AutoDrive Project Weekly Report - November 30th

1. Fails of the week

- Proof-of-concept demo went off the track

2. Successes of the week

- Proof-of-concept demo showed promise and generally proved the concept

3. Difficulties this week

- Decided not to use human subjects for vertical acceleration experiment and to wrap up findings based on measurements and interpretation based on background research. Intending to cause a measurable amount of "physical and psychological discomfort", while in reality rather innocuous, sounds irresponsible and would be a no-go by any IRB.
- Human factors research in isolation is going well, but there are some concerns about being able to implement findings on our prototype in the second semester. There are some hardware limitations that restrict what can be translated from real-world behavioral requirements to the miniature car — for example, the car can only move at a constant speed and has no brakes, making implementation of acceleration bounds either impossible or trivial.
- Difficult to construct a reasonable track that can accomodate the latency in the time between the car's decision to actuation.
- Difficult to evaluate model's steering decision without a reference to the live footage from the camera on the prototype
- Speed of the vehicle is not held constant throughout the demo. The increasing velocity further amplify the latency response of the prototype during the demo.
- There could be a gap between the simulation environment and the deployment environment where we may need to assemble a separate training set to bridge the learning from simulation to the deployment environment.

4. Goals for next week

- Keep at the background research in anticipation of the second semester.
- Research ways to compile the car's steering decision with the context of what the car is seeing onto a live video footage
- Find ways to optimize software performance and improve frame rates per second
- Research ways to control the velocity of the prototype.
- Plan out ways to collect a separate data set for bridging the simulation and deployment environment.