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Throughout this past week, I was able to implement full depth sensing into my vehicle crash prediction algorithm. The main problem that I am attempting to tackle with this subproject is that my crash prediction algorithm incorrectly predicts vehicles at drastically different depths to be crashing. This is best illustrated in Figure 1 which depicts a motorcycle-car crash. Here, both the motorcycle and car are correctly labeled (with a red box) as being crashed, however, there is a car in the background that is incorrectly labeled as also being apart of the crash. Thus, I had to create an algorithm that would effectively filter out these incorrect crashes. In order to do this, my algorithm checks whether vehicles that are predicted as being crashed are at a close enough depth. I am still working on a sophisticated means of determining what constitutes "close enough" but for now I check whether the absolute difference in relative depths is less than 0.15. The results of this "filtering" are depicted in Figure 2. Here, only the motorcycle and car are labeled as being crashed. This is because the relative depths of the motorcycle and car are 0.9999 and 1.0000, while the car in the background is at a relative depth of 8.1544. The relative depths of the vehicles in Figure 2 are displayed above their bounding boxes. In the coming weeks, I am going to translate what I have learned from my linear vehicle crash prediction algorithm and explore Machine Learning classifiers that can assist in this task. Specifically, I will look into Recurrent Neural Networks (RNNs) which have been proven to have a heightened performance on chronological data.

Fig 1. Without Depth Sensing

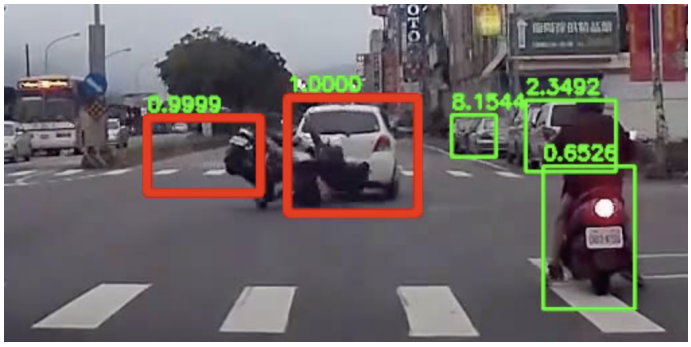

Fig 2. With Depth Sensing