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STS 4600

Socio-technical Synthesis:

Vehicle Detection System for Bicycles and the Ford/Firestone Recalls

My STS research and technical capstone project are linked through the idea that vehicles should be made to be safe for consumers. The two projects are both concerned with identifying areas in which to understand vehicle safety. However, the STS research and technical project are different in the types of vehicles they address and the specific mechanisms of safety. My technical team worked to create a device to enhance the bicycle safety and reduce deadly car and bike collisions. My STS research focuses on the ethical implications of vehicle design in the case of the Ford and Firestone recalls. My technical project and STS research project deal with different types of collisions and mechanisms for safety, both are related to customer vehicle safety.

In my technical project, my team was concerned with creating a product that could improve safety for bicyclists. My capstone group worked to create *The Sentinel*, a solar powered device that can be mounted on the back of a bike and connected to LED indicators visible to rider. The device detects vehicles approaching from behind using a sensor and alerts the rider with intuitive LED signals. The LED signals indicated both distance and speed with modulation of signal frequency. Our team created a working prototype of *The Sentinel*. The prototype was water proof, solar powered, and able to be powered for about 5 hours. The goal of the prototype was to enhance safety for riders and contribute to collision detection systems for bicyclists.

My STS research explores vehicle safety from the angle of failed vehicle safety. My research specifically focuses on the case study of the Ford and Firestone recalls of their Ford Explorer models in the late 90's and early 2000's. I explore how Ford and Firestone in both the design of the vehicle and the later recall acted unethically through the lens of virtuous engineering practice. This unethical behavior led to dangerous accidents and a lack of vehicle safety for the customer. My paper explores how virtue ethics can be used to analyze these actions and why they would be considered unethical. The goal of my STS research was to offer an analysis through an ethical framework for engineering students to understand the engineering choices that were made.

Simultaneously working on these two projects was extremely valuable. My technical project provided me with real experience creating a device that directly impacts safety of consumers. Additionally, it gave me an understanding of the types of design choices that frequently occur in this process, which gave me an understanding of the technical design process which underlies my STS research paper. Likewise, the research I was conducting about the unethical choices of Ford and Firestone strengthened my commitment to ethical engineering practices. Overall working on both the STS project and the technical project at the same time has aided me in understanding the complexities of designing for vehicle safety and striving towards ethical engineering design practices.