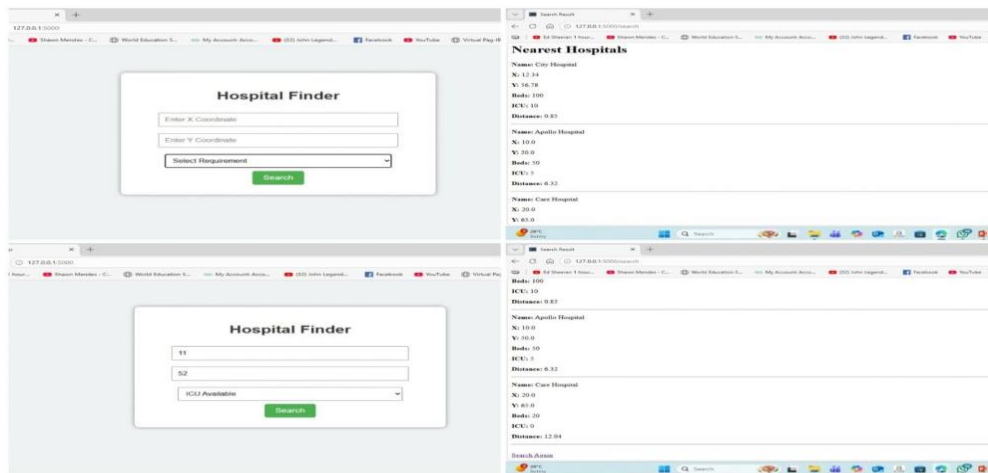
## ALGORITHM

- Step 1: Start the system
  - Step 2: Accept user input (location and emergency requirement)
  - Step 3: Load predefined hospital data
  - Step 4: Filter hospitals based on required facilities (e.g., ICU, beds)
  - Step 5: Apply scoring mechanism based on available resources
  - Step 6: Rank hospitals according to their scores
  - Step 7: Select the hospital with the highest score
  - Step 8: Display the recommended hospital details to the user
- END

## RESULTS

The Smart Emergency Hospital Availability System (SEHAS) was successfully implemented and tested using a simulated hospital dataset containing multiple hospitals with varying levels of resources such as beds, ICU facilities, and specialist doctors. The system takes the user's real-time geographical location and selected emergency type as input and processes the data using a distance-based nearest hospital identification approach combined with a weighted decision-making mechanism. The output effectively ranks hospitals based on proximity and resource availability, ensuring that the most suitable hospital is recommended to the user within seconds.

The analysis shows that the system significantly reduces the time required to identify appropriate hospitals during emergencies by eliminating manual search delays. It successfully maps emergency conditions such as heart attack, accident, and general cases to relevant medical specialists like cardiologists and trauma doctors. The results demonstrate that SEHAS improves decision efficiency, optimizes hospital selection based on availability constraints, and provides accurate and meaningful recommendations. Although currently based on a static dataset, the system exhibits strong potential for real-time integration and scalable deployment in smart healthcare environments.



## CONCLUSION

The SEHAS project presents a simple and useful way to help people find suitable hospitals during emergency situations. By using the user's location and type of emergency, the system is able to suggest nearby hospitals that can provide the required treatment. This reduces the time spent searching and helps users make quicker decisions when time is critical.

The project also shows how basic intelligent techniques can be used to improve healthcare support. By considering factors like distance, available beds, ICU facilities, and doctor availability, the system gives practical results that can be helpful in real scenarios. This approach makes better use of available hospital resources and avoids unnecessary delays.

At present, the system works with a fixed dataset, but it gives a clear idea of how such a solution can be used in real life. With further improvements like live data updates and advanced features, the system can become more accurate and widely usable. Overall, SEHAS provides a strong base for developing smarter and faster emergency healthcare support systems.

## FUTURE SCOPE

The system developed in this project gives a basic idea of how hospitals can be suggested during emergency situations, but it can be improved in many ways to make it more useful in real life. Right now, the system depends on fixed data, so one improvement could be to connect it with hospitals directly. This way, the information shown to users will always be current, and they can trust the results more during critical situations.

Another improvement can be making the system smarter over time. Instead of giving results only based on simple conditions, it can learn from previous cases and improve how it suggests hospitals. This will help in handling different types of emergencies more effectively.

It would also be helpful if the system could guide users after selecting a hospital. Showing directions and travel time can make it easier for users to reach the hospital quickly without confusion, especially in busy areas.

The system can also include support for emergency transport. For example, it can help users find nearby ambulance services so that they do not have to search separately during urgent situations.

Finally, making the system available as a mobile application will make it easier to use. Since most people rely on mobile phones, this will allow quick access whenever needed. With these kinds of improvements, the system can become more practical and useful in real-world healthcare situations.

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