# **Weekly Report 5: Image Classification and Identification**

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This week, we made significant progress on our Image Classification and Identification project.

We successfully implemented a **bottle detection and counting system** using the YOLOv8 object detection model. The model was trained on pre-existing weights (yolov8s.pt) and applied to images to detect and count bottles. The system processes images, detects the bounding boxes around bottles, and saves the annotated images with the bounding boxes highlighted. Additionally, it logs the total bottle count for each image in a CSV file. This project demonstrates the practical application of YOLOv8 in real-time object detection tasks, with results stored in a downloadable file for easy access. The model was optimized with a confidence threshold of 0.15, ensuring efficient and accurate detection in varied image conditions.

We also developed an **image processing program for signature extraction** from scanned documents. The process involved multiple stages, including image dewarping, thresholding, and morphological operations to isolate the signature from the rest of the image. Using libraries like OpenCV and skimage, we applied thresholding to convert the image to binary and detect blobs (regions of interest). The largest blob, representing the signature, was then isolated, and small irrelevant objects were removed using morphological techniques. This project focuses on leveraging traditional image processing methods for signature extraction, without deep learning, and proves effective in extracting signatures from scanned documents with high precision.

Overall, the project is shaping up well, with core modules functional and gradually being consolidated under one command-line interface.