

The Sociotechnical Implications of Machine Learning for eCommerce and Transportation

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by

Daniel Boachie

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On my honor as a University student, I have neither given nor received unauthorized aid on this assignment as defined by the Honor Guidelines for Thesis-Related Assignments.

Daniel Boachie

Technical or Capstone advisor: Briana B. Morrison, Department of Computer Science

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Daniel Boachie
Computer Science
The University of Virginia
School of Engineering and Applied Science
Charlottesville, Virginia USA
dkb4aw@virginia.edu

ABSTRACT

Recent developments in Machine Learning (ML) and Artificial Intelligence (AI) offer new possibilities in automation that may transform e-commerce and transportation. Nevertheless, many Americans perceive AI products as dangerous and distrust the promised benefits of AI-powered vehicles. To solve the problem, the writer plans to research, read, and extract information from credible media sources and articles to highlight the reasons for the lack of trust in ML, its inherent danger, and the transformation it seeks to bring to e-commerce and transportation. The proposal explores how tech companies use promises about ML, 5G, and other state-of-the-art technology to revive the optimism for autonomous vehicles. In the anticipated results, the research will, among other things, help tech companies to streamline their production schedule, improve their apps, and ensure their apps and AVs are ready for e-commerce. It will also provide a new meaning for how a driver is defined, highlight the ethical use of consumer data, and lay the foundation for policy-making to integrate AVs into Americans' traditional modes of transportation and e-commerce.

1. INTRODUCTION

As interest develops in electric vehicles with apprehension, NPR recently reported: "Tesla recalls 362,758 vehicles over self-

driving safety fears" (NPR, 2023). Vehicle recall does not help build public confidence in the budding electric vehicle industry working ceaselessly to encourage users to embrace EVs. According to CNN (2022): "Electric vehicles accounted for 5.6% of all new vehicles in 2021, compared to...1.4% in 2019" (Valdes-Dapena, 2022). The world has witnessed a sudden increase in EV demand in the last few years. The exponential growth in EVs powered by AI and the economic prospects of machine learning is encouraging but not without distrust, warnings, and potential dangers for humans. In an address to attendees at the World Government Summit in Dubai about the dangers of ML, Elon Musk, a Tesla Space-X CEO and co-founder of ChatGPT, explicitly said: "One of the biggest risks to the future of civilization is AI..." Musk softened his blunt assessment of AI and added, "It's both positive or negative and has great promise, great capability.... But...with that comes great danger" (Browne, 2023). The potential danger and distrust for AI-powered products and vehicles dent electric cars' promised benefits if concrete solutions are not found to rectify EV problems.

2. RELATED WORKS

Last year, Partners for Automated Vehicle Education (PAVE), a diverse coalition of industries and nonprofits that

support the development of practical AVs and build public support for and confidence in them, echoed the distrust Americans have for AVs. PAVE states: “Sixty percent of Americans would trust AVs more if they better understood how the technology works” (PAVE, 2020). Thus, despite the promising benefits of ML, the technology is fraught with distrust, uncertainty, problems, and apprehensions that must be adequately researched, analyzed, and solved to ensure that humans tap the full potential of ML to advance e-commerce and transportation.

In another development, NPR reports that “Tesla recalls 362,758 vehicles over self-driving safety fears” (NPR, 2023). This article relates to the report, drums users’ fears, and explains why consumers’ optimism has waned for autonomous vehicles. Again, Browne (2023) explains the problems of the Tesla recall in further detail and highlights Elon Musk’s warning that AI is one significant risk for the future of civilization (Browne, 2023). This central point relates to the writer’s report since Americans distrust the benefits of AVs that rely heavily on AI. Also, Valdes-Dapena article’s main point is “Electric vehicles accounted for 5.6% of all new vehicles in 2021, compared to...1.4% in 2019.” This article relates to the report since it further explains how consumers were initially encouraged to purchase AI-powered vehicles before they became skeptical.

3. PROPOSED DESIGN

To understand the proposed design, it is necessary to consider the system architecture and requirements.

3.1 Review of System Architecture

Identifying the sociological implication of ML and mitigating its downside will boost confidence in AI, and driverless vehicles, and unravel their economic potential for the nation.

3.2 Requirements

As a researcher, I will need a computer, social media accounts, Google Surveys, and professional networks such as LinkedIn to reach a broad audience, administer questionnaires, and gather data for analysis. I will also need an academic professor to guide the work and ensure I am on the right track. Additionally, having Microsoft Excel will be necessary to analyze data, and we will ultimately need access to an academic journal to publish my findings.

3.2.1 Client Needs

Consumers need reliable and affordable transportation to execute their business daily, and they want functional and safe apps to drive their autonomous vehicles.

3.2.2 System Limitations

One of the limitations I face is time constraints. The number of people that can be reached through social media within the short time at my disposal is unknown. Having a first-hand account from the engineers would be helpful, though engineers often withhold information to protect internal manufacturing secrets. Again, machine learning and autonomous vehicles are novel ideas requiring more time to be popularized and adequately researched.

3.3 Key Components

The critical components of the research project are specifications, challenges, and solutions.

3.3.1 Specifications

The resources used for the project should have excellent functionality, performance, aesthetics, and cost-effectiveness for the project to be successful. Questionnaires through social media and Google surveys should be user-friendly and performed reliably. The Microsoft Excel

data result charts need to be organized and visually appealing.

The target audience for this research is the engineering community, including faculty and students. Therefore, I will use a minimum sample of 385 respondents and may administer 400 surveys to accommodate incorrect responses.

3.3.2. Challenges

There are challenges in data collection and time brevity for the project. Getting respondents to complete a research survey in a fast-paced culture is an uphill task. In addition, the research must be conducted within the duration of the course term.

3.3.3. Solutions

I will administer concise survey questions to overcome the data collection challenge and reduce the scope of the research to a level that can be conducted within the allotted time.

4. ANTICIPATED RESULTS

Researching the social-technical implication of machine learning and e-commerce will produce numerous results. First, since many automated vehicles are driverless, the research will create a new understanding of the term “driver.” For instance, one may ask, “Who is the driver of a driverless car?” Is the driver the car’s user or the AI algorithm that steers the vehicle?

Second, using AVs to promote e-commerce will enable engineers to learn new vehicle behavior to improve safety. Also, since engineers hype autonomous cars’ production dates and apps, the research result will help tech companies to streamline their production schedule, improve their apps, and ensure their apps and AVs are ready for e-commerce. Additionally, a well-developed AV will reduce carbon footprint

and improve the environment exponentially since AVs do not use crude oil.

Third, the research will highlight the ethical use of consumers’ data. Using AVs means consumers must provide personal information, including their residence, bank account, workplaces, and even where their children attend school. In addition, AVs may gather information on how users operate AVs. For instance, it may record whether a user wears a car seat belt or drives over the speed limit. This vital information may be commercialized to the detriment of the user. Hence, the research may help find ethical ways to use and protect consumer data. Finally, since the automated industry is a new frontier, it will require new laws to integrate AVs into Americans’ traditional modes of transportation and e-commerce.

5. CONCLUSION

Like all new inventions, electric vehicles, machine learning, and artificial intelligence promise to transform transportation, e-commerce, and the United States economy. Nevertheless, advocates and engineers of electric vehicles must first overcome the distrust and negative perceptions potential users have about electric vehicles. Thus, tech companies must streamline their production schedule, improve their apps, and ensure their apps and AVs are ready for e-commerce. These steps will encourage Americans to embrace AI, machine learning, and electric vehicles confidently.

6. FUTURE WORK

One concept that has emerged in this work is a new understanding of the term “Driver.” Future research can focus on how the concept evolves and integrates into America’s existing transportation laws. Similarly, researching the ethical use of users’ data and how users confidently

embrace electric vehicles over time will be a step in the right direction.

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