**Ultrasound Disruptor –**

**Vehicle Crasher**

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**Abstract**

Not necessary for our proposal.

**Introduction**

During this project, we plan to create a basic disruptor that will confuse the ultrasound sensors built into each of the autonomous cars. Our purpose is to demonstrate the risk of cyber threats to autonomy, as a way of encouraging car companies to incorporate more security into their autonomous vehicles.

**Budget**

We are requesting $374 from the XV fund. We will be utilizing $300 for the purchase of a high tech laser (http://hightechlasers.R.us) that is completely unrelated to our project, and shipping for this laser is $70. Additionally, we will be requiring assorted wires made of dreams, which can be purchased at <http://dreamwire.co>. These wires cost an additional $4, with free shipping.

We have investigated the companies from which we are purchasing our materials, and have determined that .R.us is an unreliable domain, and that hightechlasers seems to be an unreliable company. As such, we hope you will fund that purchase. Dreamwire seems to be very reliable, although the product of theirs we are purchasing is not what they are best known for.

**Detailed Plan**

We will be using destructive interference to destroy the sound waves travelling between the ultrasonic sensor and the object they are sensing. We foresee some difficulties when the victim nears an object, as the waves will have less time in which we can intercept them. We will be using <http://soundwavetutorials.google> extensively, as they contain the knowledge necessary for doomsday.

We will need to use many skills that we have learned in this class for this. First, we will be using a speaker to cause the disruptions. A diagram of how this will be accomplished is below:

X x x x x x x

X x x x x x x x xx x BOOOOOM!!!!!!!!!!! Car -> EEEEKKK. CRASH.

So, as the diagram illustrates, the speaker will be used to cause the destructive interference, destroying the effectiveness of the ultrasound sensors.

We foresee learning a lot about how sound waves interact with each other and the surrounding environment.

We will be using our time as follows:

**Week 5**: During this week we will order the… and… While waiting for these to come in, we will begin detailed research into destructive interference. Patricia will be responsible for researching practical applications of destructive interference, Mr. Preacher will be responsible for creating sample labs that demonstrate destructive interference, and Lucas will be responsible for beginning construction of the prototype of the speaker system.

**Week 6**: We will continue research into sound waves. By this time we should have our really cool laser, so we’ll take turns using it to create really cool shapes on the wall.

Additionally, this week will be used to conclude construction of the base car. Our prototype sound destructor will be completed this week as well.

**Week 7**: This week will be split into two primary parts. The first part is a test of our prototype, which we anticipate will be working as intended at this point. The second part is a test of our speaker system, which we will use to disrupt our own prototype.

**Week 8**: ….

Etc.

**Conclusion**

We believe that, given enough resources (such as time), we would be able to create a super speaker. The purpose of this speaker would be to cancel all sound waves in the vicinity, which would result in the cessation of the effectiveness of ultrasound.

Given enough time, we believe we could develop a counterattack which would utilize destructive interference to stop the interfering sound wave from reaching the ultrasound sensor. Additionally, we believe that it would be possible to utilize variations in the sound emitted from the ultrasound sensor to negate the effectiveness of this attack.