A Survey on AI-Driven Platforms for Welfare and Emergency Services: Trends, Challenges, and Future Directions

Hemant Sudarshan B
Student(B. Tech, CST)
Dayananda Sagar University
Bangalore (India)
sudarshanhemanth@gmail.com

Lavanya Ramkumar
Student(B. Tech, CST)
Dayananda Sagar University
Bangalore (India)
lavanyaramkumar118@gmail.com

Afsha R
Student(B. Tech, CST)
Dayananda Sagar University
Bangalore (India)
afsha.rather2003@gmail.com

Prof. Vinayaka VM
Assistant Professor, CST
Dayananda Sagar University
Bangalore (India)
vinayaka-ct@dsu.edu.in

Abstract: In today's fast-paced world, addressing emergencies and welfare needs for individuals and animals often suffers from inefficiencies due to fragmented communication between aid organizations. The Centralized Aid and Response Platform (CARP) bridges this gap by providing a unified, AI-driven platform for real-time issue reporting and response coordination. Leveraging geolocation and AI-powered image recognition, CARP categorizes reported issues such as animal rescue, elderly care, or community aid and directs them to relevant facilities like NGOs and animal shelters. This research paper outlines the design, methodology, implementation, and potential impact of CARP, demonstrating its ability to streamline emergency responses and enhance community welfare.

Keywords: AI-driven platform, emergency response, geolocation, welfare services, image recognition, convolutional neural network (CNN), NGO collaboration, stray animal rescue

I. Introduction

The CARP system is a technological innovation aimed at revolutionizing social welfare responses. It offers a centralized solution where citizens can report emergencies by uploading images and descriptions. Utilizing AI for categorization and geolocation services, CARP ensures that issues are routed to the nearest and most appropriate welfare facilities, thereby enhancing efficiency and effectiveness in emergency responses. By bridging gaps in communication and leveraging AI technologies, CARP fosters transparency and accountability in welfare service delivery.

I. Introduction

Tomatoes, with their vibrant colors and juicy taste, transcend mere fruits, holding a cherished place in kitchens worldwide [1]. Their significance extends far beyond culinary delight; they occupy a central role in global agriculture, sustaining economies and nourishing millions [2]. The United Nations' Food and Agriculture Organization (FAO) approximates the worldwide alteration in tomato production value at a staggering 189.1 million metric tonnes in 2021, highlighting their immense economic contribution [3]. From fresh produce to processed goods like sauces and pastes, tomatoes play a multifaceted role in global food systems, underscoring their indispensability [4]. Consequently, any threat to tomato production reverberates through supply chains, affecting farmers, consumers, and economies alike [5].

1.1. Objectives

- Create a unified platform to report welfare issues.
- Use AI-driven image recognition for automatic categorization.
- Provide real-time notifications to relevant aid facilities based on geolocation.
- Foster collaboration among welfare organizations for efficient resource allocation.
- Enhance community engagement through transparency and feedback mechanisms.

1.2. Scope

CARP targets various domains including animal rescue, elderly care, and disaster relief. It is scalable and adaptable, making it a versatile tool for addressing evolving welfare challenges. Furthermore, the platform aspires to integrate additional domains such as food distribution and housing aid in future iterations.

II. Literature Review

2.1 Existing Research Works

Title	Author(s)	Proposed Work
Using Machine Learning and AI to Find Homes for the Voiceless	Neha Jha, Anushka Chaurasia, Pradyuman Chauhan, Vansh Rajput	K-Nearest Neighbor (KNN) algorithm to recommend pet breeds based on user preferences and lifestyle factors. The app features a question-based recommendation system and content-based filtering to personalize pet recommendations further 【1】.
Integration of Multiple Technologies in Web Environment for Emergency Management	V. Bhanumurthy, Vinod Kumar Sharma	Integration of technologies such as Remote Sensing (RS), Geographic Information Systems (GIS), Global Positioning Systems (GPS), and web technologies to manage emergency situations effectively. It proposes a framework that provides tools for disaster management, including real-time data collection, decision support, and communication systems 【2】.
Development of Web-Based System for Animal Shelter and Rescue in Johor State	Mabel Weeuthm, Hanayanti Hafit, Bernard Leong	Platform to support animal shelter and rescue organizations in Johor State, Malaysia, by enabling these organizations to register and manage their profiles effectively. It features a donation management system, a volunteer management system, and a reporting system for animal abuse 【3】.
Citizen-Based Sensing of Crisis Events: Sensor Web Enablement	Sven Schade, Laura Díaz, Frank Ostermann, Laura Spinsanti, Gianluca Luraschi, Simon Cox, Manoli Nuñez, Bertrand De Longueville	Integrates Volunteered Geographic Information (VGI) with Sensor Web Enablement (SWE) to detect and monitor crisis events. The system's core idea is to treat VGI as a valuable, real-time data source that can be structured and processed similarly for event detection 【4】.

Observed Trends

1. Increasing reliance on AI-driven models for efficient categorization and decision-making.
2. Emphasis on integrating geolocation technologies for targeted responses.
3. Collaboration between citizens and organizations to streamline welfare services.
4. Growing adoption of cloud-based systems for scalability and reliability.

Open Challenges

- Lack of systems that simultaneously integrate AI, geolocation, and real-time notification mechanisms.
- Limited focus on multi-domain welfare responses (e.g., combining animal rescue with human welfare services).
- Need for enhanced data collection methods to improve AI training and categorization accuracy.

2.2 Existing Platforms

Existing Platform	Description	CARP (Proposed Platform)
Be My Eyes	App connecting visually impaired individuals with sighted volunteers through live video calls for real-time assistance using geolocation 【5】.	CARP will facilitate real-time aid by matching users with relevant NGOs and services, utilizing geolocation and collaborative efforts.
Petfinder	Platform helping individuals find pets for adoption by connecting them with animal shelters and rescue centers 【6】.	CARP will integrate AI-driven image recognition to enhance animal rescue, including categorizing reports of lost or injured animals.
Uber for Volunteers (Concepts & Pilot Programs)	Systems connecting volunteers with people in need using geolocation and matching algorithms, akin to Uber for aid workers.	CARP will optimize volunteer coordination by adding AI-based predictive analytics to improve resource allocation and response times.

Identified Gaps

1. Existing platforms address specific domains but lack multi-domain adaptability.
2. Minimal use of AI for advanced categorization and predictive analytics.
3. Limited transparency and feedback mechanisms for improving user experiences.

III. Key Insights from the Survey

- **Technological Advancements:** AI and geolocation technologies show significant potential in automating welfare services.
- **Need for Integration:** Combining multiple welfare domains under a unified platform remains an underexplored area.
- **Role of Feedback:** Transparent feedback mechanisms improve accountability and service quality.

IV. Problem Definition

4.1 Problem Statement

The absence of a centralized, AI-driven system for reporting, categorizing, and addressing welfare issues leads to inefficiencies, delayed responses, and poor resource utilization. Current systems operate in silos, leading to fragmentation and under-utilization of available resources.

4.2 Relevance

Efficient welfare systems are critical in addressing time-sensitive emergencies like animal rescues or elderly care. Current systems fail to leverage available technology for effective collaboration and response. Addressing these inefficiencies is imperative to improving social welfare and community resilience.

V. Conclusion and Future Directions

5.1 Summary of Contributions

1. This survey highlights the current landscape of welfare technologies, identifying both advancements and gaps. CARP addresses the unmet needs by integrating AI, geolocation, and real-time communication into a single platform for multi-domain welfare services.

5.2 Future Work

1. Enhanced integration of predictive analytics to optimize resource allocation.
2. Expansion to additional welfare domains, including disaster management and mental health support.
3. Development of offline capabilities for low-connectivity regions.

V. References

1. Jha, N., et al. "Using Machine Learning and AI to Find Homes for the Voiceless." 2024 2nd International Conference on Disruptive Technologies.
2. Bhanumurthy, V., Sharma, V. "Integration of Multiple Technologies for Emergency Management." Remote Sensing for Disaster Management.
3. Wee, M., et al. "Development of Web-Based Systems for Animal Shelter and Rescue." Applied Information Technology.
4. Schade, S., et al. "Citizen-Based Sensing of Crisis Events." Applied Geomatics.
5. Technological Advancements: AI and geolocation technologies show significant potential in automating welfare services.
6. Need for Integration: Combining multiple welfare domains under a unified platform remains an underexplored area.
7. Role of Feedback: Transparent feedback mechanisms improve accountability and service quality.
8. Technological Advancements: AI and geolocation technologies show significant potential in automating welfare services.
9. Need for Integration: Combining multiple welfare domains under a unified platform remains an underexplored area.
10. Role of Feedback: Transparent feedback mechanisms improve accountability and service quality.