ECE Capstone program
Spring 2017
Summary Project Info

1. Project number: 18

2. Project title (as will appear on the poster): Autonomous Vehicular Traffic Control (OnTRAC)

3. Team members: Raghav Bhardwaj, Nicholas Miele, Daniel Revie, Poornima Suresh, Kevin Zheng

4. Advisor(s) name(s): Professor W. Bajwa

5. Up to 10 keywords that will help to classify the project: self-driving, transportation, traffic, intersection, network, connected devices, collision avoidance, environmentally friendly, smart cars

6. Project abstract (up to 200 words) to be shared with judges:

Despite many advances in automotive engineering, several antiquated features of traffic flow control still dominate the vast majority of roads and highways. Stop signs and traffic lights require drivers to bring their vehicles to a complete stop before they resume driving. When the vehicle at the intersection begins to move again, drivers behind react with a delay which propagates throughout the line of cars. This, coupled with outdated infrastructure that has been in place for decades, are primary causes of traffic congestion. Our method for addressing traffic congestion is to remove the root of the problem: eliminate the need to completely stop at an intersection and drastically reduce the delay propagated through the line of vehicles. This solution is designed to work in parallel with the advent of self-driving vehicles. Using sensors that would be present on autonomous vehicles already, our system would have the approaching vehicles communicate and produce a local map of the intersection with relative distances from each other. This information can then be used to generate a procedure for passing through the intersection by adjusting the speeds of the vehicles. The goal would be to minimize the speed changes necessary to weave the streams of traffic between each other. Our project entails the development of the algorithm, a software simulation, and finally a scaled test using physical hardware with retrofitted RC cars.