



BOREALIS AI

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Project Proposal

Reducing Food Waste in Urban Areas Using Machine Learning

Our project aims to develop an AI-powered food waste reduction platform that combines predictive analytics, personalized recommendations, and logistics optimization.

- **Inventory Tracking:** IoT-enabled smart fridges and manual input options for households, restaurants, and stores to monitor food inventory and expiry dates.
- **Personalized Suggestions:** AI-generated recipes and storage tips based on user data.
- **Redistribution Network:** ML-optimized hyperlocal logistics to connect surplus food with food banks and charities.
- **Incentive Mechanisms:** Rewards for users who actively reduce waste or donate surplus food.

WHAT IS THE PROBLEM?

01

Food waste is one of the most pressing issues of our time. Globally, 30-40% of all food produced is wasted, amounting to billions of tons annually. This has dire environmental, social, and economic consequences. Food waste contributes significantly to greenhouse gas emissions, wastes valuable resources like water and energy, and exacerbates food insecurity.

In urban areas, the problem is particularly acute due to the complex dynamics of supply chains, consumer behavior, and logistical inefficiencies. Urban households, restaurants, and grocery stores often generate large amounts of waste because of overbuying, aesthetic standards, or mismanagement of inventory. At the same time, millions of individuals in these cities struggle to access enough food, highlighting the tragic paradox of waste and hunger coexisting.

WHY IS THIS PROBLEM IMPORTANT TO US?

02

Food waste is a deeply personal issue for us because it affects our community in profound ways. Many of us have observed the scale of waste at restaurants, grocery stores, and even in our own homes. Simultaneously, we are aware of individuals and families struggling with food insecurity in our neighborhoods.

The environmental impact also concerns us greatly. We are alarmed by the role food waste plays in contributing to climate change through methane emissions from landfills. Addressing this issue allows us to work toward a more sustainable and equitable urban ecosystem, aligning with our vision of a greener future.

By solving this problem, we aim to:

- Reduce environmental harm.
- Make a tangible impact on food insecurity.
- Promote behavioral changes that foster a culture of sustainability in our community.

WHY MACHINE LEARNING CAN HELP

03

Machine learning is well-suited to tackle food waste because of its ability to analyze large datasets, uncover patterns, and provide actionable insights. Our proposed solution will use ML to:

- **Track Food Inventory:** Predict spoilage and notify users of near-expiry food.
- **Suggest Actions:** Recommend recipes or redistribute surplus food to charities.
- **Optimize Logistics:** Streamline redistribution routes and match donors with recipients efficiently.
- **Engage Users:** Offer personalized incentives and integrate IoT devices like smart fridges for better tracking.

These capabilities will help reduce waste, promote sustainable practices, and improve food redistribution efforts.

WHAT DATA TO USE?

04

Our project will require high-quality data to train machine learning models and validate results. We propose to use the following datasets:

FAO Food Loss and Waste Database:

This comprehensive dataset provides records of food waste generated by households, restaurants, and municipalities. It offers insights into food loss at various stages of the supply chain.

Source: [FAO Food Loss and Waste Database](#)

Other Potential Datasets:

- USDA Food Loss and Waste Data.
- Local urban food waste data from municipal governments.
- Consumer behavior datasets from grocery stores and restaurants.
- IoT device data from smart appliances tracking food inventory.
- NGO reports on food redistribution efforts and outcomes.

We might potentially use these datasets as we fine tune our proposal and figure out how we can use these datasets