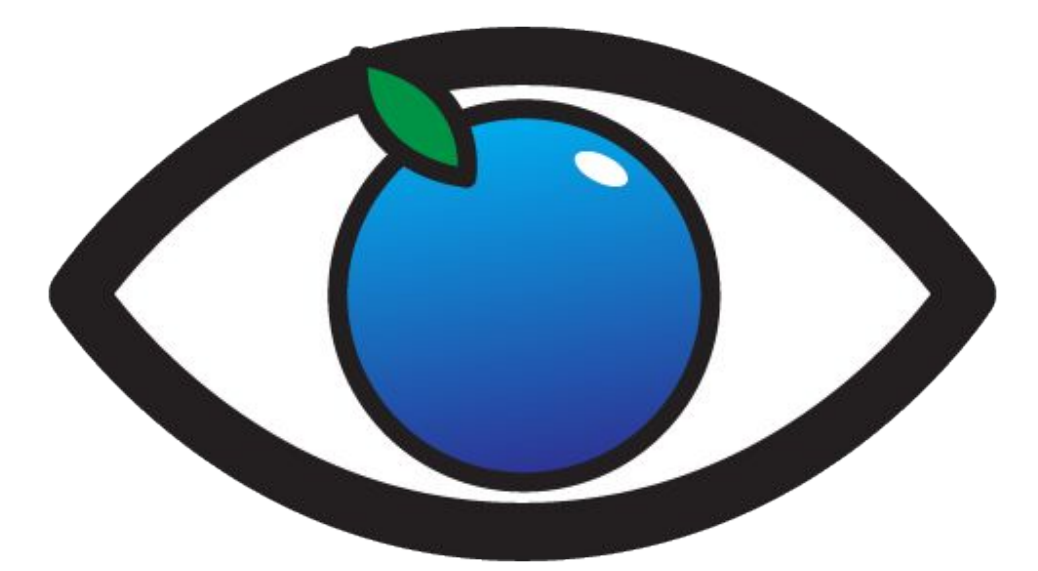# FreshEyes

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18-500 Capstone Design, Spring 2022
Electrical and Computer Engineering Department
Carnegie Mellon University

Product Pitch

FreshEyes keeps track of the items in your fridge and when they expire, so that you can make better use of fresh produce to eat healthier, reduce food waste, and save money.

By making use of state-of-the-art computer vision classifiers, you can quickly place items on the platform, confirm the quantity of items, and then place the item in your fridge.

Finally, the system will remind you when items are going to expire, and give recipe recommendations to take advantage of the expiring items.

System Architecture

Our system comprises 3 main subsystems:

1 Computer Vision — Smart "click-free" **scanning**, with accurate **item classification** & **quantity detection**

2 User Interface — Lets user **confirm scans** & view **expiring items on calendar** from *any* internet device

3 Backend — **Integrates** everything, maintains **item inventory** & handles **notifications**
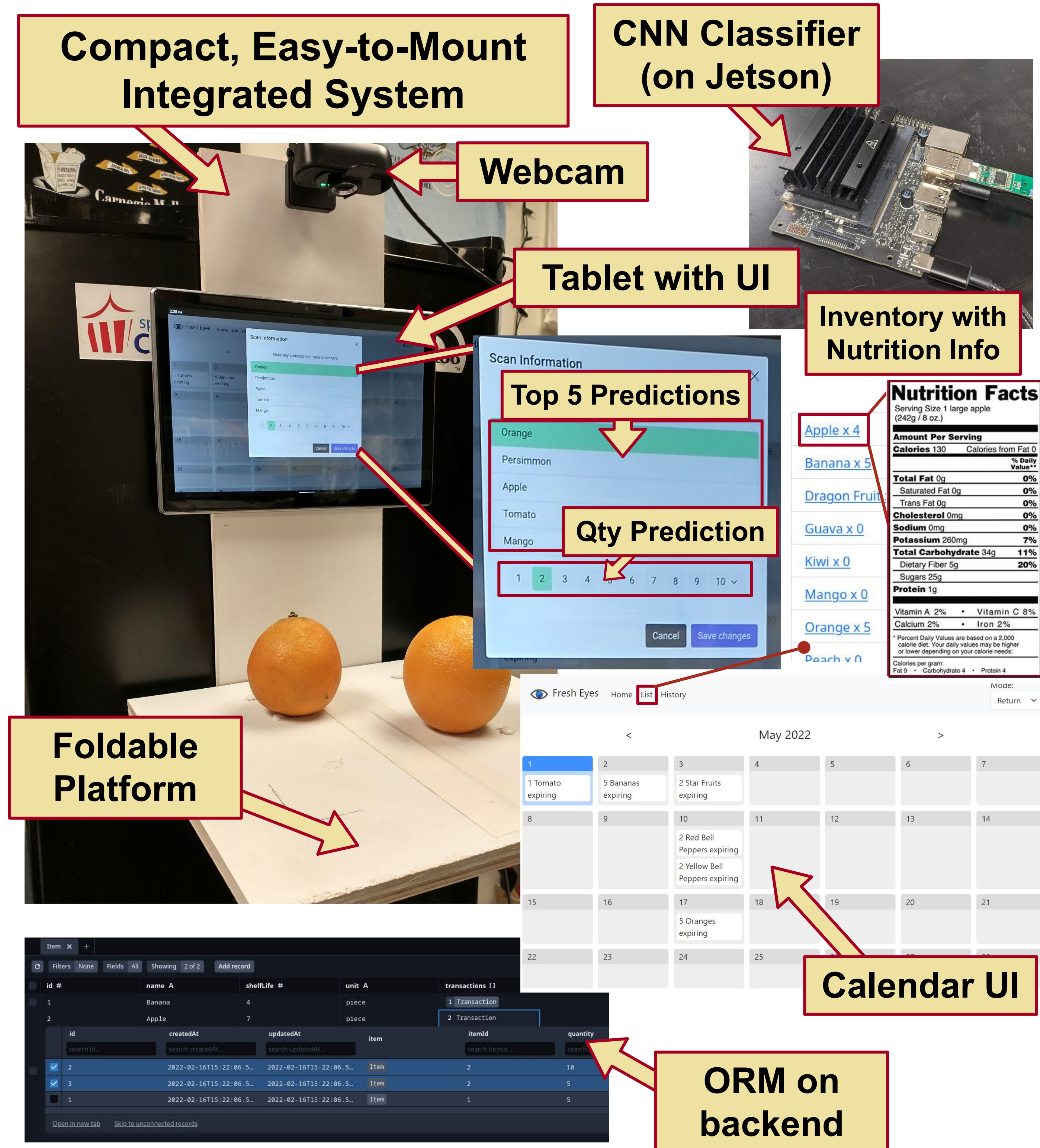

Fresh Eyes Architecture
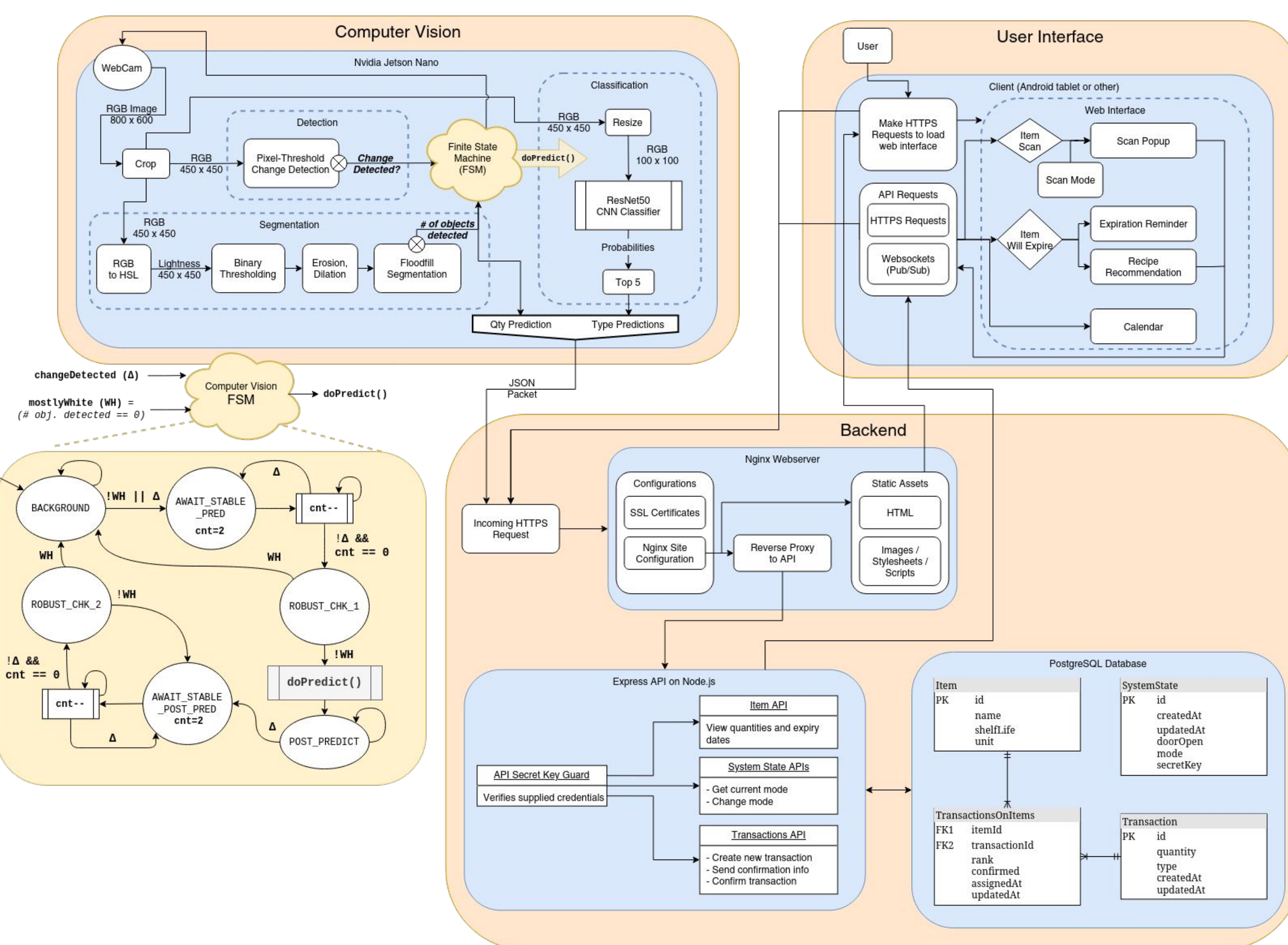
Conclusions & Additional Information

We were able to accomplish most of what we had envisioned at the start of our project. We had some general experience in the area of our project, which allowed us to correctly allocate and schedule time at the beginning. However, we wish there was more time to polish the project even further through improving the user experience, since it can feel a little unintuitive at times with the platform, scanning, and placing in the fridge. Overall, we were able to learn a lot about developing real-world, production, user-facing applications and were able to produce a complete, useful product.

System Description

- Compact, Easy-to-Mount Integrated System
- CNN Classifier (on Jetson)
- Webcam
- Tablet with UI
- Inventory with Nutrition Info
- Top 5 Predictions
- Qty Prediction
- Foldable Platform
- Calendar UI
- ORM on backend

System Evaluation

Our testing and system evaluation process included
- Backend automated tests with Postman to verify response correctness and p99 latency
- CV testing using real fruits, plastic fruits, and varied lighting conditions. 18/20 correct in highest probability prediction, 100% correctness in top 3 highest probability predictions
- Frontend testing on a variety of devices e.g. tablets, PCs, and phones, as well as UI feedback surveys
- End-to-end testing

	Use Case Metric	Requirement	Measured	Status
Computer Vision	Accuracy	85%	90%	✔Achieved!
	Speed	2.00s	1.67s	✔Achieved!
Backend	Latency	750ms	246ms	✔Achieved!
User Interface	Confirmation dialog user response time	2.00s	1.52s	✔Achieved!

Web App

https://capstone.astrasser.com:2096/

Our Blog

http://course.ece.cmu.edu/~ece500/projects/s22-teamb3/

Electrical & Computer ENGINEERING

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