DiscountBytes: Off-Season Dynamic Menu Pricing using Machine Learning

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Motivation

Small restaurants face many challenges such as: Razor-thin profit margins (averaging 3–5% net profit), unpredictable customer traffic, and staffing inefficiencies.

During off-peak hours, occupancy drops by 60–70%, leaving staff underutilized and revenue stagnant.

Meanwhile, 82% of independent restaurants fail within their first 5 years due to rising costs and competition.

Our Solution

DiscountBytes is a ML-driven platform that optimizes restaurant operations by enabling dynamic off-peak menu pricing, live crowd monitoring & automated staff management.

Key Features

- Dynamic crowd counting & menu pricing
- Staff clock-in/clock-out automation
- Cloud-accessible admin dashboards
- Customer app with live discounts

Impact for Restaurants and Diners

For Restaurants

- Boost off-peak revenue
- Optimize staffing and operations

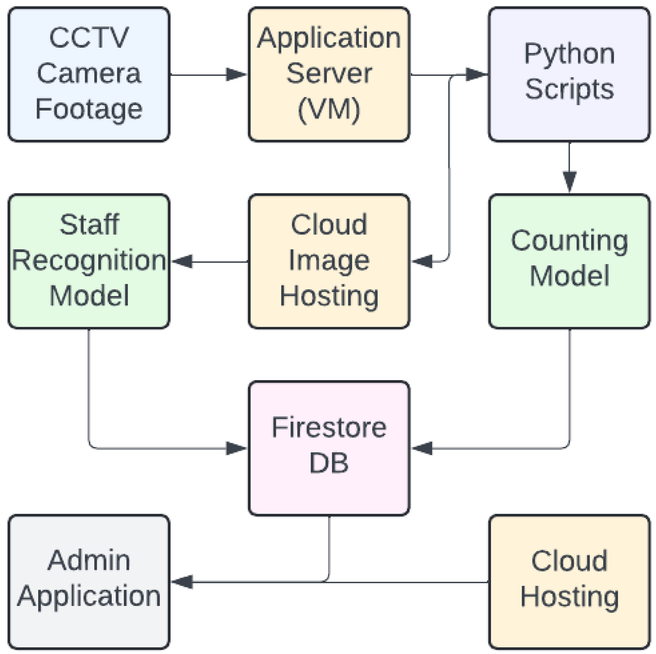
For Diners

- Access real-time dining discounts
- Incentivized to visit during off-peak hours

Methodology

User Side Architecture

Admin Side Architecture

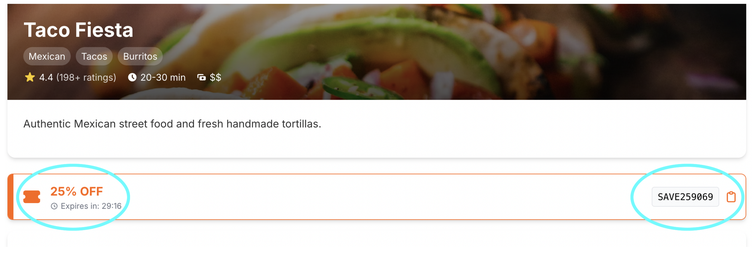


System Requirements

- IP camera supporting RTSP streaming (ReoLink camera provided by us)
- Stable Wi-Fi connection
- Access to a web browser (desktop, laptop, or tablet)
- Cloud servers for backend processing and dashboard hosting (managed by us)

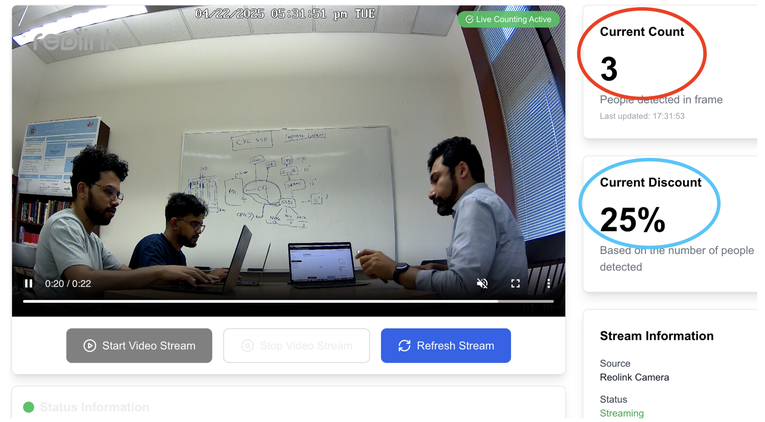
Demonstration

User Application

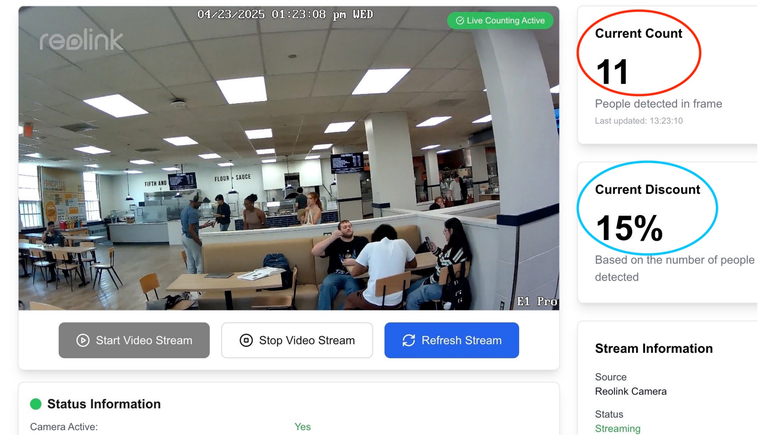


Admin Application

Off-Peak Discount:



Non Off-Peak Discount:



Ongoing Work

We are in contact with restaurants near Trinity for piloting our product. Research is ongoing in implementing multi-camera counting, eliminating blind spots and double counting.

References

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