Pedestrian AI

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This Computer Vision project detects signs on the road. The model is meant to support blind pedestrians, who wouldn't be able to use their canes to understand these aspects of their surroundings so that they can more safely navigate around. First, data was collected through web scraping on google collab which allowed for gathering 100s of images at once instead of downloading manually. The collected images were then uploaded in folders in google drive based on their class. After the data was collected, 8 classes of road signs were created in Roboflow: go-cross, no-pedestrian, pedestrian-stop-signal, schoolzone-crossing, stop-sign, stop-donotproceed, crossing-sign, and caution. Using Roboflow, all the data was labeled manually. Lastly, multiple models were trained on YOLOv5 until finding the most accurate one. For each training, we also augmented the images in order to increase the diversity of the data set. The final dataset had 1209 images from web scraping. In total, 5 models were trained but training #3 was selected as the best one because it had the most classes with 100% recall, had the highest average recall, and the improvement in precision was nominal in our subsequent training. It was especially important to ensure that the objects were labeled consistently. For example, the caution class repeatedly got low precision because there was too much variation between signs from web scraping. Most caution signs are the yellow triangle with an exclamation mark, but many also had black stripes or were red in color.