

MICHIGAN STATE
UNIVERSITY

Beta Presentation

DeepOven: Volume and Quantity Estimation in Cooking

The Capstone Experience

Team Whirlpool

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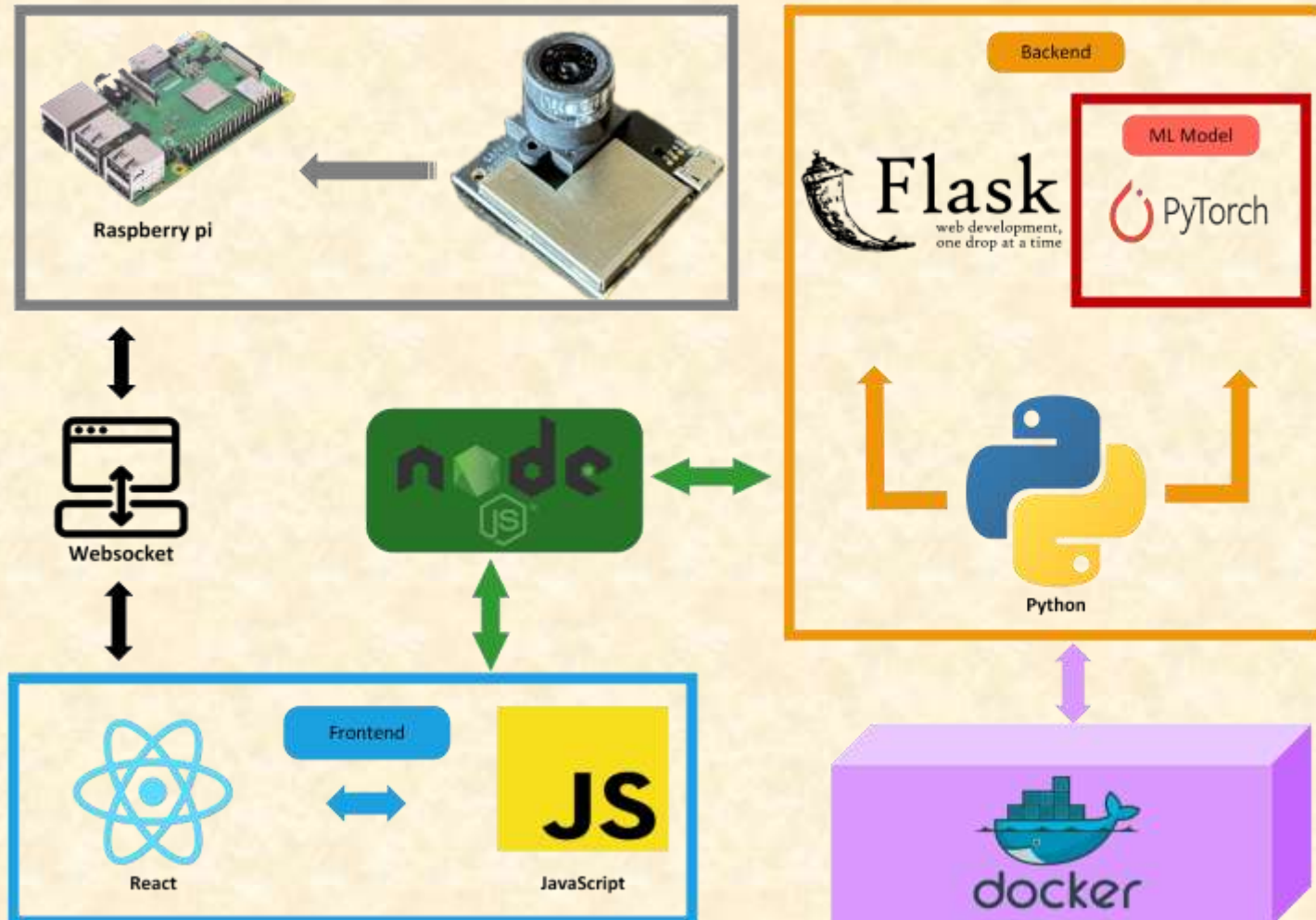
*From Students...
...to Professionals*

Project Overview

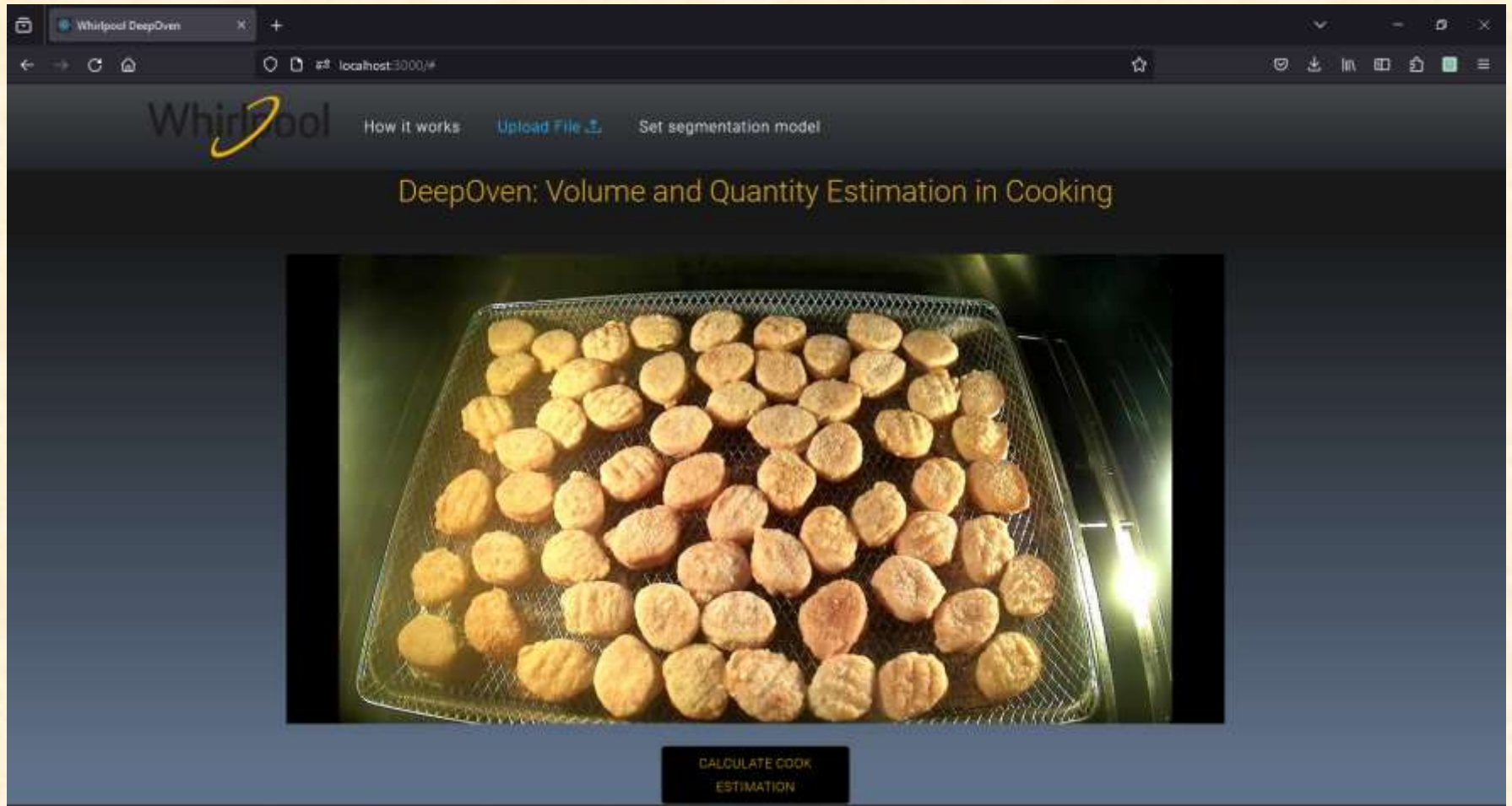
- Whirlpool is creating a smart oven to make cooking easier and more enjoyable for customers
- Livestream view of the cavity from the Whirlpool mobile app
- Food recognition
- Doneness detection
- Initial cook time estimation
- DeepOven is a proof of concept that initial cook time can be estimated
- Software can detect food volume, quantity, and rack level using a camera inside the oven cavity.
- **Visualization of the food volume, quantity, and rack level will be displayed through the web for the Whirlpool development team**



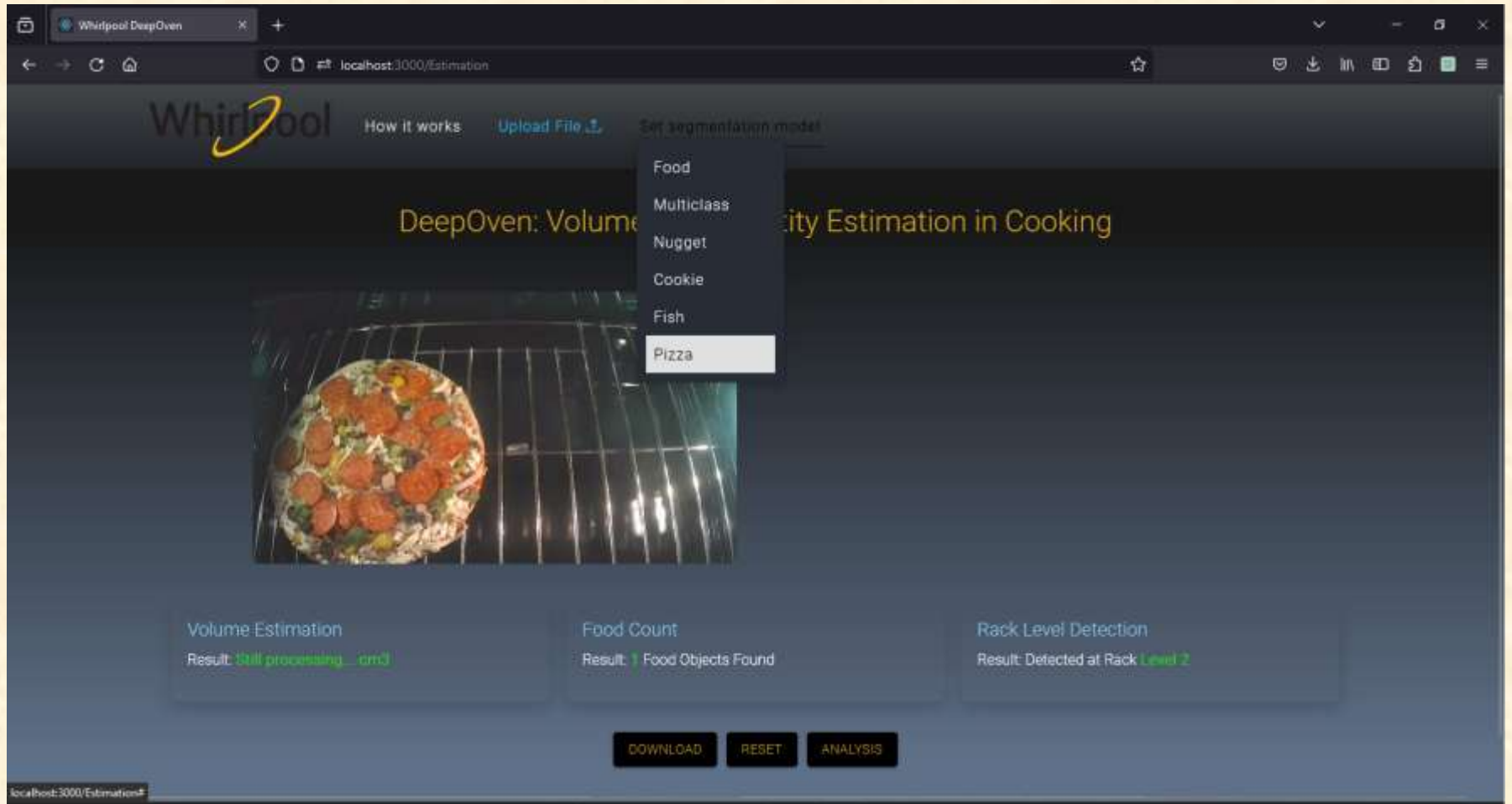
System Architecture



Home Page



Estimation Page



Data Analytics Page

Whirlpool Deep Oven

localhost:3000/DataAnalytics

Whirlpool How it works Upload File Set segmentation model

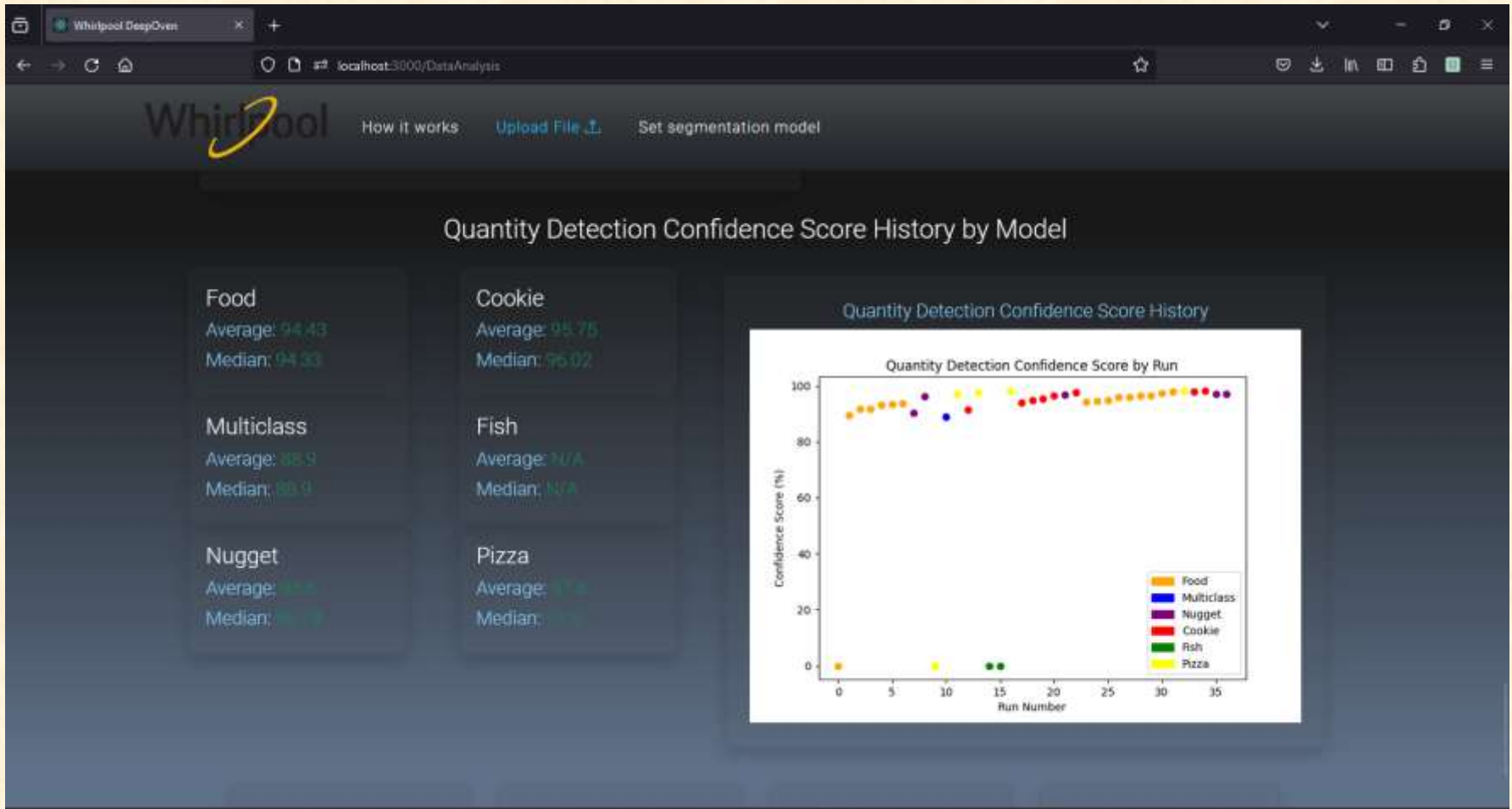
Entry	Volume	Rack Level	Rack Conf	Food Count	Segmentation Conf
11/9/2023 14:32	10	2	97.13	59	93.3
11/9/2023 14:39	10	4	85.18	54	93.07
11/9/2023 14:51	10	N/A	93.6	0	0
11/9/2023 14:57	10	4	100	1	96.53
11/9/2023 15:41	10	4	100	1	96.56
11/9/2023 16:48	10	2	100	11	91.61
11/11/2023 22:31	10	4	98.7	63	93.7
11/11/2023 22:49	10	5	100	20	97.06
11/11/2023 22:52	10	4	98.93	55	96.15
11/12/2023 9:15	10	5	100	0	0

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Confusion Matrices of Rack Level Detection Model



Run History Graphs



What's left to do?

- Features
- Stretch Goals
 - Put together images of food to further test our models
 - Display model performance on another page
 - Stream “oven” video to multiple computers at once
- Other Tasks
 - Measure real food volume to test against the volume model
 - Update the “How it works” page
 - Improve the volume estimation accuracy
 - Finish setting up Docker



Questions?

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