The Team - Aerospace

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The Project

Automatic Image + Video Object Detection and Tracking
Specifications

× **Input:** Target Image, Video Recording

× **Output:** Streamed bounding box location and size. Processed Video

× **Action:** Finds desired object in video and tracks it
User Flow

Start

Go To perceptionengine.com

Select Video and image to upload

Click Process

See results + Video downloads

After video done processing, redirect to 'results' page

See Loading Icon
**Web Interface**

<table>
<thead>
<tr>
<th>HTML/CSS/JS</th>
<th>DropzoneJS/Ajax</th>
<th>Flask</th>
</tr>
</thead>
<tbody>
<tr>
<td>✗ To build out the web page user interface</td>
<td>✗ Adds user upload functionality</td>
<td>✗ Python web microframework</td>
</tr>
<tr>
<td>✗ Minimalistic design</td>
<td>✗ Allows for asynchronous webpage loading</td>
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</tr>
<tr>
<td>✗ Dynamic handling of changes in the Document Object Model (DOM)</td>
<td>✗ JS server side event (listening)</td>
<td>✗ JS server side event (processing)</td>
</tr>
</tbody>
</table>
Server Side

Flask
- User Token Generation
- JS server side event (processing)
- Video Streaming HTML5

Celery/RabbitMQ
- Asynchronous task handling
- Process multiple user requests efficiently
- Broker message passing/storage

YOLO/OpenCV
- Fast Convolutional Neural Network based object recognition module
- Image + Video processing in one step
- OpenCV + CUDA for GPU speed up
Deep Learning with YOLO
Deep Learning with YOLO
Future Plans

- Specificity in Object Detection
- Siamese Neural Network
- Live Video Stream Processing
Thank You