Thesis Project Portfolio

Solar Car Telemetry System

(Technical Report)

Analyzing Racial and Gender Biases Perpetuated by Autonomous Vehicles From a Data Feminism Standpoint

(STS Research Paper)

An Undergraduate Thesis

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Sociotechnical Synthesis

Recent technological advancements have pushed us further into adopting digital automation in our daily lives. One well known pioneering invention is the autonomous vehicle, which has gradually shifted driving responsibility to a complex decision making algorithm. This shift introduces a number of ethical concerns which I believe must be addressed before more widespread integration of such systems are advanced.

The STS thesis will expose one such area of weakness autonomous vehicle algorithms are prone to. Autonomous vehicles can adopt biases in decision making algorithms when they are trained upon data that is historically or representationally biased. I will be using the principles of Data Feminism as introduced by Catherine D'Ignazio and Lauren Klein to examine this issue and propose ways in which it can be addressed.

I believe that particularly in an application where human life is placed under great risk, we cannot shift said responsibility away from the user until we are confident the system is indeed faultless enough such that drivers need not worry about serious consequences. This is part of the reason why my team has initiated the development of a solar car telemetry system for the Solar Car Team at UVA. This solar car telemetry system is a web application that receives and displays data that is collected from the solar car in real time. It displays a variety of data points concerning the safety of operation as well as the performance of the vehicle's various components.

Overall, I am satisfied with the work I have conducted in both technical and STS portions of this Capstone project. Development of the first iteration of the solar car telemetry system has since been completed. I am hopeful that my STS research may inspire more developers to look at the design of these autonomous vehicle algorithm through a data feministic lens, as well as encourage more action towards defiling the deeply rooted power structures in the industry that can foster many dangerous biases in autonomous vehicle systems.