Parking Analysis via Image Processing

Wi-Fight It

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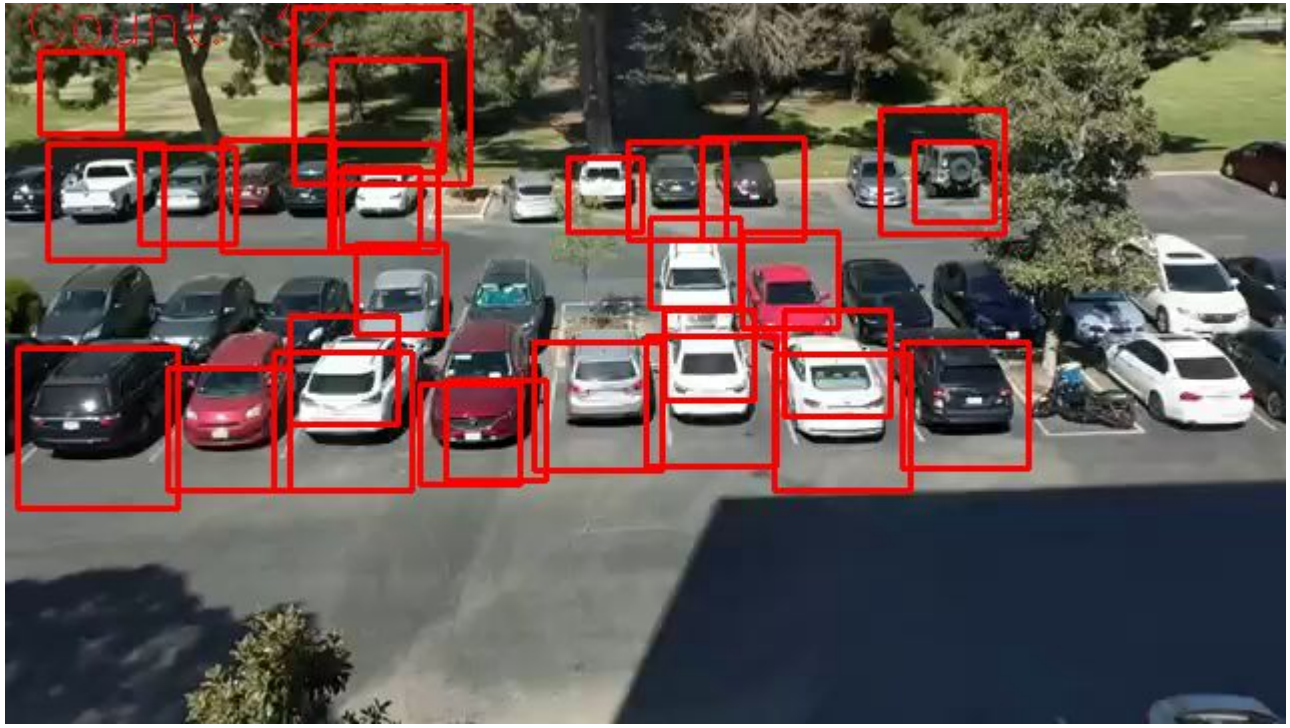
Presentation Outline

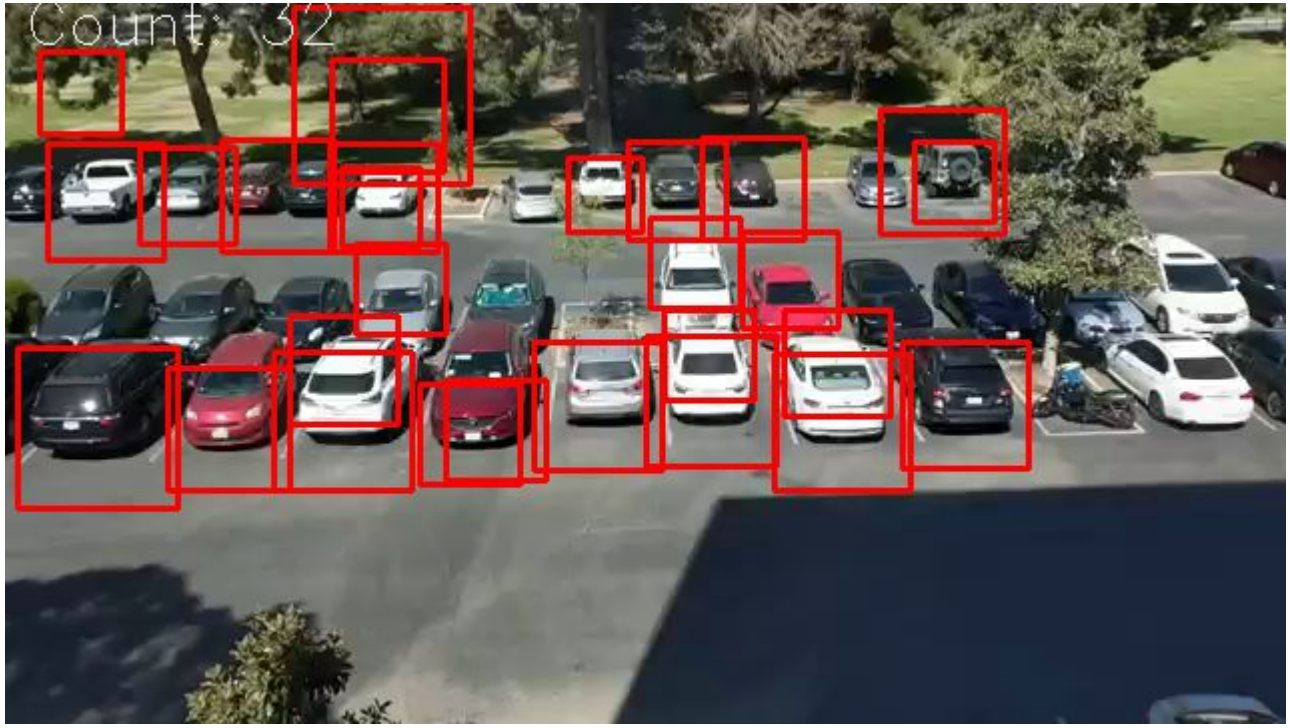
- Detection Attempt History
  - Progress Checkpoints
  - Alternative Techniques
- Raspberry Pi Attempts
- Updated Timeline
- Website Demo

Testing Image

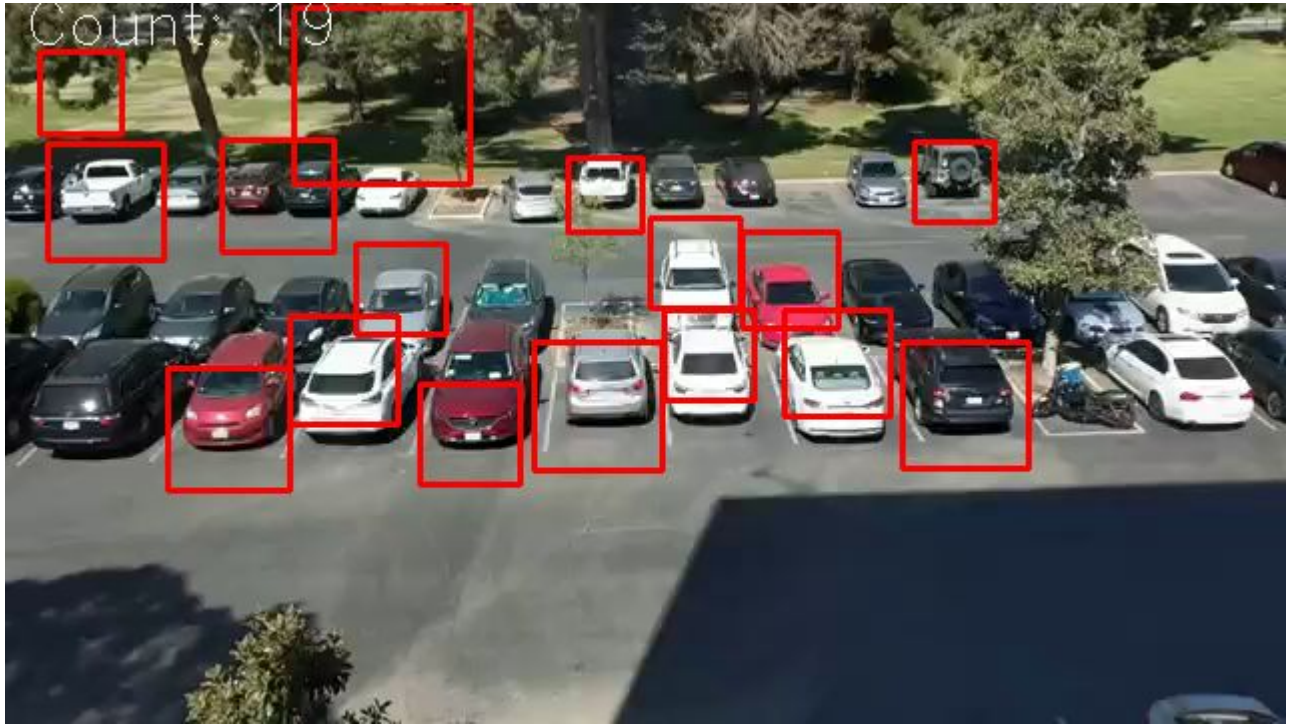
(640x360)



Initial Model Implementation



Faulty Timestamping



Collision Detection

Accurate Timestamping

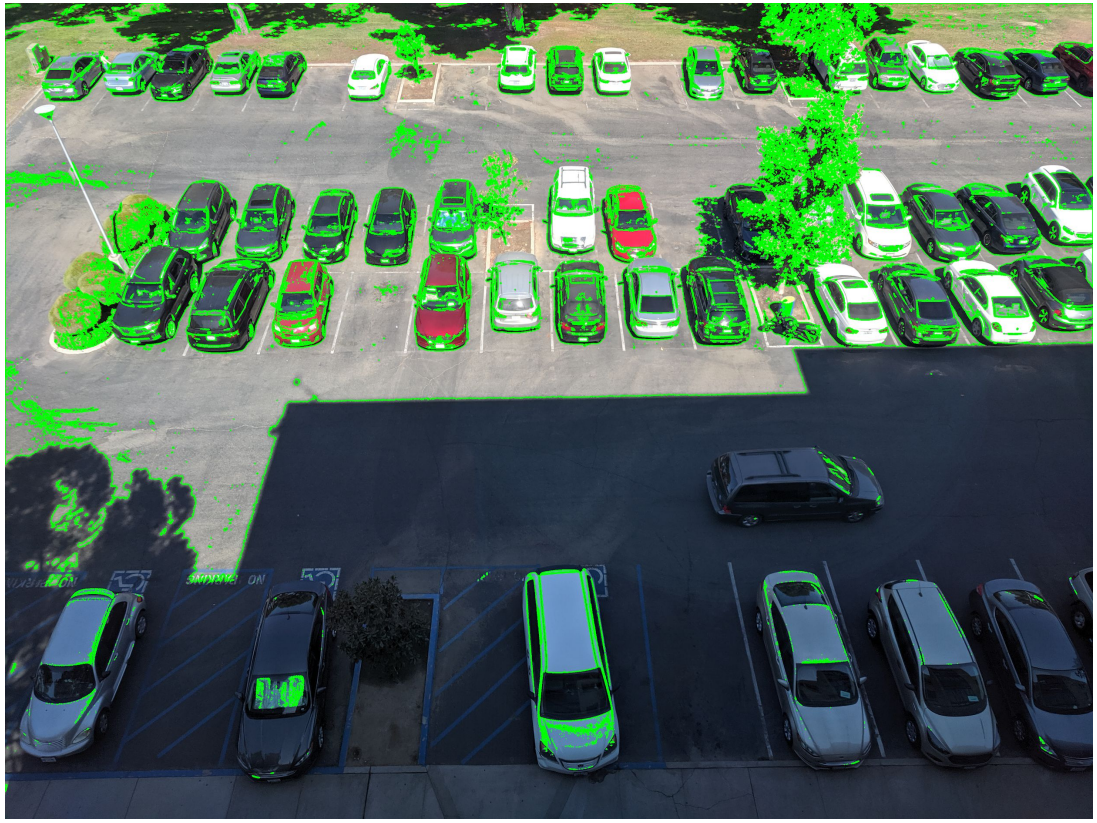
Region of Interest

Contour Detection

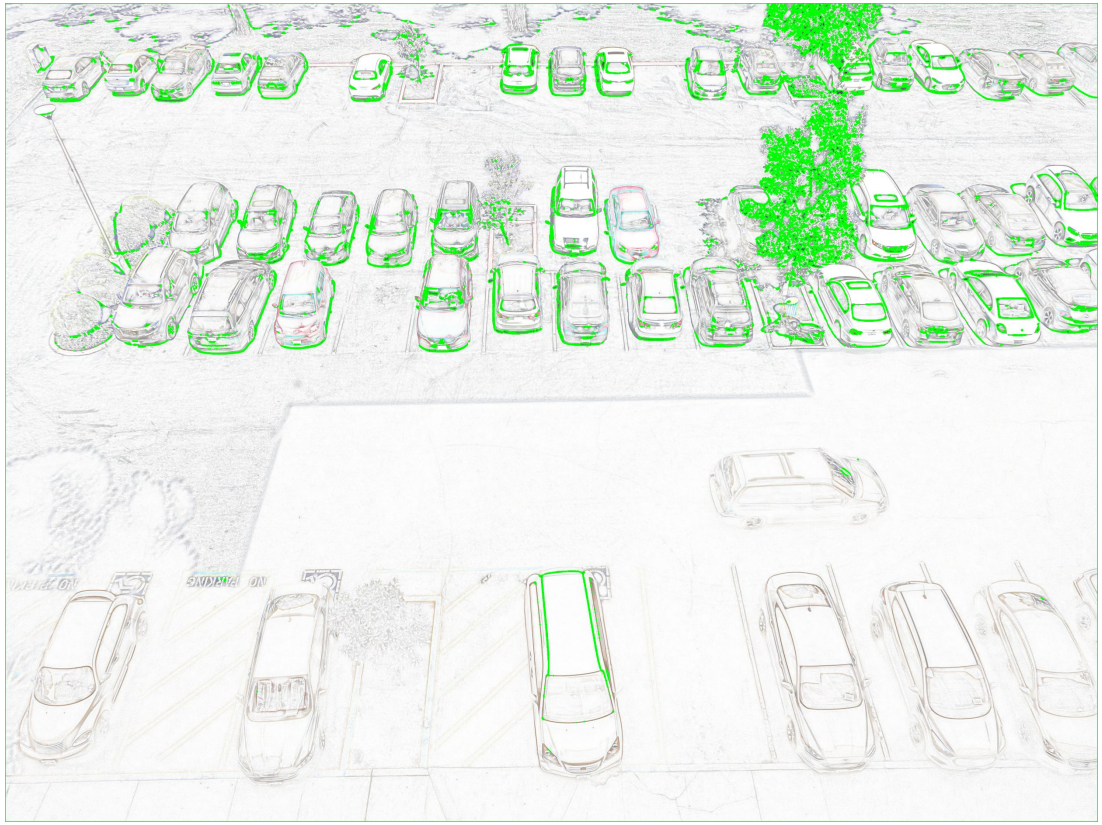
- Approach
  - Detecting contours in image in place of using a haar cascade
  - Approximating car shape based on detected contours
- Issues
  - Shadows

Testing Image

(4048x3036)

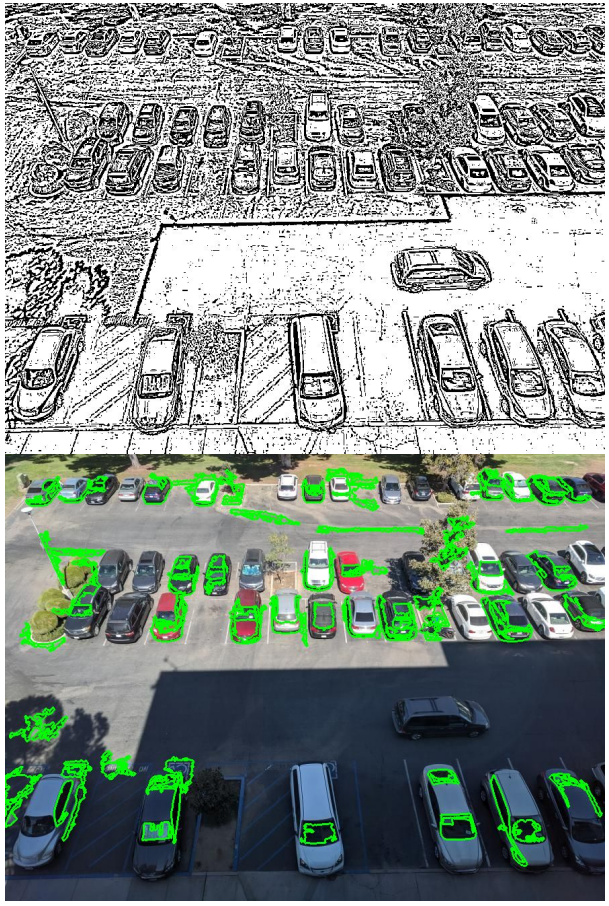


Standard Contouring

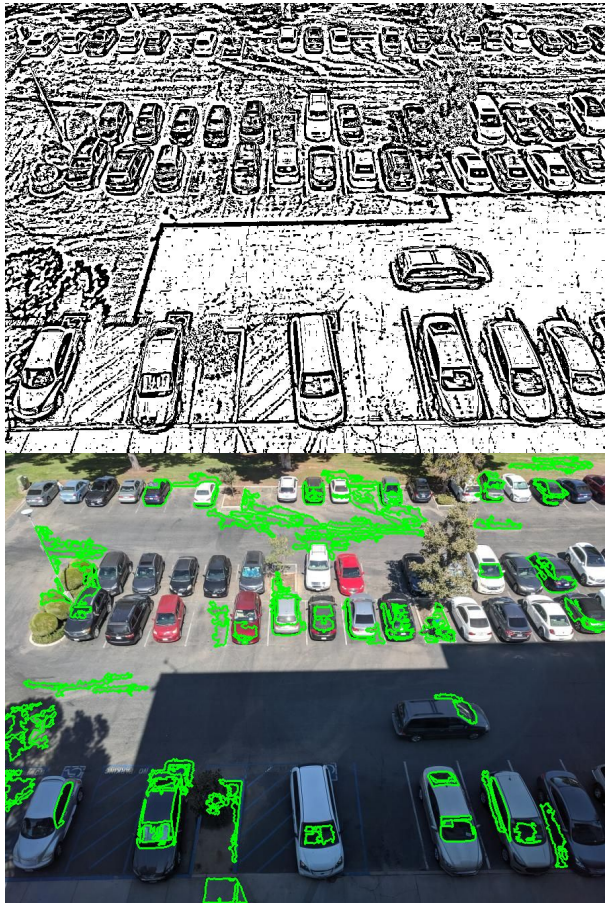


Light Normalization

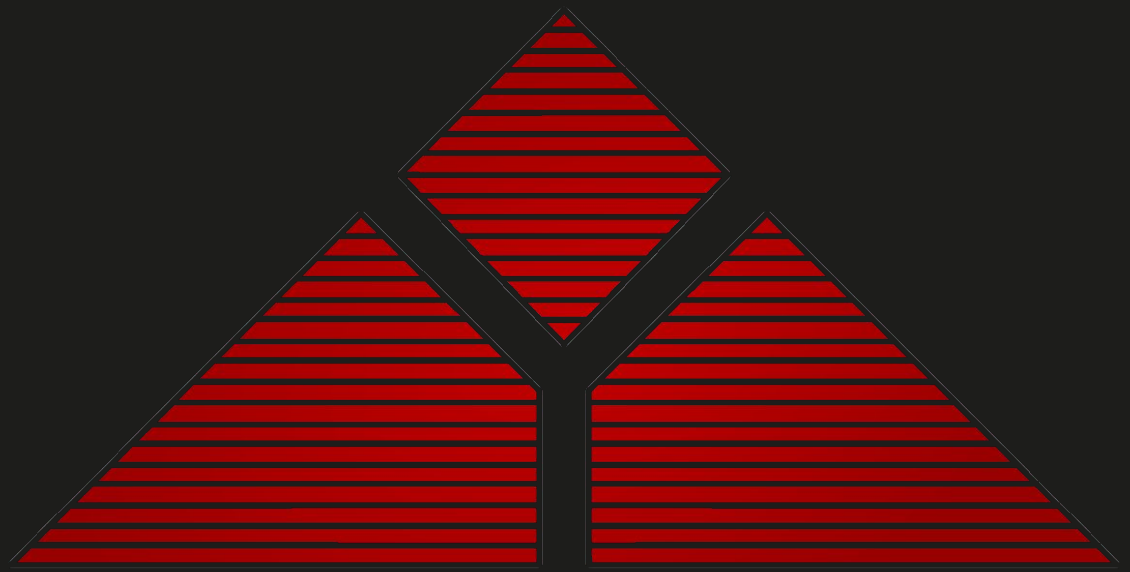
Adaptive Thresholding & Contouring



Gaussian Thresholding



Mean Thresholding



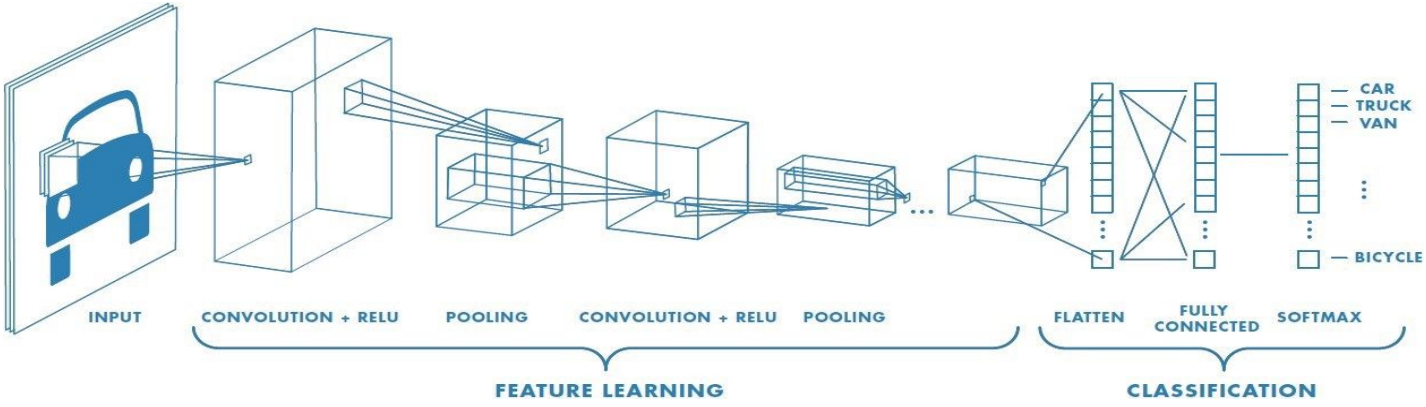
SKYNET

NEURAL NET-BASED ARTIFICIAL INTELLIGENCE

CYBERDYNE SYSTEMS CORPORATION

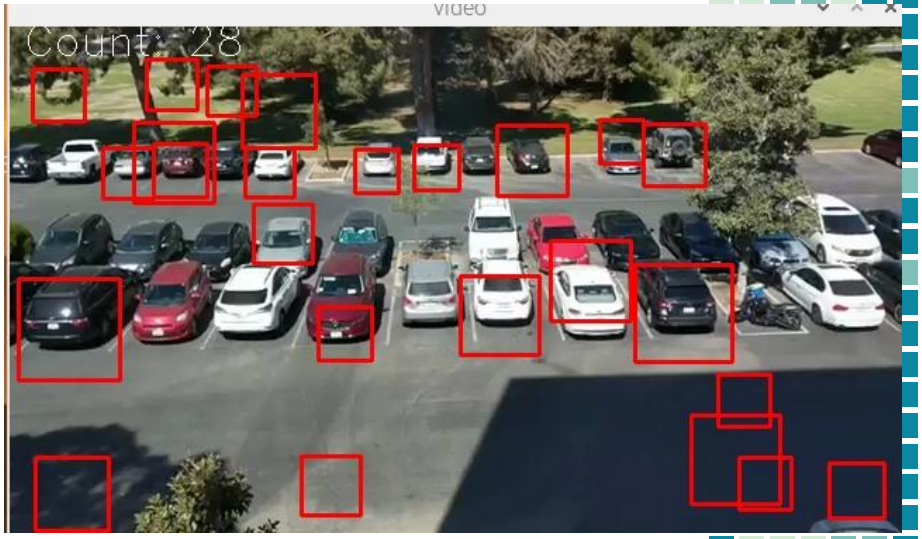
YOLO: Real-Time Object Detection

- Convolutional Neural Network based in tensorflow
  - Tensorflow - Open Source library for machine learning
- Highly computationally intensive
  - A Pascal Titan X processes 30 fps



Hardware Moving Forward

- Raspberry pi
  - 2 frames per minute
- Jetson Nano
  - 3 frames per second



Phase Breakdown

Timeline

I.	Proof of Concept	(Sept.-Oct.)
II.	Program Implementation	(Nov.-Dec.)
III.	Online Interface for Users	(Jan.-Feb.)
IV.	Predictive Models	(Mar.-May)

Updated Timeline

Dec. - Jan.

- Testing Program Implementation on Jetson Nano
- Debugging and Filtering Results

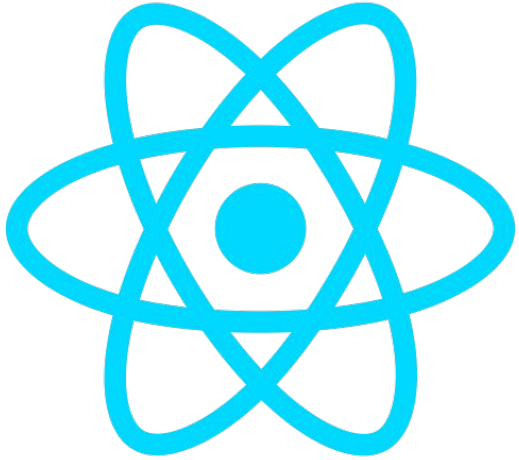
Feb.

- Establish dedicated connection between the front and back ends
- Finalize front end design

Mar. - End of Semester

- Implement and refine predictive model

Front End



Demo Time!