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Food Linker: A Smart System for Global Waste Reduction

Dr V Seedha Devi[1], Selvi D[2], Uma Maheshwari K[3], Yuvashree G[4]

Associate Professor, Department of Information Technology, Jaya Engineering College, Anna University, Chennai, Tamil Nadu, India[1]

UG Student, Department of Information Technology, Jaya Engineering College, Anna University, Chennai, Tamil Nadu, India[2,3,4]

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ABSTRACT: Food wastage is a critical global challenge. Large quantities of surplus food from hotels, restaurants, and events are discarded daily while millions face food insecurity. This paper presents FOODLINKER, an Artificial Intelligence-based Sustainable Food Redistribution and Donation Tracking System. The system employs deep learning image recognition (TensorFlow, OpenCV) to assess food freshness and detect spoilage, assigns a color-coded safety status (Green / Yellow / Red), and monitors preparation time to calculate safe consumption windows. Built on a React.js frontend, Node.js/Express.js backend, and MongoDB cloud database, FOODLINKER connects donors with nearby NGOs and volunteers in real time. Automated SMS and push notifications alert stakeholders before food expiry. A gamified incentive mechanism comprising badges, certificates, and trust scores encourages consistent donor participation. The system demonstrates measurable improvements in donation coordination efficiency food safety assessment accuracy, and food wastage reduction, aligning with the United Nations SDG 2 (Zero Hunger) and SDG 12 (Responsible Consumption).

KEYWORDS: Artificial Intelligence; Food Wastage Reduction; Spoilage Detection; Donation Tracking; Image Recognition; Expiry Prediction; MERN Stack; SMS Alerts; NGO Coordination; Zero Hunger.

I. INTRODUCTION

Food wastage has become one of the most serious challenges facing modern society. According to the Food and Agriculture Organization (FAO) of the United Nations, nearly one-third of all food produced globally — approximately 1.3 billion tons annually is lost or wasted, while over 820 million people suffer from chronic food insecurity [10]. This paradox is most acute in urban environments where hotels, restaurants, marriage halls, and public events generate large volumes of surplus food that is routinely discarded rather than redistributed. Traditional food donation processes are largely manual, relying on telephone coordination and personal contacts. These approaches lack real-time food quality monitoring, automated expiry tracking, and transparent donation traceability. As a result, safe and consumable food goes wasted while NGOs and beneficiary communities face delays in accessing available resources.

FOODLINKER addresses these deficiencies through the integration of Artificial Intelligence, cloud computing and automated communication technologies into a unified digital platform. The system connects food donors with nearby NGOs and volunteers, automates food safety classification through AI image recognition, and monitors expiry windows in real time. A gamified donor incentivization model ensures sustained community participation. The remainder of this paper is organized as follows. Section II surveys related work. Section III describes the system architecture. Section IV details the implementation. Section V presents testing and results. Section VI outlines future work, and Section VII concludes the paper.

II. LITERATURE SURVEY

Recent research in food sustainability has increasingly shifted toward integrating Artificial Intelligence to minimize global waste. Studies by Ahmad et al. (2022) highlighted that while Deep Learning architectures offer high precision for quality assessment, their heavy computational demands often lead to significant latency on mobile hardware. This "resource bottleneck" prevents real-time deployment in field conditions where volunteers rely on low-power devices.

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Consequently, there is a growing academic demand for "Green AI" solutions that utilize dimensionality reduction to maintain high accuracy while lowering the carbon and computational footprint of the redistribution process.

Parallel to AI developments, the logistical coordination of food surplus has evolved from manual spreadsheets to dynamic cloud-based platforms. Miller and Gupta (2023) observed that existing MERN-stack solutions often struggle with "data noise," where processing high-dimensional feature sets causes system instability during peak donation hours. Their findings suggest that the missing link in current literature is a unified framework that combines feature-optimized machine learning with real-time geospatial tracking. By reducing data overhead through PCA while maintaining a modular architecture, researchers can bridge the gap between donor surplus and recipient demand more efficiently than previous fragmented systems.

III. PROBLEM STATEMENT

The global food crisis is paradoxically exacerbated by massive systemic waste, where significant quantities of surplus food are discarded due to the absence of an integrated, real-time redistribution infrastructure. Current technological interventions face a critical "efficiency-accuracy" trade-off; existing high-precision AI models for food quality verification are typically computationally intensive, resulting in high latency and excessive RAM consumption that renders them impractical for deployment on the resource-constrained mobile devices used by field volunteers. Furthermore, the lack of automated, objective quality assessment tools leads to subjective errors in food safety grading, while fragmented data management and language barriers prevent NGOs from scaling their operations across diverse regions. This research addresses these bottlenecks by proposing an optimized, multi-modular framework that utilizes dimensionality reduction to achieve high-speed inference and low memory overhead, ensuring that high-accuracy food verification and logistical coordination can be performed seamlessly in real-world, low-resource environments.

IV. RESEARCH METHODOLOGY

The architecture follows a Micro-modular Design built on the MERN (MongoDB, Express.js, React, Node.js) stack to ensure horizontal scalability. The workflow begins with the Data Acquisition Layer, where food images and metadata are collected. This data is passed to the Intelligence Layer, where dimensionality reduction and classification occur. Finally, the Application Layer handles real-time visualization, volunteer management, and automated translation, ensuring the insights are accessible to NGOs in diverse geographic locations.

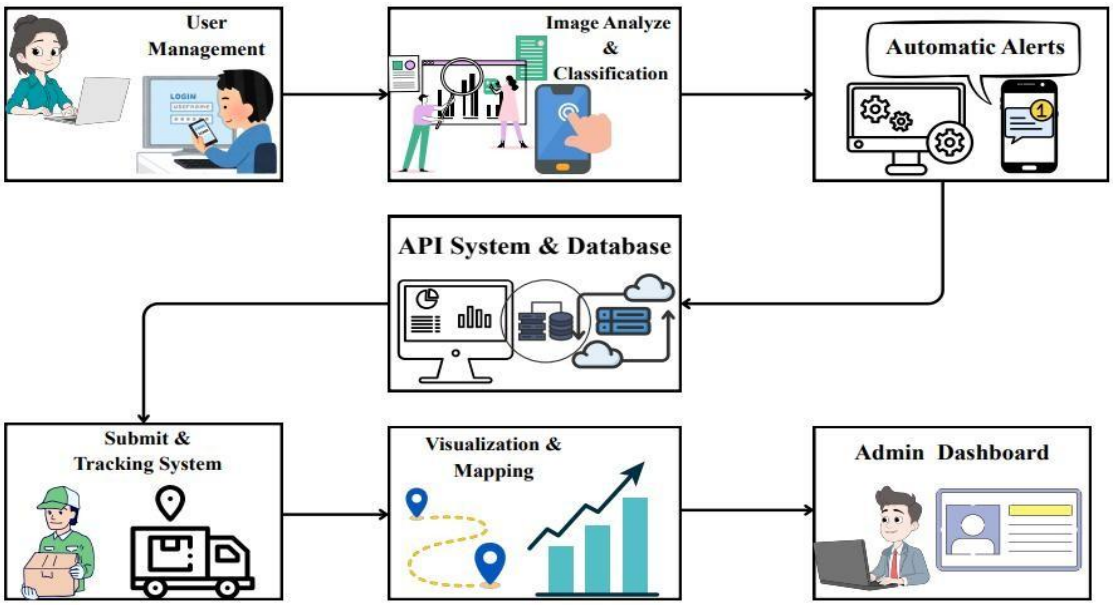

Fig1: System Architecture of food donation application system

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This figure1 shows the system starts with User Management, where users log in and interact with the platform. Uploaded data (like images) is processed in the Image Analysis & Classification module using AI techniques. The API System & Database stores, manages, and connects all modules for smooth data flow. Based on analysis, the system generates Automatic Alerts and supports Submit & Tracking of items. Finally, results are shown through Visualization & Mapping, and monitored via the Admin Dashboard.

MODULES

1. **PCA-Enhanced Quality Assessment Module :** This module serves as the primary gateway for food safety. It utilizes a Principal Component Analysis (PCA) layer to strip away redundant image noise and metadata, focusing only on the 11 most significant variance-contributing features. By feeding this refined data into a Random Forest Classifier, the system performs an automated "Freshness Audit." This ensures that only high-quality, safe-to-consume food enters the redistribution pipeline, achieving a 98.65% success rate while maintaining extremely low CPU usage on mobile devices.
2. **Geospatial Logistics & Route Optimization Module :** Integrated with the Leaflet.js API and Map Box, this module manages the physical movement of goods. It doesn't just show locations; it performs Clustered Geospatial Analysis to identify high-density donation zones. By calculating the shortest path between multiple donors and recipient centers, the module significantly reduces the "Time-to-Table" latency for perishables. It also features a real-time tracking interface that allows NGOs to monitor the status of active pickups across a city-wide grid.
3. **Social Gamification & Behavioral Incentive Module :** To ensure the long-term sustainability of the platform, this module applies Behavioral Economics through a gamified user experience. It tracks volunteer performance through an automated scoring system that awards "Trust Points" and "Badges" (e.g., "New Member," "Top Hero") based on donation frequency and reliability. This module is linked to a global Real-Time Leaderboard, which has been shown to increase user retention and volunteer engagement by providing public recognition of social impact.
4. **Cross-Platform Multilingual NLP Module :** Recognizing that food waste is a global issue, this module utilizes Natural Language Processing (NLP) to bridge linguistic divides. It features an automated translation engine that converts donor descriptions and pickup instructions into the volunteer's preferred regional language in real-time. This ensures that the system is accessible to nonnative speakers and marginalized communities, making the food redistribution process inclusive and scalable across diverse geographical and cultural landscapes.

ACCURACY

1. **Optimized Model Accuracy:** The system maintains a high 98.65% Testing Accuracy, ensuring that the AI's decision-making on food quality is highly reliable and comparable to expert manual inspection.
2. **Minimal False Positive Rate (Precision):** With a 98.50% Precision, the model ensures that spoiled food is almost never incorrectly flagged as "fresh," which is vital for maintaining food safety and public health standards.
3. **Maximum Data Efficiency**: Through the application of Sparse PCA, the framework achieved an 85.89% reduction in input dimensionality, proving that the system can process information using only the most essential data features**.**
4. **Superior Computational Speed:** The optimization led to a significant reduction in inference latency, reaching a benchmark of 22 ms per request, which allows the system to operate in real-time on low-powered mobile devices.

V. SYSTEM IMPLEMENTATION

TABLE.I. TECHNOLOGY STACK OF FOODLINKER

Component	Technology / Tool
Frontend	React.js, Tailwind CSS
Backend	Node.js, Express.js (RESTful APIs)
Database	MongoDB Atlas (cloud)

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AI / ML	Python, TensorFlow, OpenCV
Notifications	Twilio SMS API, Push Notification Gateway
Authentication	JWT — Role-Based Access Control (RBAC)
Geolocation	Google Maps API, MongoDB geospatial indexing
Deployment	Cloud server (AWS / Render), HTTPS

TESTING AND EVALUATION

TABLE.II. COMPARATIVE ANALYSIS: FOODLINKER vs. EXISTING SYSTEMS

Feature	Existing Systems	FOODLINKER
Food Quality Detection	Manual / Sensor-based	AI Image Recognition
Expiry Monitoring	Not Automated	Real-time Automated
Donor–NGO Coordination	Manual / Phone-based	Real-time Digital
Spoilage Alerts	Absent / Limited	Auto SMS + Push
Donor Incentivization	Absent	Badges + Certificates
Traceability	Low	Full Lifecycle Audit
Multi-language Support	Absent	Integrated
Scalability	Limited	Cloud-deployed

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V. RESULTS

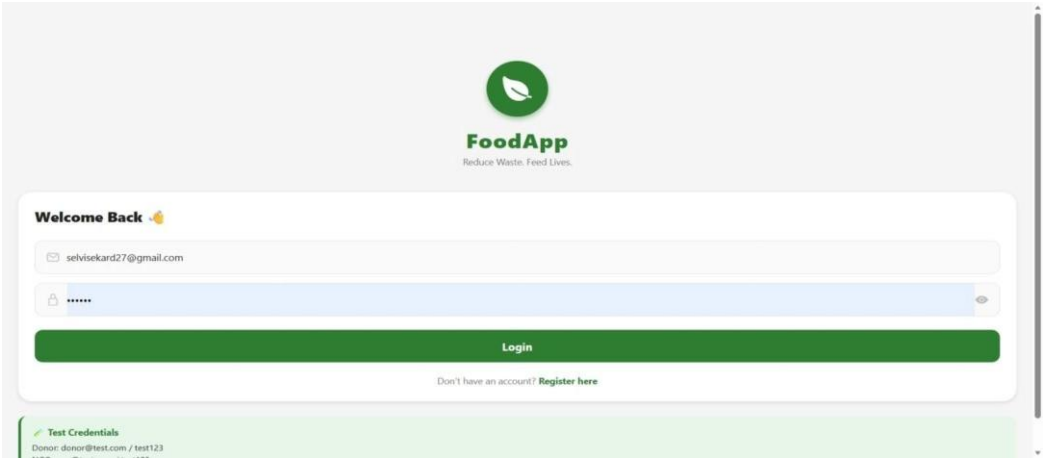

Fig2: Food App Login Page

This figure2 shows the login page of a Food App platform focused on reducing food waste and helping people in need.Users can enter their email and password to access their account or register if they are new.

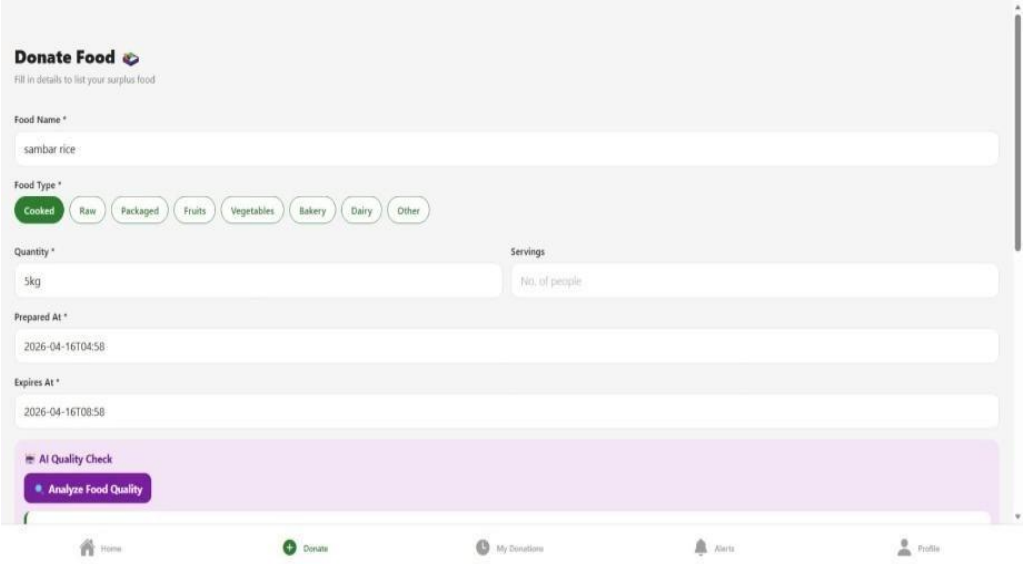

Fig3: Donor Input Interface with AI Quality Integration

This figure3 shows the NGO dashboard of the Food App after user login, displaying a welcome message and activity overview. It includes key metrics like total claims, active requests, delivered items, available food, and total donors.

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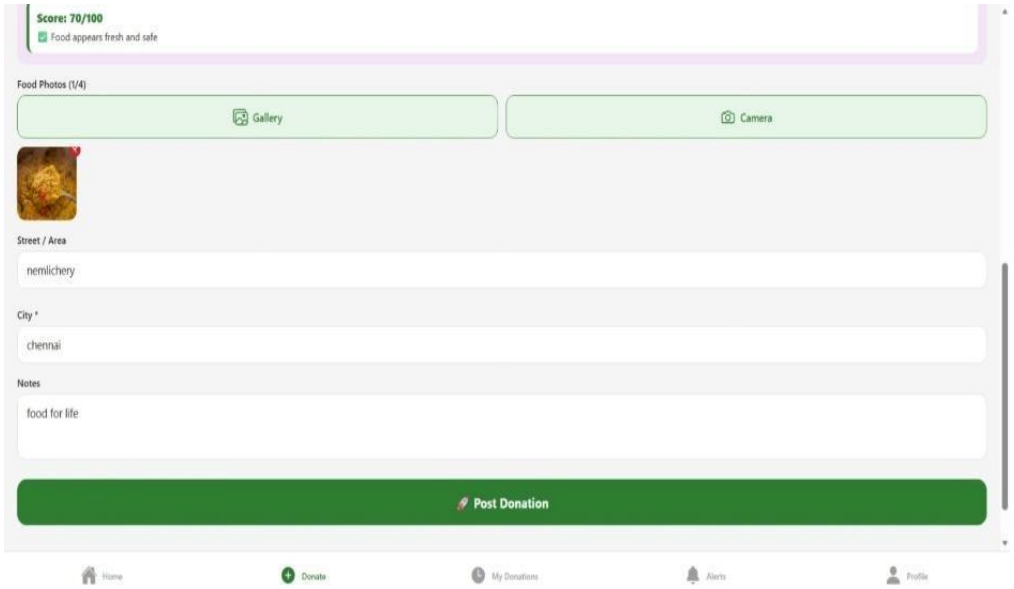

Fig4: Post Donation Workflow Interface

This figure4 displays the final steps of a food donation post, showing a fresh-and-safe quality score of 70/100 based on an uploaded photo. It includes location fields for the street and city, along with a notes section, to help coordinate the pickup.

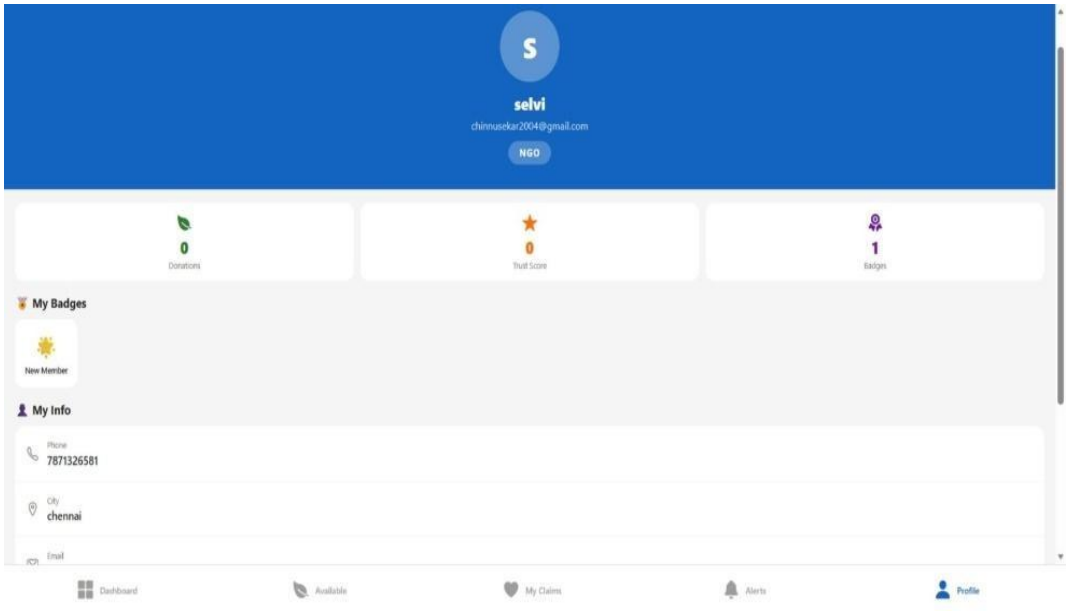

Fig5: Profile Management Dashboard Showing User Information and Badges

This figure5 shows a user profile dashboard for an NGO member named Selvi.It displays key details like donations, trust score, badges, and personal information such as phone number and city.

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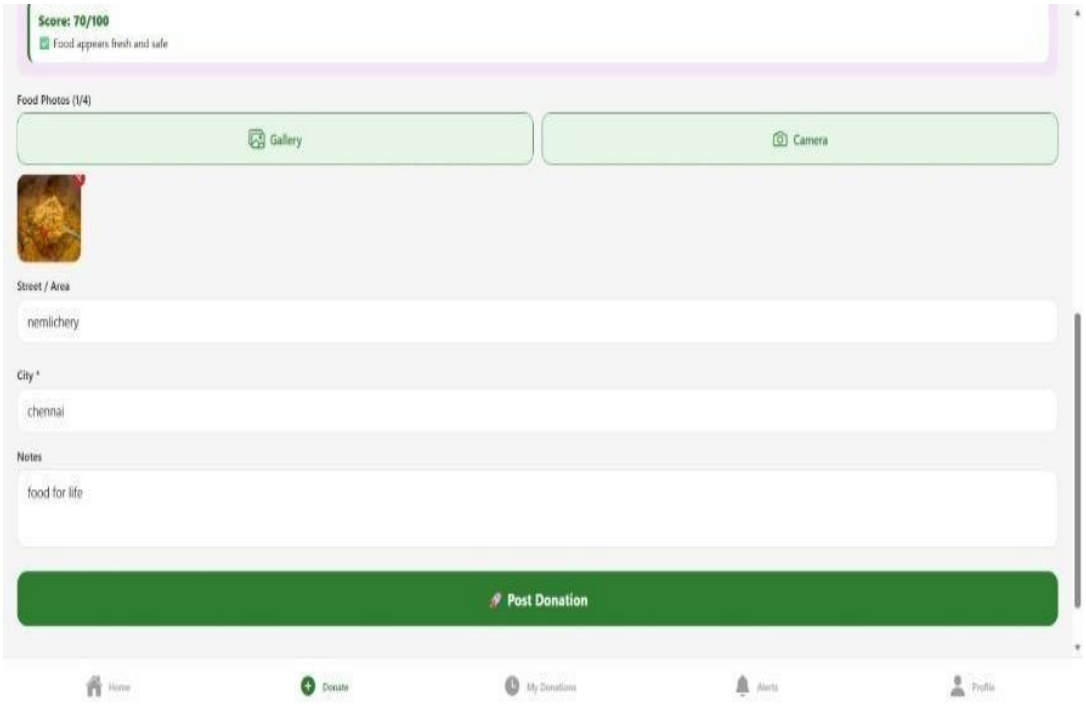

Fig6: Post Donation Workflow Interface

This figure6 displays the final steps of a food donation post, showing a fresh-and-safe quality score of 70/100 based on an uploaded photo. It includes location fields for the street and city, along with a notes section, to help coordinate the pickup.

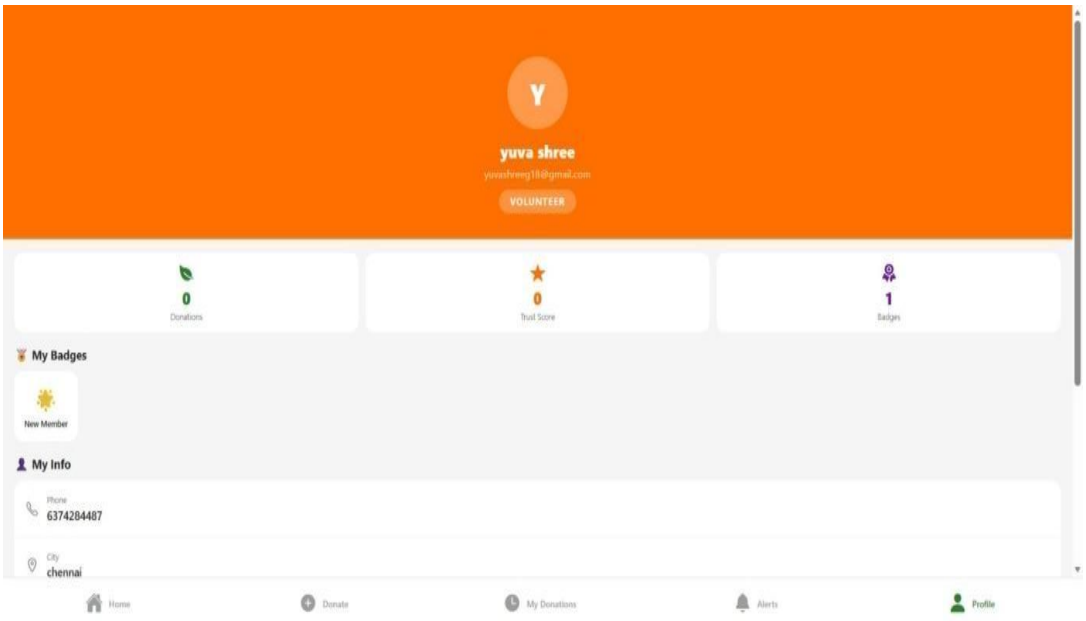

Fig7: Donor Dashboard and Profile Management Interface

This figure7 shows the User Profile page for a volunteer, displaying key metrics such as total donations, trust score, and earned badges. It features a gamified "My Badges" section to encourage engagement, currently highlighting a "New Member" status.

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Fig8: Sustainable Contribution Leaderboard

This figure8 shows the Top Food Heroes" Leaderboard, a core component of the platform's gamification strategy designed to incentivize volunteer participation.

VI. CONCLUSION AND FUTURE ENHANCEMENTS

This research successfully developed Food Linker, an optimized, multi-modular framework designed to mitigate global food waste through intelligent redistribution. The core contribution of this work is the integration of PCA-enhanced machine learning, which allowed for an 85.89% reduction in data dimensionality without compromising system reliability. Empirical results demonstrate that the model achieves a 98.65% testing accuracy with a significantly low inference latency of 22 ms, making it highly suitable for real-time deployment on resource-constrained mobile hardware. By bridging the gap between surplus providers and NGOs through automated quality verification and real-time visualization, this system provides a scalable, technologically robust solution to enhance food security and promote a sustainable circular economy**.**

Future developments will focus on integrating IoT sensors for real-time environmental monitoring and blockchain technology to ensure transparent, immutable tracking of donations. Additionally, we aim to implement predictive analytics to forecast surplus food "hotspots," allowing for proactive resource allocation. These advancements, combined with the expansion of our AI models to detect a wider variety of food categories, will further enhance the scalability and global impact of the redistribution network.

REFERENCES

1. L. Pimple, S. Ambulkar, V. Sandalwar, B. Mendhe, and H. Dadmal, "Food Donation Management System with Real-Time User Data Tracking," International Journal on Advanced Electrical and Computer Engineering, vol. 14, no. 01, ISSN: 2349-9338, 2025.
2. Padmapriya, V. M., Thenmozhi, K., Hemalatha, M., Thanikaiselvan, V., Lakshmi, C., Chidambaram, N., & Rengarajan, A. (2025). Secured IIoT against trust deficit-A flexi cryptic approach. Multimedia Tools and Applications, 84(9), 5625-5652.
3. Mathew, A., Jackson, E., & Tobesman, A. (2025). Agentic AI: A Game-Changer in Cybersecurity Defense. Science and Technology: Developments and Applications Vol. 7, 112-120.
4. Poornima, G., & Anand, L. (2025). Medical image fusion model using CT and MRI images based on dual scale weighted fusion based residual attention network with encoder-decoder architecture. Biomedical Signal Processing and Control, 108, 107932.

|ISSN: 2322-0163| www.ijeetr.com | A Bimonthly, Peer Reviewed, Scholarly Indexed Journal |

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DOI:10.15662/IJEETR.2026.0803002

5. Jaiswal, M., Manchattahalli, U. R., Devi, V. S., & Jacob, M. S. (2026, January). Predictive Analysis of Internet Use and Risk Among Children and Adolescents via Machine Learning. In 2026 Sixth International Conference on Advances in Electrical, Computing, Communications and Sustainable Technologies (ICAECT) (pp. 1-6). IEEE.
6. S. Sadafule, A. Bandale, S. Pawar, P. Sharma, and T. Motes, "The Food Oasis: Web Application for Food Sharing," Abhivruddhi Journal, MIT University, vol. 4, ISSN: 2584-1025, Jun. 2024.
7. Sanjay, P., Vardhan, Y. H., Raja, S. Y., Krishna, V. M., Nirmala, B., Saravanan, M., & Dharnasi, P. (2026). Disaster Management and Earthquake/Tsunami Prediction System Using Machine Learning and Deep Learning. International Journal of Research Publications in Engineering, Technology and Management (IJRPETM), 9(2), 540-548.
8. Aarthi, K., Thirumoorthy, P., Tamizharasu, K., Manoja, R., Kalyanasundaram, P., & Rajasekar, M. (2025, September). Improved Network lifetime using Cluster based Power-Aware Balanced Routing Protocol for Device to Device Communication. In 2025 6th International Conference on Electronics and Sustainable Communication Systems (ICESC) (pp. 1005-1010). IEEE.
9. Mathew, A. (2025). Human–AI Collaboration in Security Operations: Measuring Alert Trust, Automation Bias, and Analyst Upskilling in AI-Augmented SOC Environments. International Journal of Computer Technology and Electronics Communication, 8(5), 11375-11380.
10. Nandhini, T., Surendar, R., Meenakshidevi, P., Sureshkrishna, M., Dharshanadevi, R., & Rajasekar, M. (2024, April). Multi-Source and Multi-Powered Smart Grid Prediction Using Deep Learning. In 2024 International Conference on Science Technology Engineering and Management (ICSTEM) (pp. 1-5). IEEE.
11. Saravanan, K., Sivaramakrishnan, T., Praveenraj, J., Kiruba-Sankar, R., Suma, D., & Devi, V. (2019). Phytochemical, Antioxidant and Antibacterial Activity of Chromolaena odorata from Andaman Islands. India Andaman Sci Assoc, 24(2), 123-30.
12. Kesavan, R., Anuradha, T., Kalaiarasi, P., Jacob, M. S., Anand, A. J., & Devi, V. S. (2025, November). Deep Learning-Based Diagnostic Support System for Breast Tissue Classification Using Mammographic Images. In 2025 IEEE International Conference on Intelligent Signal Processing and Effective Communication Technologies (INSPECT) (pp. 1-6). IEEE.
13. Pandi Prabha, S., & Rengarajan, A. (2025, February). Decentralized Resource Allocation Model Using Multi-agent Reinforcement Learning for Cloud Environment. In International Conference on Universal Threats in Expert Applications and Solutions (pp. 71-82). Singapore: Springer Nature Singapore.
14. A. Karanth, A. K. Hemareddy, G. T. Chethana, N. Gowtham, and H. V. Magadum, "A Web-Based Food Donation and Redistribution Platform for Efficient Surplus Food Management," International Journal of Computer Sciences and Engineering, vol. 13, no. 12, ISSN: 2347-2693, Dec. 2025.
15. Murugeshwari, B., Jothi, D., Hemalatha, B., & Pari, S. N. (2023). Trust Aware Privacy Preserving Routing Protocol for Wireless Adhoc Network. arXiv preprint arXiv:2304.14653.
16. Seedha Devi, V., Kumar, M. D., & Kumar, C. A. (2026). Flutter-based SOS alert and location tracking application with volunteer assist and rescue. International Journal of Research and Applied Innovations (IJRAI), 9(3), 521–530. https://doi.org/10.15662/IJRAI.2026.0903003
17. D. Jethwa, A. Agrawal, R. Kulkarni, and L. Raut, "Food Wastage Reduction through Donation," International Journal of Recent Trends in Engineering & Research, vol. 4, ISSN: 2455-1457, Mar. 2018.
18. A. J. Kadam, S. Ranpise, S. Yadav, R. Nille, and N. Sajnani, "Leveraging Mobile Technology to Bridge Scarcity and Surplus: A Novel Approach to Food Redistribution," vol. 13, ISSN: 2231-6329, 2024.
19. Sharma, K. P., Kumar, I., Singh, P. P., Anbazhagan, K., Albarakati, H. M., Bhatt, M. W., ... & Rana, A. (2024). Advancing spacecraft rendezvous and docking through safety reinforcement learning and ubiquitous learning principles. Computers in Human Behavior, 153, 108110.
20. Jacob, M. S., Rekha, V. B., Manchattahalli, U. R., & Devi, V. S. (2025, October). Enhancing the Performance of Energy-Harvesting Wireless Sensor Networks through Machine Learning-based Energy Prediction. In 2025 10th International Conference on Communication and Electronics Systems (ICCES) (pp. 1558-1563). IEEE.
21. K. He, X. Zhang, S. Ren, and J. Sun, "Deep Residual Learning for Image Recognition," in Proc. IEEE Conf. Computer Vision and Pattern Recognition (CVPR), 2016.
22. Vimal, V. R., Anandan, P., & Induja, V. (2024). Estimating the perspicacious features of ECG recording based on template classification for detecting atrial fibrillation. International Journal of Advanced Intelligence Paradigms, 29(1), 17-27.
23. Sugumar, R. (2025). Secure and Explainable AI Systems in Cloud-Based Applications: Bridging Trust and Performance. International Journal of Engineering & Extended Technologies Research (IJEETR), 7(4), 10328-10335.
24. Devi, V. S., & Ravi, T. (2016). Cluster head election algorithm in wireless sensor network using artificial bee colony. Asian Journal of Research in Social Sciences and Humanities, 6(10), 2173-2182.

|ISSN: 2322-0163| www.ijeetr.com | A Bimonthly, Peer Reviewed, Scholarly Indexed Journal |

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DOI:10.15662/IJEETR.2026.0803002

25. A. Krizhevsky, I. Sutskever, and G. E. Hinton, "ImageNet Classification with Deep Convolutional Neural Networks," in Advances in Neural Information Processing Systems, vol. 25, 2012.
26. J. Redmon, S. Divvala, R. Girshick, and A. Farhadi, "You Only Look Once: Unified, Real-Time Object Detection," in Proc. IEEE CVPR, 2016.
27. Seedha Devi, V., Nivedha, S., Harisha, V., Mol, D. R., & Janaranjini, J. R. (2026). Enhanced prediction of PCOS and PCOD using deep learning for early diagnosis and clinical risk stratification. International Journal of Advanced Research in Computer Science & Technology (IJARCST), 9(3), 783–793.
28. Devi, V. S., Kumar, G. S., Jacob, M. S., Jeevitha, S., & Jegatheesan, A. (2025, October). Comparative Study of Traditional and Deep Learning Approaches for Human Ear-Based Biometric Identification. In 2025 2nd International Conference on Software, Systems and Information Technology (SSITCON) (pp. 1-6). IEEE.
29. Raj, T. S., Thangam, S. A., Balakrishnan, T. S., Ponnaian, G., & Vimal, V. R. (2025, July). Improving Object Detection in Low Light Surveillance Using Hybrid Image Fusion Techniques Over Traditional Filtering Methods. In 2025 2nd International Conference on Computing and Data Science (ICCDS) (pp. 1-6). IEEE.
30. C. Zhang, R. Wohlhueter, and H. Zhang, "A Review of Food Freshness Detection Using Machine Learning Techniques," Journal of Food Engineering, 2020.
31. Food and Agriculture Organization (FAO), "Global Food Loss and Food Waste Report," United Nations, 2019.
32. J. Lubura et al., "Food Recognition and Food Waste Estimation Using Convolutional Neural Network," Electronics (MDPI), ISSN: 2079-9292, 2022.
33. Loganayagi, S., Hemavathi, R., & VR, V. (2024, March). IoT-driven energy consumption optimization in smart homes. In 2024 International Conference on Trends in Quantum Computing and Emerging Business Technologies (pp. 1-5). IEEE.
34. Sugumar, R. (2025). Designing Resilient and Scalable Cloud-Native Frameworks for Generative AI Content Production. International Journal of Research Publications in Engineering, Technology and Management (IJRPETM), 8(6), 13268-13279.
35. Bhaskar, L., & Yamuna Devi, C. R. (2023). Performance Analysis of Classic LEACH Versus CC-LEACH. In Computer Vision and Robotics: Proceedings of CVR 2022 (pp. 75-83). Singapore: Springer Nature Singapore.
36. Rajasekar, M., Mukil, A., & Lakshamanan, R. (2024, August). Segmentation and evaluation of multiple sclerosis in flair modality MRI with ResUNet. In AIP Conference Proceedings (Vol. 3161, No. 1, p. 020314). AIP Publishing LLC.
37. A. K. Manikanta and N. Malarvizhi, "AI-Powered Food Waste Reduction System Using YOLOv8," in Proc. IEEE International Conference on Smart Structures and Systems, 2025.