

# Requirements Document

## Team Name: Teaching AutoPilot to Dodge

Basil Al Zamil (alzamilb)

Tanner Fry (fryta)

Xilun (Jacky) Guo (guox)

### **Abstract:**

The primary goal of the project is to collect a dataset of real-world driving scenarios (images, video, and sensor data) where potentially problematic objects are in a frame along with bad weather and lighting scenarios. For example wildlife such as deer, cows, and birds need to be correctly identified, along with landmarks of odd shapes such as sculptures in all sorts of lighting and weather conditions. Then we will test whether current self-driving car software can detect, recognize, and accurately maneuver around unexpected and or unordinary objects. Specifically, we look at autonomous driving algorithms capability to comprehend objects given particular world conditions (such as lighting, rain, water, snow, etc).

**Requirements:**

Our main requirements are limited by the bugs we find. The hard goal we have is to test the algorithms used by CityScape in autonomous vehicles. Assuming there are issues with the image recognition algorithms under certain conditions, we must then collect the errors we find into a single dataset that the system fails with. This can be set as a baseline of failure and be forwarded to the CityScape team. This will also open us up to the possibility of modifying the algorithms used ourselves to try and fix the errors that we found.

Hard requirement(s): Create video and image datasets and apply them to the CityScape algorithms for testing.

Soft requirements(s): Create video and image datasets that find or expose faults in the image recognition software. Work on and try to improve the image recognition algorithms being used to try and correct the object or lighting errors we find.

**Planned Testing Methods:**

Since different weather conditions are a prime part of our testing objectives a dataset from different weather conditions must be collected. Thinking globally, there are many different climates in different places. In order to perfectly keep as much as conditions under control, we are required to clearly understand which kinds of weather could deviate the normal status. Heavy rain, snow (if it ever snows), sunny day, darkness, and direct sunlight and vehicle headlight into the camera all must be tested. Also we will focus primarily on country or side roads rather than inside city limits as most datasets have been primarily tested in busier settings. We will attach a decent quality camera (more than likely a Logitech webcam) to the inside of the car dashboard to collect video while driving. If possible we would also collect GPS data.