Thesis Portfolio

The Smithinator: Recumbent Vehicle Design and Entry for the 2020 ASME Human-Powered Vehicle Challenge
(Technical Paper)

Social Factors Influencing the Societal Adoption of Bicycles
(STS Paper)

An Undergraduate Thesis

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Table of Contents

Sociotechnical Synthesis

Bicycling is well known as a means of transportation, exercise, and leisure. Wide acceptance of bicycling could revolutionize the transportation sector, decreasing dependency on non-renewable resources, such as oil, and promote public health and overall wellbeing. With various bicycle models available, such as the upright and recumbent among others, this paper addresses the public's reception of biking design decisions.

The technical focus of this project aims to incorporate consumer ideas and preferences directly into the design of a recumbent bicycle to appeal to the average rider. The recumbent bicycle model was selected to succeed in speed challenges while promoting stability and safety. Analysis of the bike's frame, fairing, drivetrain, and steering systems is included to demonstrate the effectiveness of the design. The design of a recumbent bicycle brings up an important theme of popularity. While nearly everyone has ridden an upright bike at one point in their life, many people have never heard of a recumbent bicycle. For this reason, the STS research project aims to investigate the social factors that affect how bikes are adopted into society. Areas such as public stigma and language use, media attention, and available public infrastructure are discussed to identify how social factors influence the adoption of bicycles.

Understanding the social factors that impact the adoption of bicycles, in particular, is important because it allows policymakers and other officials to make informed decisions about the most effective and meaningful methods of promoting cycling. Viewing these patterns as a case study will provide a better understanding of how technologies are perceived and promote more socially apt technologies.