Trademark Analysis & Identification Tool (TRAIT)

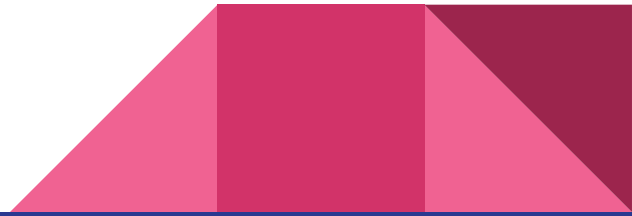
Team 11 Intermediate Presentation Lane Keck, Logan Taggart, Caleb Stewart

Project Overview

TRAIT is a computer vision-based solution designed to help brands, marketing teams, and event organizers measure the visibility of of their brand in visual media.

We analyze images and video footage to:

- Detect and track specific logos
- Measure screen space, screen time, and appearance frequency



Project Overview

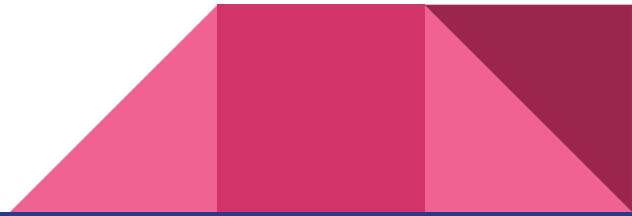
The user will have multiple options for analyzing media:

Generic logo search

- The user will upload one piece of media (image or video)
- Our system will automatically identifies and analyzes all logos present
- User will receive detailed analytics on all detected brand imagery

Specific logo search

- User will upload a main piece of media, as well as a reference logo image
- Our system specifically tracks and analyzes only instances of your selected logo
- User will receive metrics focused solely based on logos found in the reference image



Project Objectives

For Marketing Teams and Brand Owners

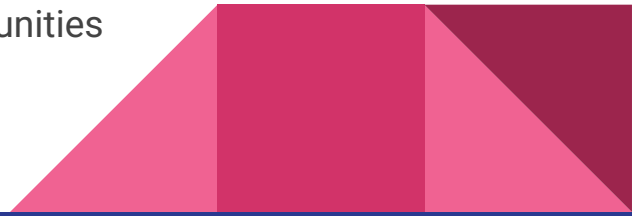
- Track advertisement performance and evaluate ROI
- Compare visibility metrics across different videos/angles
- Analyze brand prominence across difference platforms

For Event Organizers

- Measure exposure of sponsor logos
- Identify optimal advertising spaces
- Provide detailed reports to attract and retain sponsors

For Potential Sponsors

- Analyze visibility in sample footage to evaluate sponsorship opportunities
- Make data-driven decisions about marketing investments



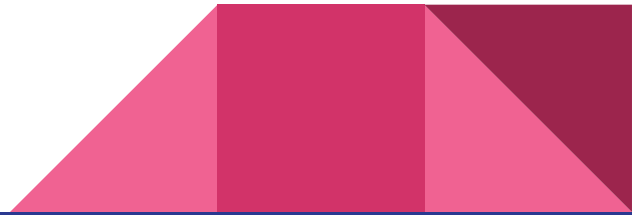
Logo Detection Tool

Successfully trained a YOLOv8 model on the LogoDet-3k dataset

- A dataset of over 200,000 images of multiple logos

Achieved strong performance metrics based on this YOLOv8 model

- 81.03% Precision (accuracy of detected logos)
- 76.73% Recall (percentage of actual logos detected)



Logo Matching System

Because our YOLO model only detects logos, but doesn’t classify them, we needed to create our own logo matching system

We were able to do this by using multiple embedding algorithms (BEiT, CLIP, ResNet)

Using these embedding algorithms, we developed a voting system using both cosine similarity and Euclidean distance

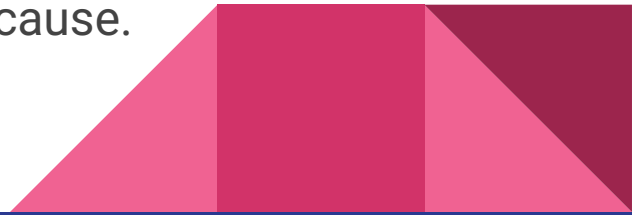
This creates a more accurate matching accuracy by requiring multiple confirmation points.

Evolution of our Project

Initial Proposal:

- Web-based application, using React on the frontend, and Python Flask on the backend
- This would have been hosted with cloud-server platforms

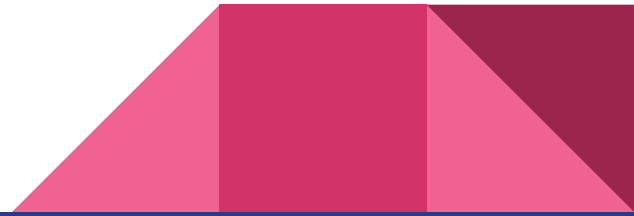
Due to our relatively computationally intensive project, we quickly exceeded the capabilities of the free-tier services from the cloud-servers. To resolve this issue we decided to pivot to a local desktop application so that we did not have to be concerned with any limitations that using a server could cause.



Current Status of our Project

Our application currently is able to process, recognize logos, and then return area metrics for still images

We have used Electron.js to transform our application into a desktop application that runs on Chromium - This means this is no longer a website but appears the same

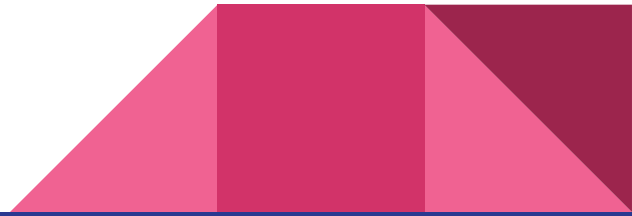


Challenges so far

Training the YOLO model took upwards of 30+ hours

We encountered false positives in our initial logo matching algorithm

Our solution has been computationally expensive, so hosting on free-tier cloud platforms was not feasible.



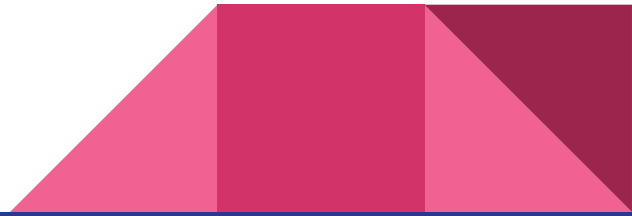
Next Steps

Done with image processing, which was our goal for the winter quarter

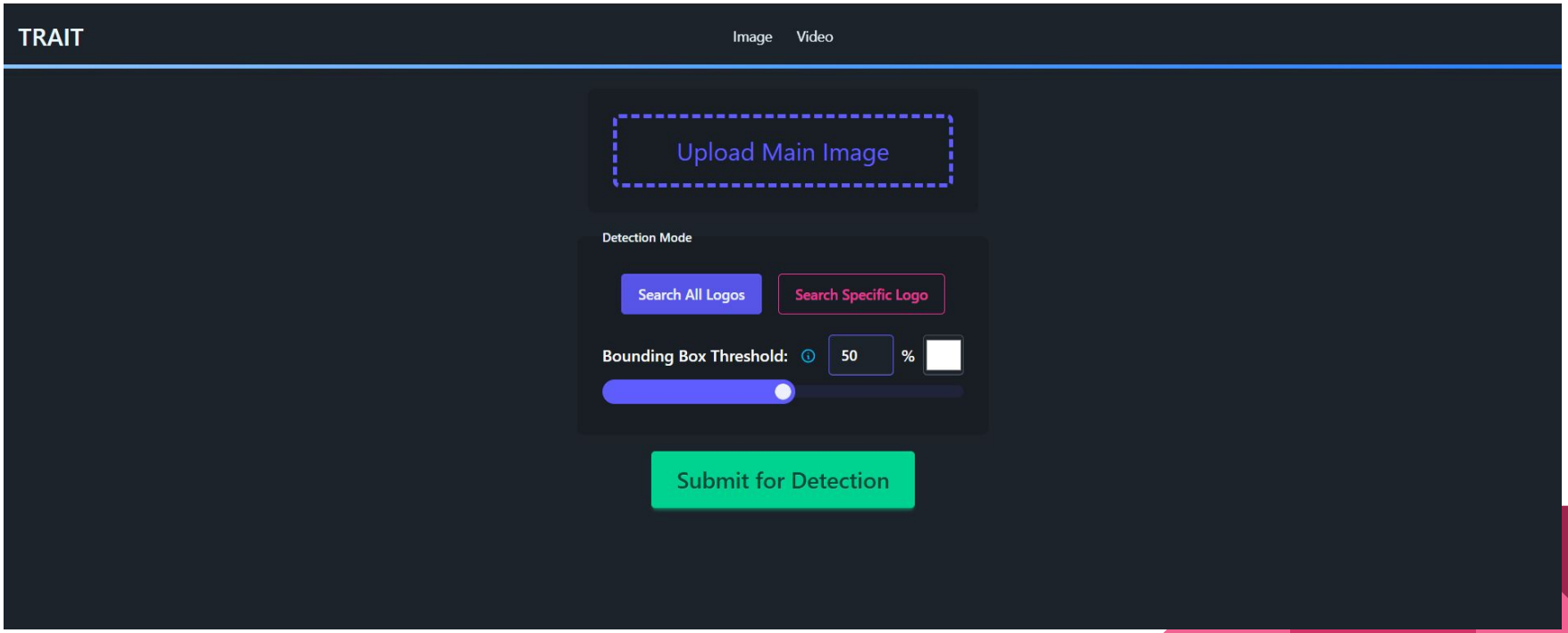
For the spring quarter our focus will be on completing video analysis with metrics of each logo

- Because what is a video? Just a bunch of images!

Slight changes to the frontend design to align with our next steps



Our Application!



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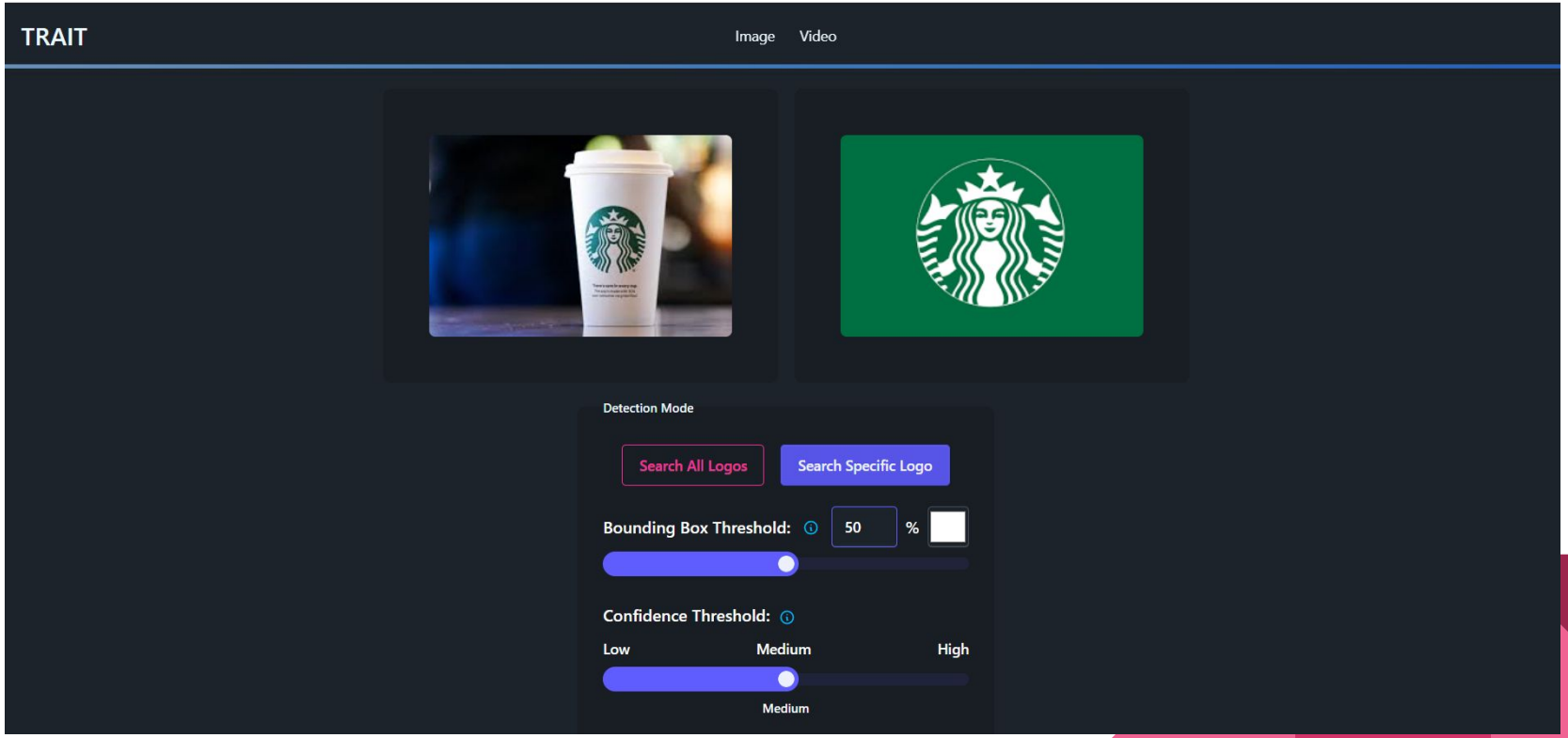
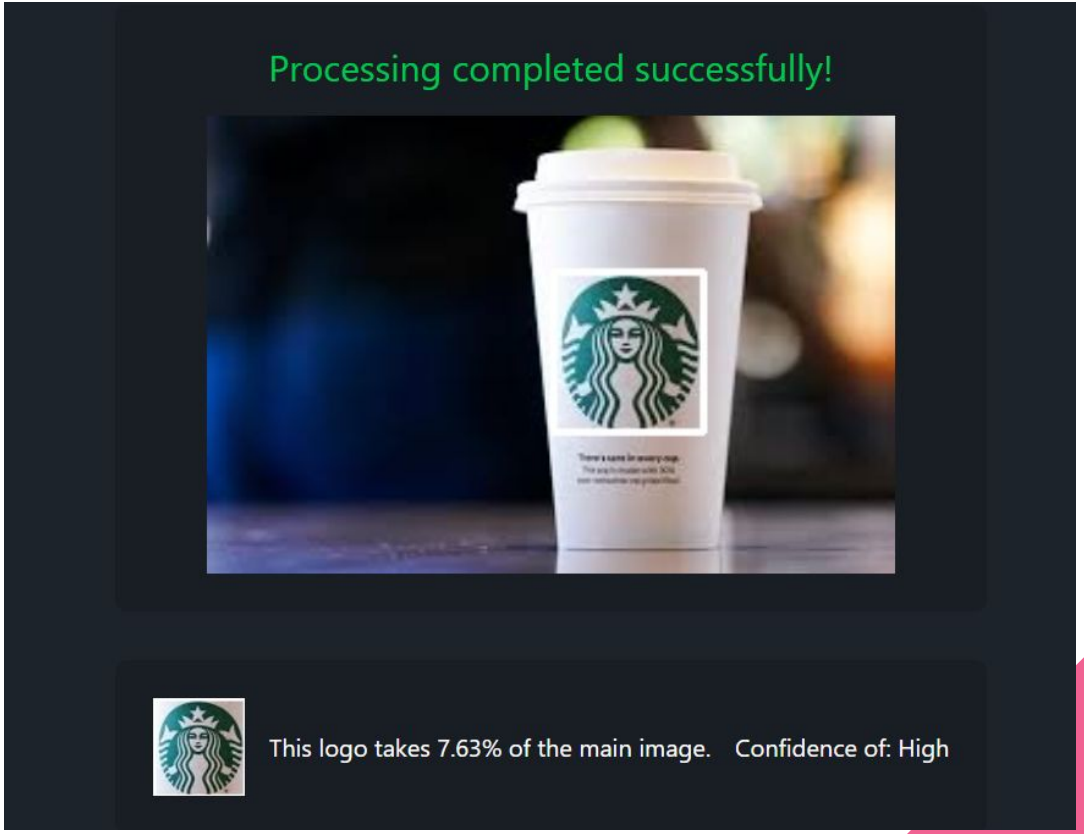
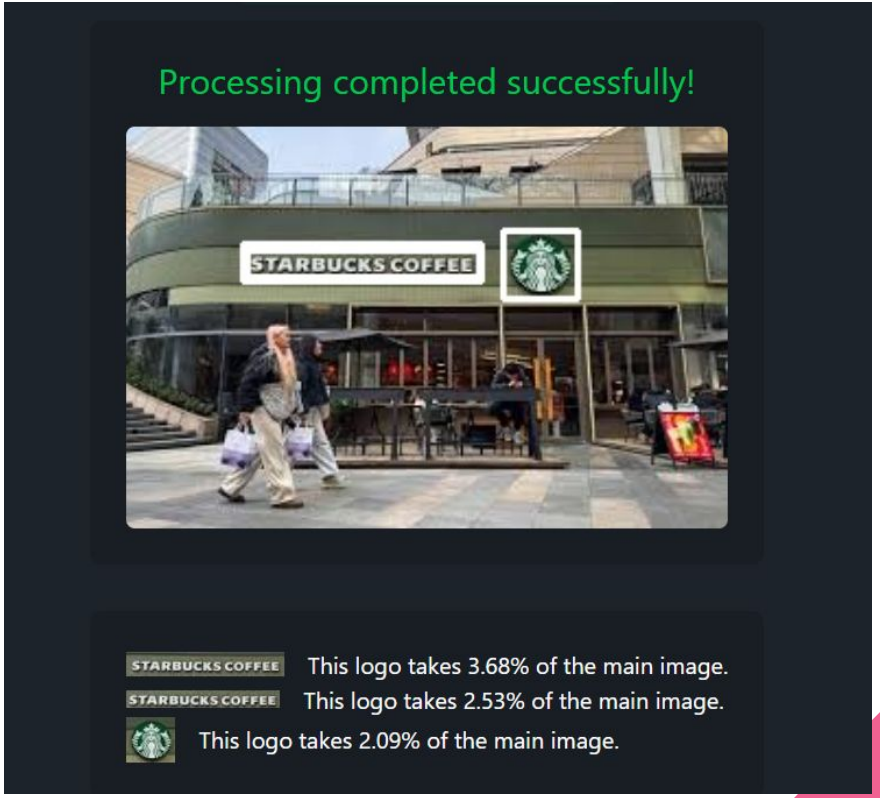


Searching a specific logo



Searching all logos



Logo not detected example