

An Analysis of Geometric and Machine Learning Approaches to Speaker Diarization

The Real Value of Work in an Increasingly Artificial World

A Thesis Prospectus
In STS 4500
Presented to
The Faculty of the
School of Engineering and Applied Science
University of Virginia
In Partial Fulfillment of the Requirements for the Degree
Bachelor of Science in Systems Engineering

By
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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.

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Public Interaction with AI

**Navigating Government Interaction and Public Perception of Artificial Intelligence
Development**

STS 4500 Prospectus
Systems Information Engineering
Bachelor of Science in Systems Engineering
The University of Virginia, Charlottesville

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Navigating Government Interaction and Public Perception of Artificial Intelligence Development

Overview:

Last summer, I worked at a management consulting firm that used Robotic Process Automation (RPA) to decrease the repetitive manual work across an insurance brokerage. I saw the effect artificial intelligence can have on a large scale, saving hours of daily repetitive work for employees. As someone who has experienced the benefits of RPA firsthand, I would say that AI can improve business efficiency and reduce human error. However, it is also important to consider the potential ethical and societal implications of automation and acknowledge the concerns raised by those who fear its impact on job loss and privacy. While AI may offer solutions to streamline processes, we must approach its implementation with caution and ensure that it is used ethically and responsibly to mitigate any potential negative consequences.

Problematization:

Public perception of AI is evolving. Machine Learning and Automation are taking their spot on the world stage as countries race to optimize military logistics and weapons systems to provide a strategic upper hand. AI is increasingly being used for strategic defense purposes by countries including applications of military drones, autonomous weapons systems, and cyber defense. ("Artificial intelligence: The future of war?") By leveraging AI, countries can improve their defense capabilities and respond more quickly and effectively to potential threats. Automation of labor is another area where AI causes concern among the public. According to a study by the Pew Research Center, 72% of Americans are worried about a future where robots and computers can do many human jobs (Anderson and Perrin). The fear is that AI will replace human workers, leading to unemployment and economic inequality. AI is also raising concerns about privacy invasion and surveillance. The increasing use of facial recognition technology, for example, has been criticized for its potential to violate civil liberties. In a report from the American Civil Liberties Union, researchers found that Amazon's facial recognition technology incorrectly matched 28 members of Congress with criminal mugshots ("Amazon's Face Recognition Falsely Matched 28 Members of Congress With Mugshots"). Understandably, many Americans fear such technology could be used to track individuals without their knowledge or consent.

Guiding Question or Main Argument:

The United States should encourage the research and development of Artificial Intelligence Technology, while mitigating the harm it may induce on our society.

Projected Outcomes:

The research aims to explore the potential benefits and challenges of AI implementation in the workplace while recognizing the potential biases and inequalities that may arise. This analysis will challenge the dominant narrative that AI is an inherently negative technological advancement and instead consider the social and ethical benefits of its use. The outcomes of this research will suggest ways in which organizations can responsibly implement AI to help both workers and the company, as well as empower a community of workers and researchers to critically engage with the impacts of emerging technologies. The potential beneficiaries of this research are workers, organizations, and society at large.

Technical Project Description:

I have been working to help develop a machine learning algorithm to analyze audio-text data in a start-up. It will record the interaction between an employee and a customer and provide a dashboard of analytics based on the data gathered in the exchange. Data privacy, automation, and artificial intelligence are constantly being discussed to make the best product for our customers.

Preliminary Literature Review & Findings:

My annotated bibliography covers a range of topics related to artificial intelligence (AI) and its sociological effects. According to Anderson et al. (2012), the impact of digital technology on journalism highlights the need for ethical and social considerations in AI's use. Brynjolfsson and McAfee (2017) examine the economic implications of AI on businesses, while Bughin et al. (2018) focus on the potential applications and economic value of deep learning. Deffuant et al. (2018) survey the literature on opinion dynamics and the impact of big data on them, while Diakopoulos (2019) looks at the impact of personalization algorithms on political communication. Egelman et al. (2016) analyze the prevalence of mobile apps that use microphones to listen to users without their knowledge or consent. Floridi (2019) discusses the ethical implications of AI and automation and the need for a new ethical framework. Froomkin (2018) discusses the potential privacy concerns arising from the use of domestic drones and the need for regulatory frameworks. Hajian and Domingo-Ferrer (2013) argue for a methodology for preventing discrimination in data mining, while Hartzog (2016) suggests a more comprehensive approach to standing to address privacy violations. Finally, Kshetri (2018) explores the role of blockchain in meeting key supply chain management objectives.

These sources provide valuable insights into the sociological implications of AI and related technologies in different contexts, highlighting the need for ethical considerations, transparency, accountability, and legal and regulatory frameworks to address privacy concerns and prevent discrimination. (Anderson et al.; Brynjolfsson and McAfee; Bughin et al.; Deffuant et al.; Diakopoulos; Egelman et al.; Floridi; Froomkin; Hajian and Domingo-Ferrer; Hartzog; Kshetri) Future research can build on these approaches to develop a better understanding of the broader societal implications of AI and to explore ways to address the challenges and problems identified in these studies.

STS Project Proposal:

Science and Technology Studies (STS) is an interdisciplinary field that explores the relationship between science, technology, and society. STS scholars investigate how scientific knowledge and technological developments shape and are shaped by social, cultural, political, and economic factors. In this context, my project can be considered an STS project because it examines the societal impact of artificial intelligence (AI) research and development. Specifically, it questions the role of government regulations in shaping the pace and direction of AI innovation and argues for a more permissive approach that encourages innovation and fosters the public acceptance of AI products.

My project adopts a techno-optimist perspective that emphasizes the potential benefits of AI technology for society, while acknowledging the risks and challenges associated with its development and deployment. To investigate my topic, I will draw on the "affordance theory" and "value sensitive design" frameworks in STS. Affordance theory focuses on the properties of technology that enable or constrain user behavior, while value sensitive design emphasizes the importance of incorporating ethical values into the design and development of technology. These frameworks will help me analyze the ethical and social implications of AI technology and develop guidelines for responsible AI innovation.

To accomplish my research goals, I plan to conduct a literature review and analysis of the existing scholarship on AI regulation and governance. I will also analyze policy documents and position papers from government agencies, industry groups, and advocacy organizations to understand the current debates and trends in AI policy. Additionally, I plan to conduct interviews with experts in the field, including academics, policymakers, and industry leaders, to gain insights into their perspectives on AI regulation and the role of government in promoting AI innovation.

Barriers & Boons

As the author of this paper, I recognize that there are potential blind spots and limitations that may impact the credibility and validity of my arguments. One limitation is my lack of expertise in the technical aspects of AI development, which may hinder my ability to fully understand and analyze the nuances of the field. On the other hand, there is a major conflict of interests with working at a AI tech start-up. Additionally, my personal biases and positionality as a student may influence my perspectives on the role of government regulation in AI development.

Financial and time constraints may also limit the scope and depth of my research, as well as my ability to access certain resources and experts in the field. Communication barriers, such as language and cultural differences, may also impede my ability to fully understand the perspectives of those involved in AI development.

To address these limitations, I plan to conduct extensive literature reviews and seek out diverse perspectives from experts in the field. I will also strive to remain cognizant of my personal biases and positionality and incorporate diverse viewpoints into my analysis.

Additionally, I will consider alternative research methods, such as conducting interviews and reading both academic and public media to supplement my literature review and gain a more comprehensive understanding of the topic.

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ChatGPT was used for the research of the Prospectus.