Thesis Project Portfolio

Evaluating the Importance of Demographic and Technical Factors in Creating Authentic-Sounding AI-Generated Human Voice Clones

(Technical Report)

Ethical Implications of the Deepfake of President Zelensky in Russia-Ukraine War using the Utilitarian Moral Balance Sheet

(STS Research Paper)

An Undergraduate Thesis

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In Fulfillment of the Requirements for the Degree

Bachelor of Science, School of Engineering

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Sociotechnical Synthesis

The relationship between my technical capstone project and STS research paper is rooted in the exploration of Artificial Intelligence (AI) deepfake technology. While my capstone project investigates factors that contribute to the authenticity of AI-generated voice clones, my STS research paper examines the ethical implications of deepfake technology in the context of modern warfare and social media. Both projects address the broader theme of trust and authenticity in digital communications, highlighting the critical need for reliable and ethical AI applications.

In my technical capstone report, my team and I investigated the factors that make AI-generated voice clones sound authentic, from the perspectives of both humans and machines. By creating a comprehensive voice library of 350 samples and selecting a subset for an online survey, we aimed to understand how demographic and technical factors influence human perception of voice authenticity. The findings revealed that certain cloned voices were indistinguishable from authentic ones, highlighting the potential risks associated with voice cloning technology. In addition, the discrepancy between human and machine evaluations of voice authenticity suggests that current models may not fully capture the nuances of human perception, indicating a need for further refinement in AI evaluation tools.

My STS research paper focuses on the ethical implications of the deepfake video of Ukrainian President Volodymyr Zelensky during the Russian-Ukraine War, which falsely depicted him urging soldiers to surrender. Utilizing utilitarian ethics and Bentham's moral balance sheet, I argue that the deepfake incident is immoral due to its negative consequences on societal trust and the integrity of information. The analysis emphasizes the significant impact of

deepfake technology on public opinion and the ethical violations involved in manipulating information during conflicts. This case study serves as a poignant example of the broader ethical challenges posed by AI technologies in high-stakes environments.

Working on both projects simultaneously has provided valuable insights into the intersection of technology and ethics. The technical project highlighted the challenges in creating authentic voice clones, while the STS research focused on the ethical considerations of using such technology in real-world scenarios. These experiences have enhanced my ability to critically evaluate the ethical dimensions of AI voice cloning and deepfake technologies. Moreover, they have equipped me with the knowledge to protect myself and others from the dangers posed by AI, ensuring that my work is guided by a strong ethical framework. This dual focus on technical proficiency and ethical responsibility will be crucial as I continue to navigate the evolving landscape of AI and its applications.