-Computer Vision- Aircraft and other Vehicles

Lex Kim, Hylene Wu, Neel Jay, Jordan Maggin, Zhuo Cheng Xie

Objectives

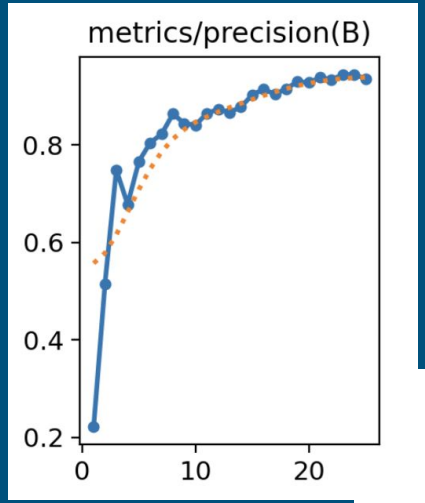
- Initial goal: Create an image classification program based on YOLO that attempts to locate airplanes in images
- Continuation: Build up on previous program by introducing other vehicles (cars, trucks, helicopters)

Methodology

1. Researched architecture best suited for our goal (YOLOv8, OpenCV)
2. Gathered various datasets to test and train the model with (Roboflow, Kaggle)
3. Compiled datasets onto our Roboflow workspace
4. Trained the YOLOv8 model on our datasets (via Google Colab)
5. Created a working GUI with a basic file viewer to apply the model to locally-saved images

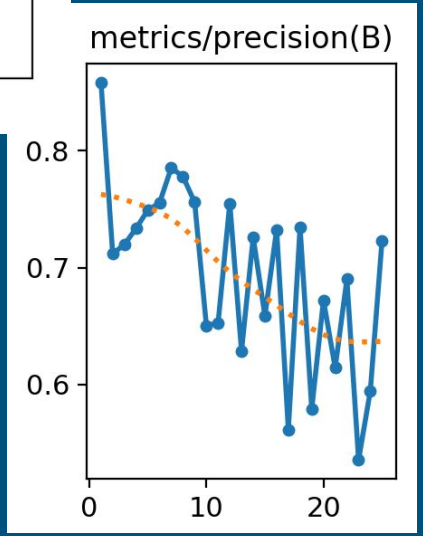
Outcomes

- Aircraft Detection Model
  - Achieved ~93% precision
- Vehicles and Aircraft Detection Model
  - Achieved ~59% precision
- Extra features: functional GUI



<- precision graph for Plane Detection

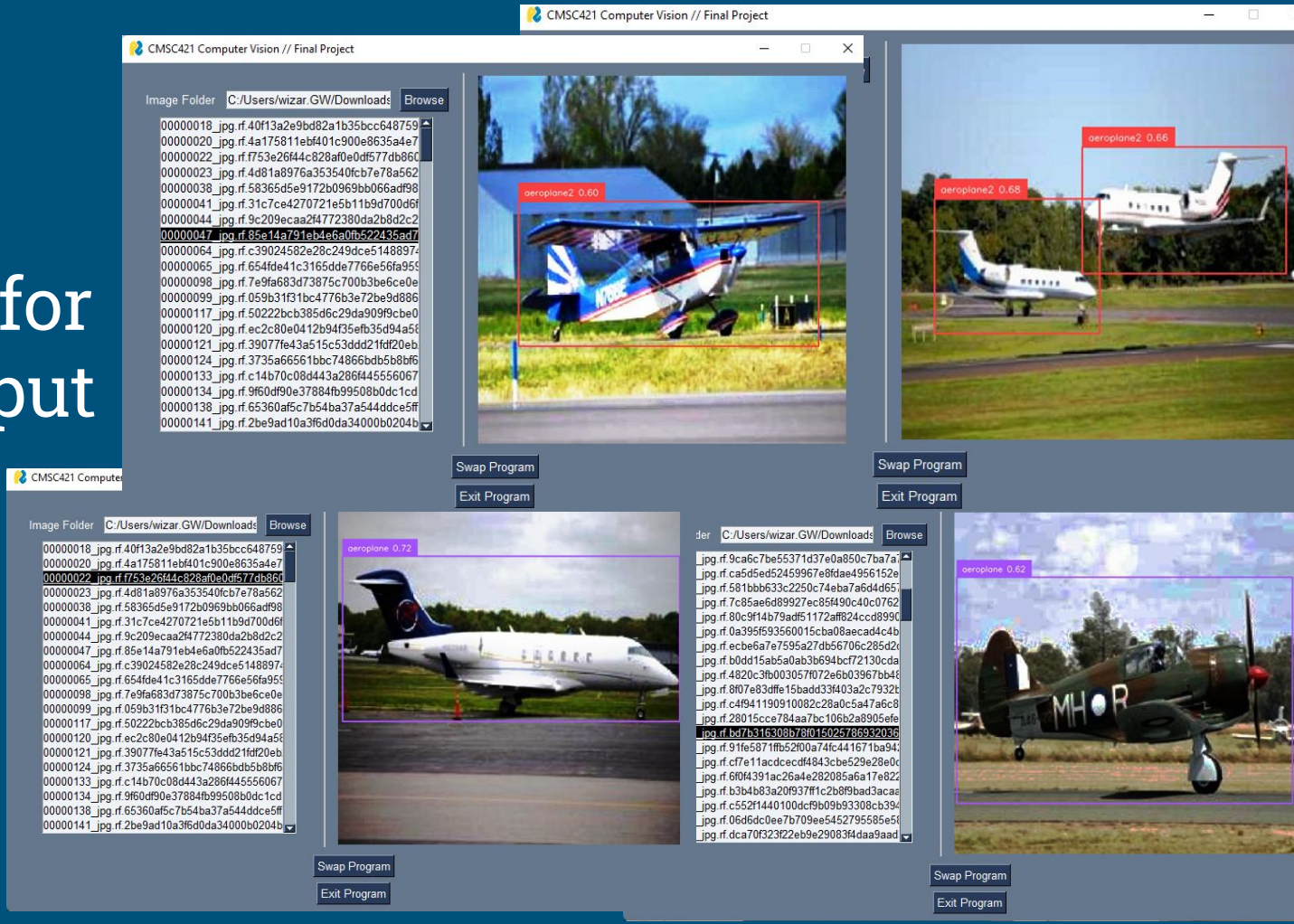
precision graph -> for vehicle detection



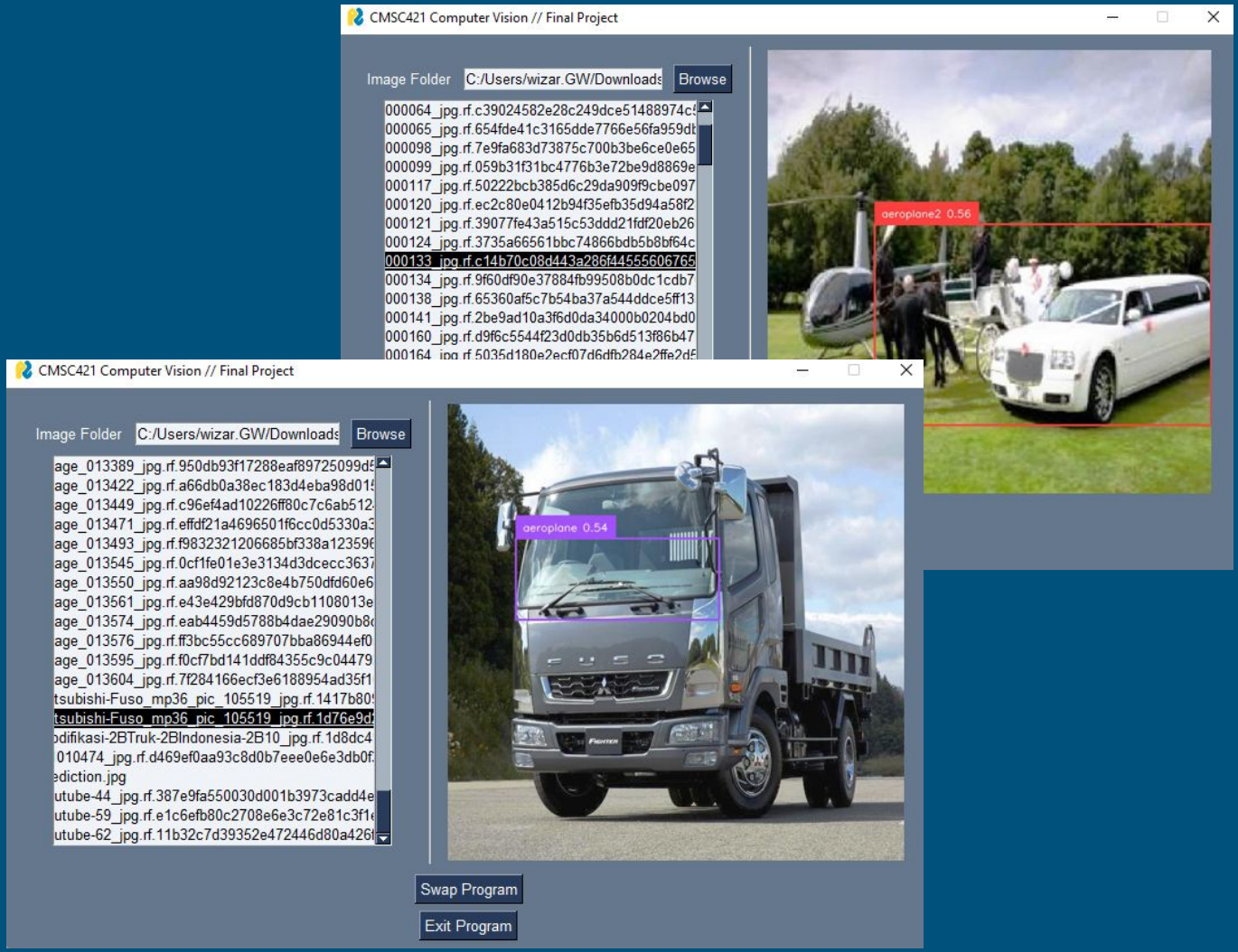
Model on Aircrafts

Model on Multiple Vehicle Classes

Examples for model output with GUI



For Fun: Model Messups!



References

Links to Online Deployment (Roboflow workspace):

- Plane detection/tracking: → https://app.roboflow.com/cmsc421-final-project/plane-detection-eyzak/visualize/2
- Vehicle detection/classification: https://app.roboflow.com/cmsc421-final-project/vehicle-detection-ansgq/visualize/1 →

Example video link: (copy and paste link into model)

- https://www.youtube.com/watch?v=1Lqjy25ZBDc&t=58s&ab_channel=AirshowWorld