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Rescuenet: An Integrated Emergency Coordination And Alert System

P. Shilpasri[1], C.Mounika[2], Pravalika Akella[3], N.Shreya[4], M.Deekshitha Nandini[5], P. Krushi Yadav[6]

[1]Assistant Professor, Department of CSE (AI &ML), Vignan's Institute of Management and Technology for Women, Hyderabad, Telangana-501301, India

[2]Assistant Professor, Department of CSE, Kommuri Pratap Reddy Institute of Technology, Ghanpur(V), Ghatkesar (M), Medchal (D),500088

[3,4,5,6]UG Students, Department of CSE (AI & ML), Vignan's Institute of Management and Technology for Women, Hyderabad, Telangana-501301, India

[1]Email ID: shilpasri005@gmail.com, [2]Email ID: mounikachilukamari6395@gmail.com,

[3]Email ID: akellapravalika@gmail.com, [4]Email ID: shreyanagulapally@gmail.com,

[5]Email ID: nandudeekshitha@gmail.com, [6]Email ID: parshakrushiy@gmail.com

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ABSTRACT

The disaster response suffers from delayed responses when rescue agencies fail to coordinate appropriately. The main responsibility of RescueNet consists of establishing unified connections between emergency response organizations. Real-time location monitoring capabilities combined with communication features belong to RescueNet to enable several rescue organizations to work together effectively. Users accessing the website find posted details from agencies that show their locations and contacts along with their available resources. RescueNet map functions rely on GPS Technology to show registered agency positions though real-time visual display resulting in better emergency response coordination. This website enables agencies to work together efficiently through emergency response coordination by fixing communication problems that appear in crisis situations. RescueNet functions to protect human existence while minimizing the impacts of emergencies.

Keywords: *Disaster, GPS Technology, Agencies, RescueNet*

1. INTRODUCTION

The growing frequency of both naturally occurring and human-induced disasters creates a necessity for rescue agencies to establish effective coordination methods, which leads to efficient response activities. The current systems are not capable enough because they result in fragmented responses and delayed aid between rescue operations. A centralized database integrated with rescuenet application provides a solution through its unification of multiple rescue agency information to create one accessible platform. The Rescuenet platform depends on GPS technology to present registered agencies' status along with location in real time. Emergency decision-making becomes more effective through this feature because it quickly shows nearby agencies and resources available. The integrated communication features of the platform enable real-time sharing of alerts and vital information, improving coordination during disaster response. The platform provides an interface that enables people to respond during an emergency. The RescueNet solution aims to close existing gaps found in disaster management systems through new collaborative features that enhance agency interlocking operations. Through this innovation, relief operations gain speed and efficiency, and the total disaster impact decreases while the number of lives saved and community recovery increases effectively.

2. LITERATURE SURVEY

SNO	TITLE	AUTHOR	ACHIEVEMENTS	LIMITATIONS
1	RaaS: Rescue Management System for Disaster using Cloud Computing [1] [1]	Subasish Mohapatra, Muskan Khedia, Subhadarshini Mohanty	It provides a platform that contains accommodation details of the shelters. Conformation of rescued people with the help of registered fingerprints.	It provides communication only among agencies. It contains locations only of the shelters.
2	Rescue Relief Agency Management for Disaster Recovery [2]	Dr. Bhanumathi S, Palavali Harsha Sai, Rakesh N	It involves a multi-faced methodology. It provides communication among users and rescue agencies. It allows transfer requests between agencies.	It doesn't offer real-time maps.
3	Applications of drone in disaster management: A scoping review [3]	Sharifah Mastura Syed Mohd Daud, Mohd Yusmiaidil Putera Mohd Yusof, Chong Chin Heo	It helps with monitoring, mapping and data assessment. It is used for searching and rescuing. It helps with transportation of medical supplies	Drones are cost effective. In prohibited areas drones cannot be deployed. Lack of photogrammetry quality.
4	Mobile Rescue Robot for Human Body Detection in Rescue Operation of Disaster [4]	Trupti B. Bhondve, R. Satyanarayan, Moresh Mukhedkar	It is a wireless sensor network. It detects the humans left behind in the rescue operation.	Sensor accuracy can be affected and may also generate fake alarms. Battery life is a limitation. It is cost effective

3. METHODOLOGY

RescueNet's system implements multiple technologies that support both frontend operations and backend information processing.

1. Frontend

React.js enables developers to construct user interfaces that display rescue updates with critical information in real-time along with location data. The site performance receives a significant boost from Vite because it delivers instant content updates that enable fast operational speed. JavaScript functions as the interface enhancement protocol to control button operations and forms and real-time change procedures. CSS serves the interface by providing expertise through well-designed visuals that operate across different sizes of screens.

2. Backend

Node.js manages the system core to process user requests and their locations and handles rescue-related database operations. The Express.js development framework simplifies API creation, thus enabling the frontend to obtain rescue information through structured requests. The application uses MongoDB to store user locations, emergency requests, and real-time alerts, thus keeping important data accessible when needed. The REST API functions as a connecting platform between the front

end and back end, maintaining smooth data transmission for user positions and rescue notifications.

3.1. ALGORITHM

The RescueNet system determines neighbouring destinations by measuring distances through Euclidean distance calculation. The coordinate-based method functions to find distances between two locations. The system shows users their nearest available partnered agencies on the website whenever they set a specified search range. The method works by measuring overall distance through squared difference calculation followed by summation then root extraction. The system measures spot distances by analysing position modifications both horizontally and vertically. Through its search function this website identifies organizations needing assistance within a 500-kilometer range.

1.Obtain the user's latitude and longitude with the help of GPS.

2.Fetch the latitude and longitude of all registered agencies from database.

3. For each agency, calculate Euclidean Distance.

4.If the distance is less than or equal to 500 KM, add agency to the list of nearby agencies.

5. Maintain a list or array of all agencies that satisfy the distance condition.

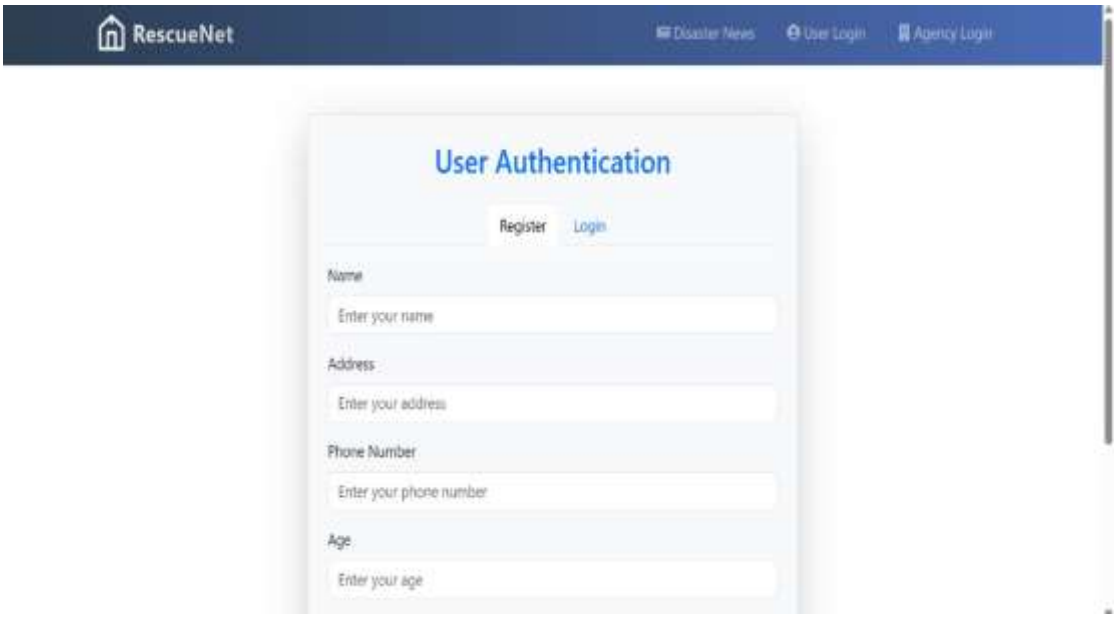
6. Display the nearby agencies with their location and contact info

7. Select the closest agency which is available.

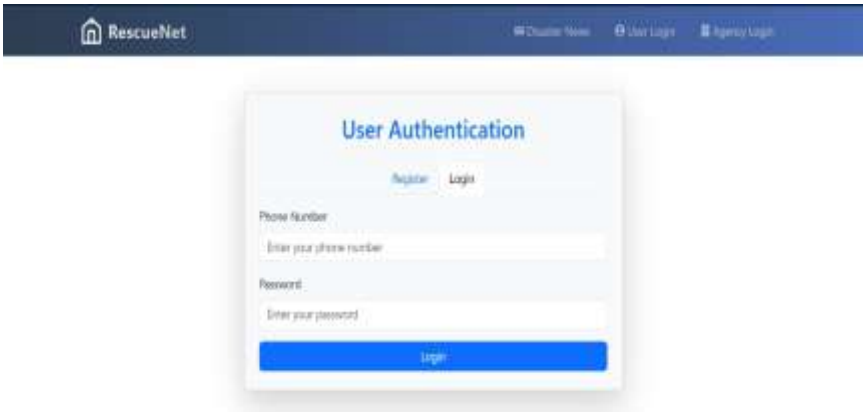
4. RESULTS

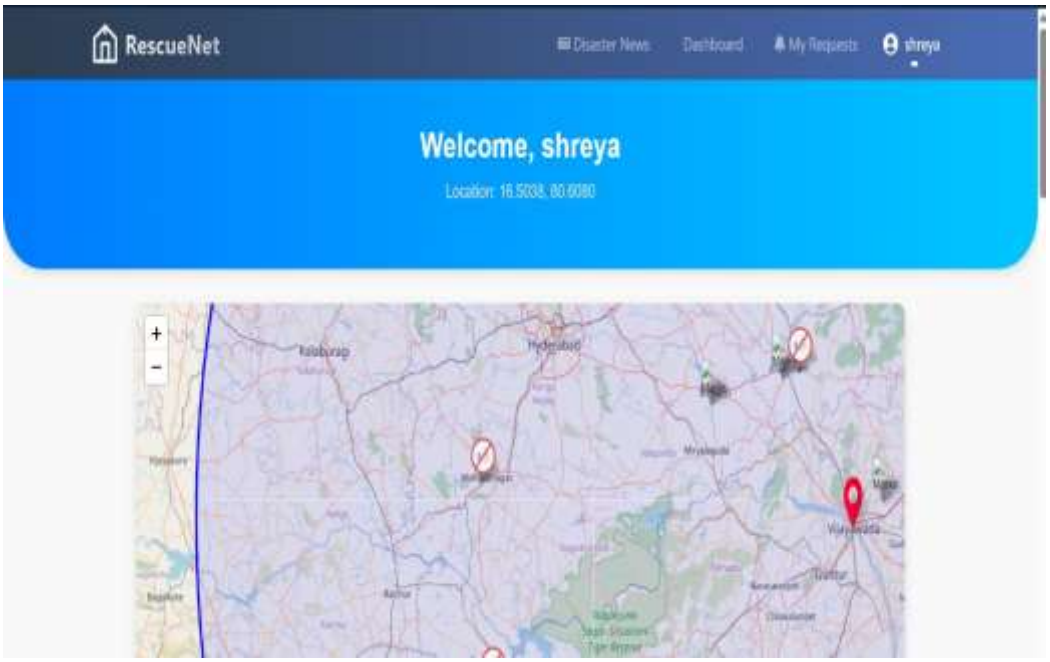
Our website shows the positions of all agencies who have registered with the platform. Applying GPS functionality enables the website to calculate distances through Euclidean distance calculations. At any time, the user operating through the agency platform can send a rescue request during emergencies. The system generates alerts and notifications with rescue requests made by agencies. The application saves data records for a duration of 90 days spanning working days. Through our platform users can view locations as well as send messages to our agency through the messaging capabilities. The process of updating and reporting the disaster conditions and affected area status relies on communication and coordination methods between teams. The rescue management utilizes available data to locate affected areas and extract survivors who remain trapped in emergency situations.

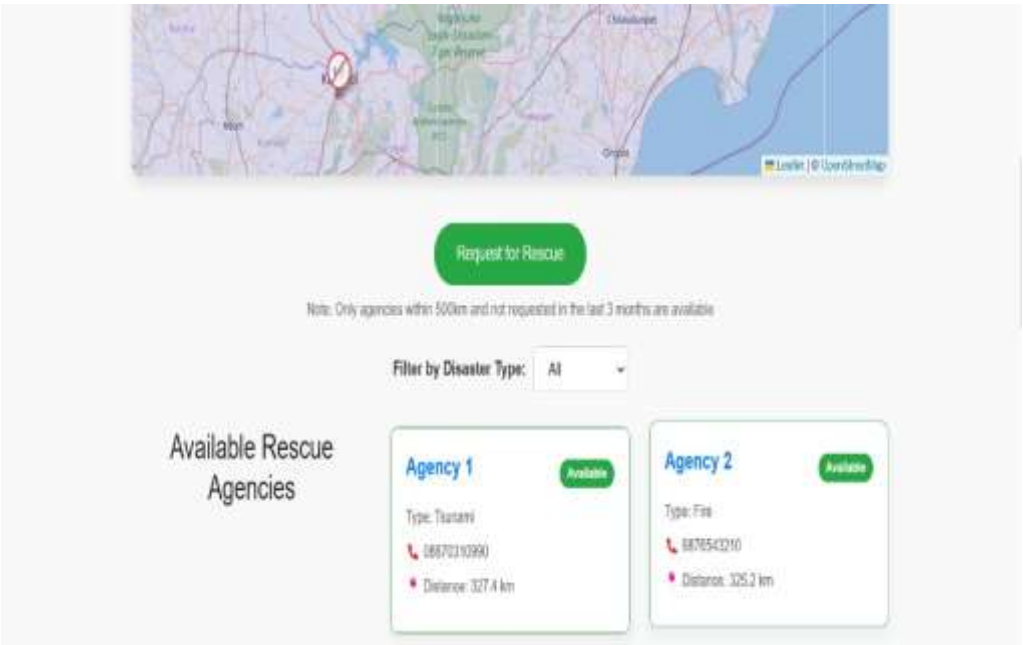
SCREENSHOTS




Name
Enter your name
Address
Enter your address
Phone Number
Enter your phone number
Age
Enter your age
Password
Enter your password
Location
Click to select location
Register


RescueNet
User Authentication
Register
Login
Phone Number
Enter your phone number
Password
Enter your password
Login


RescueNet
Disaster News
Dashboard
My Requests
shreya
Welcome, shreya
Location: 16.5038, 80.6080



5. CONCLUSION

The success of rapid emergency rescue depends on providing swift and efficient response abilities that determine whether people will live or perish. Real-time communication along with insufficient coordination tends to delay emergency response operations. The project addresses this issue through GPS tracking that enables real-time monitoring of rescue teams for quicker and more organized area access. The system functions to establish improved communication capabilities and enhanced coordination and delivers optimized resource utilization throughout emergencies. The implementation of contemporary technology enables rescue teams to create accelerated and better-informed choices, which leads to more efficient emergency response. The research delivers a functional and expandable method to enhance emergency rescue operations that adds value to disaster management practices. The innovative system cuts down emergency response duration while improving teamwork, therefore producing life-saving benefits and stronger disaster preparedness capabilities

6. FUTURE SCOPE

- Multi-Language Support: Multiple language support features should be implemented to achieve effective communication in worldwide agencies and different geographical regions.
- Offline Functionality: The application needs offline functionalities to keep running during moments without network availability so agencies can stay connected in limited connectivity environments.
- Data Security and Privacy: It needs to strengthen data protection by implementing advanced encryption schemes together with secure data storage methods to ensure sensitive information security against cyber threats.
- Post-Disaster Analysis Module: Create assessment instruments to measure response program success while detecting weaknesses along with extracting beneficial data for future enhancement.

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