Writeup Instructions

While most of the mid-term project requirements revolve around code, it's important not to skip over the part of Step 1 Part 2 that involves additional details to be included within a write-up.

When the code is functional, you are supposed to use the viewer to locate and closely inspect point-clouds on vehicles and write a short report that includes the following items:

Find and display 10 examples of vehicles with varying degrees of visibility in the point-cloud
Identify vehicle features that appear as a stable feature on most vehicles (e.g. rear-bumper, tail-lights) and describe them briefly. Also, use the range image viewer from the last example to underpin your findings using the lidar intensity channel.
You may include your write-up either as a markdown file (while also including the related image files) or PDF file. You may also add any additional discussion and visualizations to your write-up as desired, but to pass the project, you will need to include at least the above. You may also consider adding in your performance metrics, but that is not required.

Midterm Project Writeup

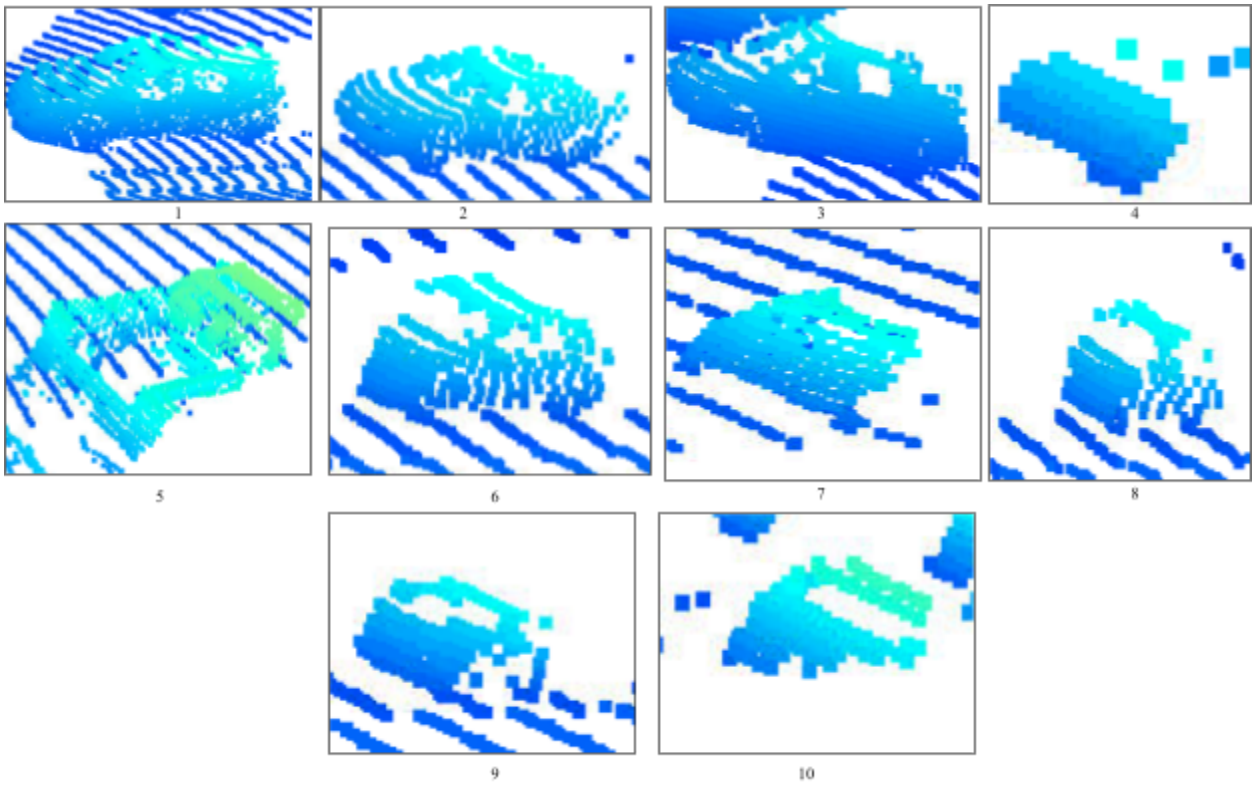

Figure 1: Ten examples of vehicles with varying visibility in the point cloud

The first instance in Figure 1 shows a fairly good representation of a car and the visibility of the vehicle in the point cloud decreases for later instances. Some relevant features like windshields, wheels, and body frames of the vehicles can be clearly seen in instances 1-6 and are shown in Figure 2. The rear side of a

pickup vehicle is also interpretable by looking at instance 5 and is shown in figure 3. Distant objects tend to show less features than the closer objects which makes sense as the intensity of the reflected light for distant objects decreases due to environmental conditions as seen in instances 8-10 from Figure 1.

Figure 2: Range image showing relevant features in different vehicle

Figure 3: Range image showing a pickup trailer

Figure 4: Range image with a clear front bumper and wheel

Additional Analysis

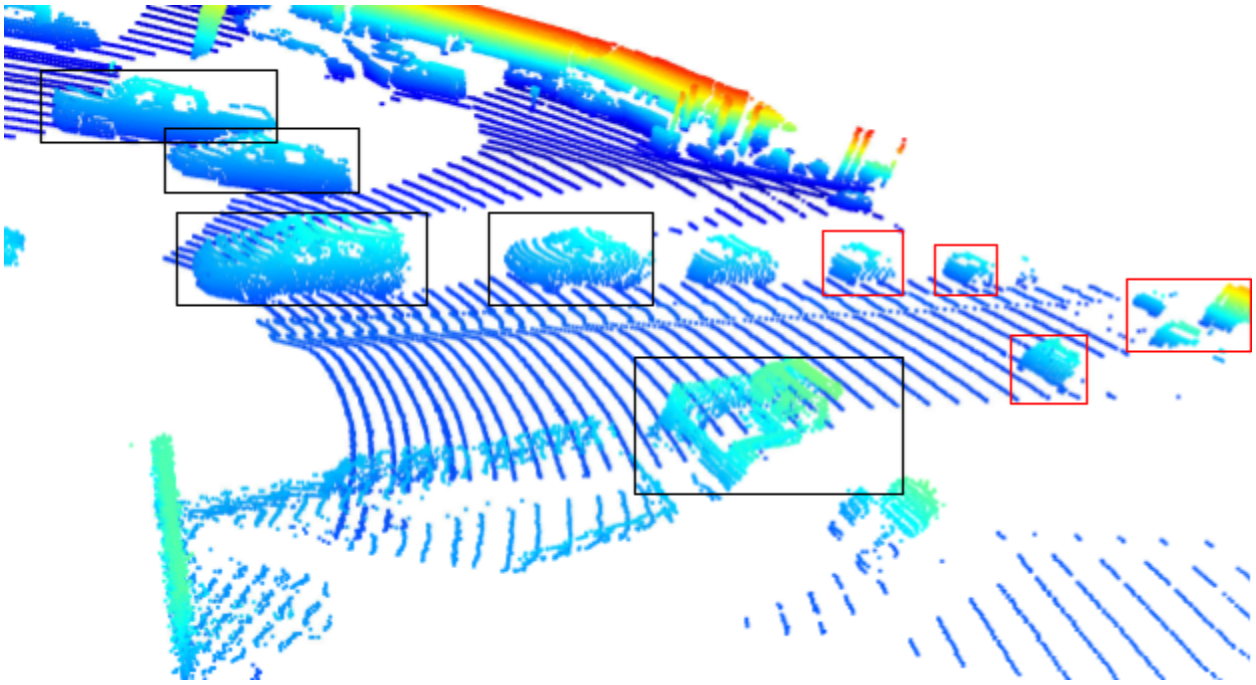

Figure 5: Vehicle identification based on their distance from the ego-vehicle

In figure 5, the black boxes represent close vehicles and the red boxes represent vehicles that are far away. The large number of 3d points for the nearer vehicles makes it easier for visualization whereas the number of 3d points for vehicles far away is a lot less compared to the close vehicles.

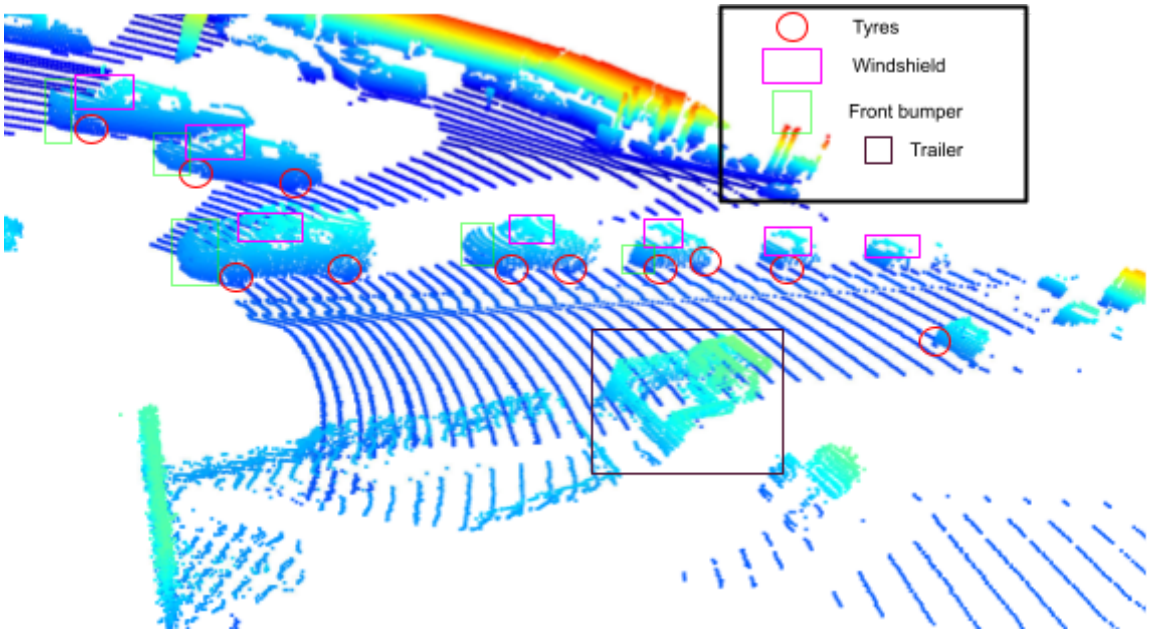

Figure 6: Specific vehicle features shown

Figure 6 shows the illustration of four specific vehicle pictures (tyres, windshield, front bumper, and trailer). As discussed in the previous section, the availability of dense 3d point clouds for closer vehicles makes feature identification easier. For vehicles that are too far away, we cannot identify specific features as there are not enough 3d points.