International Journal of Interdisciplinary Innovative Research & Development (IJIIRD)
ISSN: 2456-236X
Vol. **11** Special Issue **02** | **2026**

Location- Based Emergency Severity Classification for On-site Helthcare Services

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DOI: 10.5281/zenodo.19286961

ABSTRACT

Location-based Emergency Severity Classification for On-site Services is an Android-based application designed to assist users in identifying and accessing appropriate healthcare services during emergency and non-emergency situations. The system works by collecting the user's location and categorizing healthcare requirements based on predefined severity levels such as low, medium, and high urgency. Based on this classification, the application guides users to relevant on-site medical services and healthcare facilities available nearby. The application uses a structured user interface with category-based navigation, allowing users to select medical needs such as specialist care or emergency assistance. Android Fragments and the Navigation Component are used to ensure smooth transitions and stable application flow. Location data is utilized to prioritize nearby healthcare services, improving response efficiency and reducing decision-making time during critical situations.

This system focuses on frontend-driven severity indication and location awareness, providing a scalable foundation for future integration of real-time data analytics, hospital crowd monitoring, and intelligent emergency response mechanisms. The proposed solution demonstrates how mobile applications can enhance accessibility, organization, and efficiency in on-site healthcare service management.

Keywords:- Location-based services, Emergency severity classification, On-site healthcare services, Android application, Healthcare accessibility.

1. INTRODUCTION

The increasing number of healthcare emergencies worldwide has created a strong demand for efficient on-site and supplementary healthcare services, especially in areas where specialized clinics or emergency medical units are not immediately available. In such scenarios, timely assessment and prioritization of emergencies become critical. This project focuses on location-based emergency severity classification to support on-site healthcare delivery.

The proposed system assigns urgency and severity levels to emergency requests by considering the user's geographical location and reported symptoms. By integrating location-aware situational awareness, the system enables better decision-making for on-site healthcare services, ensuring that semi-urgent cases are identified and addressed promptly. This approach improves emergency response efficiency and enhances healthcare accessibility in resource-limited or remote environments.

1.1 Background and Rationale

On-site healthcare services provided by public safety agencies and private healthcare organizations play a crucial role in responding to emergencies and reducing health risks when individuals face acute medical situations or hazardous conditions at specific locations. Effective emergency response depends on the rapid classification of severity and urgency, which must consider not only the nature of the emergency but also location-specific factors such as accessibility, surrounding infrastructure, and service availability. Existing emergency-triage systems attempt to classify emergencies using predefined inputs; however, many of these systems focus primarily on medical symptoms or text-based assessments and lack adequate consideration of location diversity. Such approaches limit their applicability in real-world on-site healthcare scenarios where emergencies may occur in varied environments

such as residential areas, workplaces, or transit locations. The absence of comprehensive location-aware severity parameters results in inefficient prioritization and delayed on-site response.

To address this gap, the proposed project emphasizes location-based emergency severity classification for on-site healthcare services. By integrating severity levels with location awareness, the system aims to improve situational understanding and support timely and appropriate healthcare assistance in diverse emergency

contexts.

2. METHODOLOGY

Emergency severity classification is traditionally effective in controlled healthcare environments where services operate within fixed locations and predictable conditions. However, in dynamic and unpredictable environments such as public venues, workplaces, or event-based scenarios, healthcare services must adapt to changing locations and varying incident patterns. In such cases, emergencies may occur across multiple locations over time, requiring continuous and location-specific severity assessment.

The proposed methodology addresses this challenge by incorporating location-aware factors into the severity classification process. When an emergency is reported, the system considers both the reported medical condition and the geographical context of the incident. Each location is evaluated based on predefined parameters such as accessibility, proximity to on-site healthcare services, and the availability of medical resources.

In situations involving multiple or overlapping incidents, the system performs on-demand severity assessment for each affected location. This approach enables context-sensitive prioritization of healthcare responses and supports effective resource allocation for on-site services. By combining medical severity indicators with location-specific factors, the methodology provides a structured and scalable framework for emergency severity classification in diverse environments.

2.1 Data and Input Sources

The proposed system utilizes multiple data inputs to support location-based emergency severity classification for on- site healthcare services. Primary inputs include user-provided information such as the type of medical issue, selected severity indicators, and the current geographical location of the incident. Location data is obtained through the mobile device's location services and is used to identify nearby on-site healthcare resources.

Additional contextual inputs include time of occurrence and category of the emergency, which assist in understanding situational urgency. These inputs are processed at the application level to ensure timely and structured assessment. The system relies on predefined datasets and configuration parameters rather than external real-time hospital databases, making it suitable for on-site and semi-urgent healthcare scenarios.

2.2 System Architecture

The classification framework is designed to assess emergency situations by combining medical severity indicators with location-aware contextual factors. Emergencies are grouped into predefined severity levels such as low, medium, and high urgency. Each emergency request is evaluated based on the reported condition and the location characteristics, including proximity to available on-site healthcare services.

The framework follows a rule-based approach, where user inputs are mapped to severity categories using predefined logic. Location awareness enhances the classification by prioritizing cases that require immediate attention based on accessibility and service availability. This structured framework ensures consistent and reliable severity assessment across diverse on-site environments.

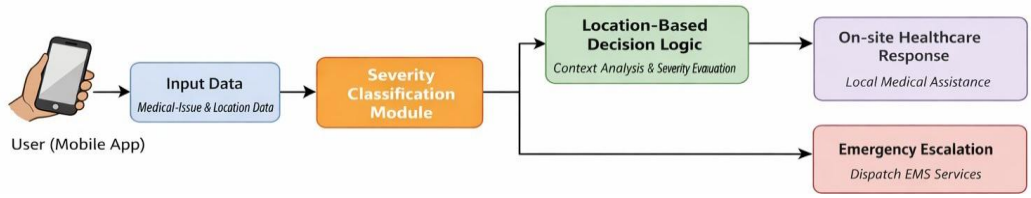
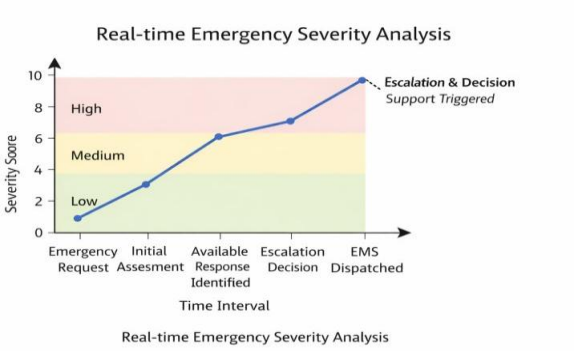


Fig -2: System Architecture

3. REAL TIME DATA ANALYTICS AND DECISION SUPPORTS

Real-time analysis enables the immediate evaluation of emergency conditions using medical and location-aware inputs. The system automatically classifies severity levels and provides decision support by recommending on-site intervention or escalation to external emergency services, thereby improving response efficiency and situational awareness.



Real-time Emergency Severity Analysis

4. LOCATION BASED FACTOR AFFECTING SEVERITY

The severity of on-site emergencies is heavily influenced by various location-specific factors, which provide critical context for assessing urgency and determining appropriate healthcare responses. **Population density** plays a significant role, as incidents occurring in highly populated areas generally require faster and more resource-intensive interventions due to the higher number of people at risk. **Accessibility** of the incident site, including road connectivity, traffic conditions, and proximity to responders, directly impacts response time and, consequently, the overall severity of the emergency.

Environmental hazards present at the location, such as fires, floods, chemical exposure, or structural instability, further contribute to the urgency and complexity of the situation. Additionally, the **type of infrastructure**—whether residential, commercial, industrial, or public—affects both the potential nature of injuries and the logistical challenges of providing on-site healthcare services. **Temporal factors**, such as the time of day, peak hours, or the occurrence of special events, also influence severity by affecting human activity levels and. resource availability

Finally, the **proximity to healthcare resources**, including nearby hospitals, clinics, and available first responders, plays a crucial role in determining the required response level. Locations situated far from essential medical facilities typically face increased risk and higher severity classifications. By systematically incorporating these location-based factors, the proposed system ensures more accurate emergency severity assessments, enabling timely, context-aware decision-making and optimized allocation of on-site healthcare resources.

5. RISK MANAGEMENT AND CONTINGENCY PLANNING

Effective on-site healthcare services require robust risk management and contingency planning to ensure timely response and minimize potential harm during emergencies. Risk management involves identifying potential threats to patient safety and operational efficiency, including delayed response due to location constraints, resource shortages, environmental hazards, or unforeseen incidents at the site. Each identified risk is evaluated based on its likelihood and potential impact on emergency outcomes.

Contingency planning focuses on establishing predefined strategies and protocols to address these risks. This includes allocating backup healthcare resources, defining escalation procedures for severe emergencies, and providing alternative response routes or locations in case primary options are unavailable. Real-time monitoring of emergency incidents and dynamic adjustment of response plans further enhance preparedness and resilience.

By integrating risk assessment with proactive contingency measures, the system ensures that on-site healthcare operations remain effective under varying conditions. This approach not only improves the reliability of emergency response but also contributes to better patient outcomes, optimized resource utilization, and overall safety during critical on-site healthcare interventions.

6. CONCLUSIONS

The proposed study on location-based emergency severity classification for on-site healthcare services highlights the critical role of integrating medical severity indicators with contextual location factors. By incorporating variables such as population density, accessibility, environmental hazards, infrastructure type, temporal aspects, and proximity to healthcare resources, the system provides a structured and context-aware framework for prioritizing emergencies and optimizing the allocation of on-site medical resources.

The methodology emphasizes real-time analysis and decision support, enabling timely interventions and appropriate escalation when required. Risk management and contingency planning further ensure operational resilience, allowing healthcare services to adapt effectively to dynamic and unpredictable emergency scenarios.

Overall, the implementation of a location-aware severity classification system enhances situational awareness, improves response efficiency, and contributes to safer and more effective on-site healthcare delivery. This

framework can serve as a foundation for future research and development of intelligent emergency management systems that integrate location analytics with real-time healthcare decision-making.

7. REFERENCES

[1] L. Mhadhbi, J. Akaichi, M. Hedi Karray, and B. Archimède, "Ontologies for location based services quality enhancement: the case of emergency services," 2015.
[2] A. Nimmolrat, K. Sutham, and O. Thinnukool, "Patient triage system for supporting the operation of dispatch centres and rescue teams," 2021.
[3] B. Jason Theiling, K. V. Kennedy, A. T. Limkakeng, P. Manandhar et al., "A Method for Grouping Emergency Department Visits by Severity and Complexity," 2020.