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A Survey on Artificial Intelligence in Food Redistribution

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Abstract: Hunger continues to be a global challenge, affecting millions of individuals despite advancements in food product and technology. This paper presents an AI-enabled food donation platform designed to grease real-time reporting of surplus food by donors. The system uses artificial intelligence to assay vacuity and match donations with the nearest NGOs and food banks grounded on position, demand, and urgency. Real-time notifications, efficient coordination, and analytics tools are integrated to ensure seamless operations and transparency. Food banks have the flexibility to accept or decline donations, allowing for optimized redistribution without assessing burdens related to storage or transportation.

I. INTRODUCTION

Over 800 million people worldwide suffer from hunger and malnutrition, largely due to profitable inequality and hamstrung food distribution systems. Although some regions experience food overpluses, logistical walls and shy collaboration hamper redivision to those in need. Traditional donation systems frequently warrant real-time responsiveness, leading to avoidable food waste and detainments.

- Artificial intelligence (AI) has the implicit to significantly enhance food donation processes by perfecting distribution effectiveness and availability. By vaticinating demand, assessing donation felicity, and automating communication between benefactors and donors, AI can streamline food redivision sweats.
- This paper introduces a mobile operation that enables benefactors to incontinently reportfat food. AI algorithms process this data and match it with near NGOs andfood banks, taking into account urgency, distance, and capacity. The systemincorporates Google Charts for precise geolocation and sends real-time cautions for rapid-fire collection. Analytical tools track the movement and impact of donations.
- Our thing is to make a sustainable, AI-powered ecosystem for food donation —reducing waste, enhancing responsiveness, and icing that fat food reachesthose in need fleetly and effectively.

II. LITERATURE SURVEY

Several studies have explored how AI can combat food instability. Below is a consolidated overview:
AI in Food Donation Platforms

- Smart systems connect benefactors to NGOs in real time.
- Geolocation and AI enable immediate shadowing and cautions for perishable food.
- Automated matching improves donation effectiveness.

AI in Demand soothsaying

- Machine literacy models prognosticate indigenous food requirements.
- Consumption patterns are analysed to target high-precedence areas.
- Algorithms prioritize distribution grounded on shelf life and urgency.

AI in Food Waste Management

- Analytics identify trends in food fat to help waste.
- Donation schedules are optimized using AI-driven perceptivity.
- NGOs profit from data-supported decision-timber.

Geolocation-Grounded Distribution

- AI integrates with mapping services to detect benefactors and donors.
- Route optimization ensures quick pickups and reduced corruption.
- Heatmaps reveal underserved zones and donation frequence.

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Ethical and Social Impacts

- AI ensures fairness by allocating food grounded on need.
- System translucency builds patron trust.
- Policymakers can use data perceptivity for hunger mitigation strategies.

3. Objectives

- To develop a real-time, AI-grounded platform for food donation.
- To assay vacuity and urgency using AI for smarter distribution.
- To enhance collaboration through geolocation and announcement systems.
- To use data analytics for impact assessment and translucency.
- To support informed decision-making for NGOs regarding food acceptance.

III. METHODOLOGY

The system armature integrates AI and geolocation features, following these core factors:

Real-Time Food Reporting

- Benefactors input fat food details via a mobile app.
- AI excerpts applicable information: type, volume, expiration, and position.

AI-Grounded Matching Algorithm

- AI evaluates NGO demand, propinquity, and preferences.
- The system prioritizes matches grounded on urgency and felicity.

Google Charts Integration

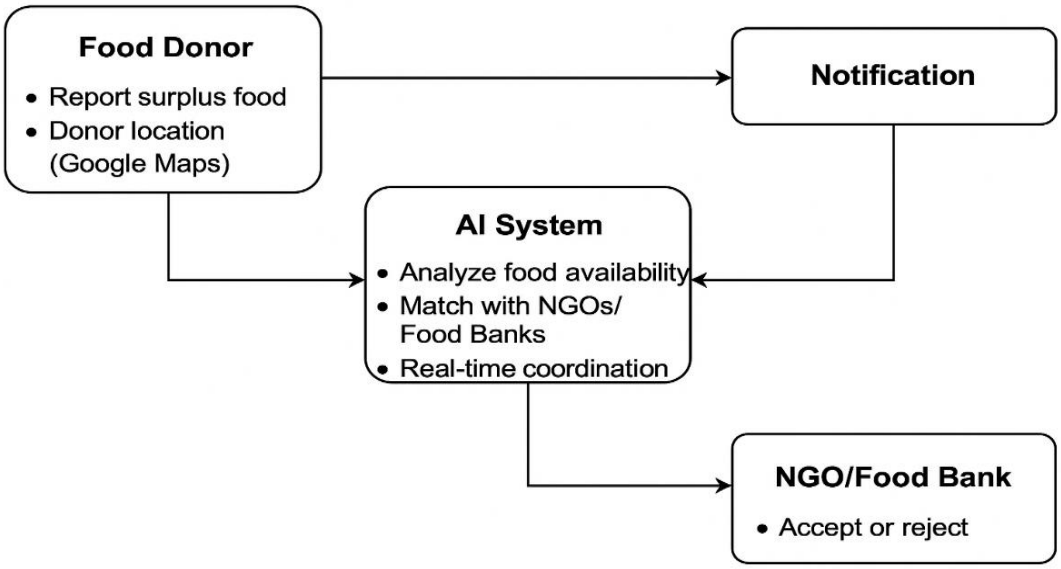
- Real-time position data enhances route planning and mapping.
- The fastest route to the patron is calculated for effective volley.

Announcement and Evidence System

- Eligible NGOs admit immediate cautions.
- They may accept or reject donations; AI reroutes rejections to other NGOs.

Data Analytics and Reporting

- Donation patterns and system performance are continuously tracked.
- Reports companion advancements in distribution strategies.



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IV. APPLICATION REQUIREMENTS

To implement the system effectively, the following technologies are required:

- **AI Algorithms:** For matching, forecasting, and impact analysis.
- **Cloud Infrastructure:** Enables real-time data storage and access.
- **Mobile/Web Interface:** Accessible platforms for users and NGOs.
- **Google Maps API:** For accurate geolocation services.
- **Notification System:** Ensures rapid response from stakeholders.

V. CASE STUDIES

- **MealConnect (Feeding America):** AI-driven connections between donors and hunger relief groups.
- **ShareTheMeal (WFP):** Mobile donations powered by AI to support global feeding efforts.
- **Food Rescue US:** Automates food redistribution via AI-based coordination.
- **No Food Waste (India):** Uses AI and location services to link food donors with recipients.

VI. CHALLENGES AND ETHICAL CONSIDERATIONS

- **AI Accuracy:** Mismatches may result in food waste.
- **NGO Constraints:** Some NGOs may reject specific food types.
- **Privacy:** Secure handling of donor/NGO location data is critical.
- **Scalability:** The platform must adapt to increased usage and broader geographies.

VII. FUTURE PROSPECTS

- **Blockchain Integration**: To improve transparency and traceability.
- **AI Chatbots**: For instant communication between users and NGOs.
- **Enhanced Analytics**: To refine forecasting and impact evaluation.
- **Global Expansion**: Connecting with international hunger relief efforts.

VIII. CONCLUSION

Artificial intelligence-driven donation platforms provide an effective approach to tackling food wastage and addressing hunger. By using AI to enable real-time food tracking, efficient geolocation, and data-driven decision-making, such platforms bridge the gap between food surplus and need. Continued development in AI and system scalability will further improve global food redistribution networks.

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