VISVESVARAYA TECHNOLOGICAL UNIVERSITY

"JNANA SANGAMA", BELAGAVI - 590 018

A MINI PROJECT REPORT

on

"Detection of AI voice manipulation"

Submitted by

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In partial fulfillment of the requirements for the VII semester

NEURAL NETWORKS AND DEEP LEARNING LABORATORY

of

BACHELOR OF ENGINEERING

in

ARTIFICIAL INTELLIGENCE AND DATA SCIENCE

Under the Guidance of

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SAHYADRI

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An Autonomous Institution

MANGALURU

2023 - 24

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MANGALURU

COMPUTER SCIENCE AND ENGINEERING

(ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING)

CERTIFICATE

This is to certify that the **Mini Project** entitled **"Detection of AI voice manipulation"** has been carried out by **Rayson M Fernandes(4SF21AD043)** and **Shashank S K(4SF21AD048)**, the bonafide students of Sahyadri College of Engineering & Management in partial fulfillment of the requirements for the VII semester **Neural Networks and deep learning laboratory (21AIL75)** of **Bachelor of Engineering in Computer Science and Engineering(AI&ML)** of Visvesvaraya Technological University, Belagavi during the year 2024 - 25. It is certified that all corrections/suggestions indicated for Internal Assessment have been incorporated in the report deposited in the departmental library. The mini project report has been approved as it satisfies the academic requirements in respect of mini project work.

Dr. Gurusiddayya Hiremath	**Dr. Pushpalatha K**
Faculty coordinator	Professor & Head
Dept. of CSE(AI&ML), SCEM	Dept. of CSE(AI&ML), SCEM

External Practical Examination:

Examiner's Name	Signature with Date
1.	.....
2.	.....

SAHYADRI

College of Engineering & Management

An Autonomous Institution

MANGALURU

Department of Computer Science and Engineering

(Artificial Intelligence and Machine Learning)

DECLARATION

We hereby declare that the entire work embodied in this Mini Project Report titled **"Detection of AI voice manipulation"** has been carried out by us at Sahyadri College of Engineering and Management, Mangaluru under the supervision of **Dr. Gurusiddayya Hiremath** as the part of the VII semester **Neural Networks and Deep Learning Laboratory (21AIL75)** of **Bachelor of Engineering** in **Computer Science and Engineering(AI&ML)**. This report has not been submitted to this or any other University.

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Abstract

All the important aspects of modern-day society, including global politics, are influenced by AI-generated deep fakes, which nowadays are easier than ever to produce. Present-day politics is also characterized by the rise of illiberalism. The limitations of democratic practices, which occur at a global level, are well documented. However, there is a lack of research meant to classify types of deepfakes and the dangers they pose to democratic practices, such as elections. The goal of this paper is to create a framework in order to describe AI-generated deepfake use, especially in politics. In the long run, the purpose of this framework would be to help future research papers better describe cases in which deepfakes are being used in politics and their effects, especially how these practices are being employed by populist politicians in order to enhance their electoral message. This descriptive paper is based on the qualitative approach of document research, presenting several deepfake categories that can be used in future research in order to create a clear image of the way in which AI-generated deepfakes impact politics. The paper has generated interesting results. There are a multitude of types of deepfakes that originate from various sources. The only difference is the complexity of the technology being used. Another relevant discovery is that deepfakes can be used for multiple purposes, not only to undermine political opponents. Moreover, deepfakes could be used anytime, not just on the brink of elections. This paper is relevant for the study of the dangers deepfakes carry in both national and international politics. It represents a step forward in the research on the implications carried by the use of deepfakes in politics.

Acknowledgement

It is with great satisfaction and euphoria that we are submitting the Mini Project Report on **"Detection of AI voice manipulation"**. We have completed it as a part of the VII semester **Neural Networks and deep learning laboratory (21AIL75)** of **Bachelor of Engineering** in **Computer Science and Engineering(AI&ML)** of Visvesvaraya Technological University, Belagavi.

We are profoundly indebted to our guide, **Dr. Gurusiddayya Hiremath**, Assistant Professor, Department of Computer Science and Engineering(AI&ML) for innumerable acts of timely advice, encouragement and We sincerely express our gratitude.

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Chapter 1

Introduction

In the digital era, technology permeates all aspects of life, including politics. AI-generated deepfakes have emerged as powerful tools capable of undermining democratic practices. By manipulating video, audio, and text, these tools can create fabricated content that blurs the line between reality and fiction. This chapter introduces the scope of the study, emphasizing the urgency to understand the political implications of deepfakes.

Chapter 2

Literature Review

2.1 Artificial Intelligence: A Conceptual Framework

Artificial Intelligence (AI) refers to the simulation of human intelligence by machines. Its applications range from healthcare and transportation to national security. However, the same capabilities that make AI transformative can also make it dangerous. AI's ability to process large datasets and learn from them enables the creation of deepfakes, which can be weaponized in political campaigns.

2.2 Deepfake Technology

Deepfakes leverage deep learning algorithms to manipulate or generate digital content. Techniques such as face swaps, lip-syncing, and voice cloning can create convincing fake media. While these technologies have legitimate uses, such as in entertainment and art restoration, they also pose significant risks when used for malicious purposes, such as disinformation or blackmail.

Chapter 3

Classification of Deepfake Techniques

3.1 Face Swaps

This technique replaces a person's face in a video with that of another individual. It has been used to defame public figures and spread disinformation.

3.2 Lip Syncing and Voice Cloning

Lip-syncing aligns a person's lip movements with a fake audio track, creating the illusion of authenticity. Voice cloning further enhances this by replicating a person's voice, making it difficult to distinguish between real and fake speech.

3.3 Gesture Mimicking and Entire Body Deepfakes

These advanced techniques analyze and replicate a person's gestures and movements, enabling the creation of highly realistic fake videos.

3.4 Deepfake Text and Audio

Deepfake technology is not limited to visual media. Text and audio deepfakes can generate fake statements or conversations, often used in phishing or disinformation campaigns.

Chapter 4

Implications for Politics

4.1 Manipulation of Voter Perception

Deepfakes can alter voter perceptions by discrediting candidates or spreading false narratives. For example, fabricated videos or audio recordings can be used to misrepresent a candidate's views or actions.

4.2 Misinformation Campaigns

Political actors can use deepfakes to amplify misinformation, targeting opponents with fake content. Such campaigns erode public trust in political processes.

4.3 Public Awareness Stunts

While primarily seen as a threat, deepfake technology can also be used for positive purposes, such as raising awareness about its potential dangers. However, these efforts may inadvertently increase public distrust of genuine media.

Chapter 5

Regulatory Challenges and Future Directions

5.1 The Need for Legal Frameworks

Current regulatory measures are insufficient to address the ethical and societal challenges posed by deepfakes. Governments and organizations must collaborate to establish robust legal frameworks.

5.2 Technological Countermeasures

The development of AI tools to detect and counteract deepfakes is crucial. These tools must evolve alongside deepfake technologies to remain effective.

Chapter 6

Conclusion

Deepfake technology represents both an opportunity and a threat. While it has applications in entertainment, education, and art, its misuse in politics poses serious risks to democracy. This paper underscores the importance of continued research and regulation to mitigate these risks and ensure that AI technologies are used responsibly.

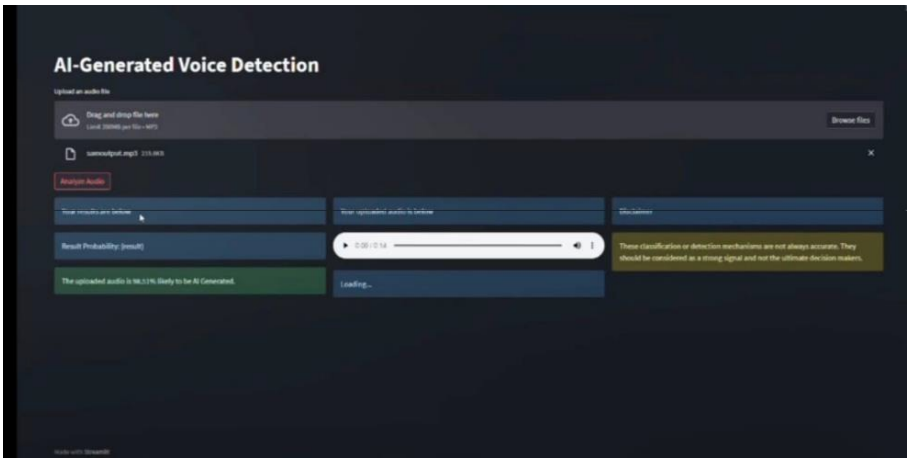

Figure 6.1: AI-Generated Voice Detection Interface

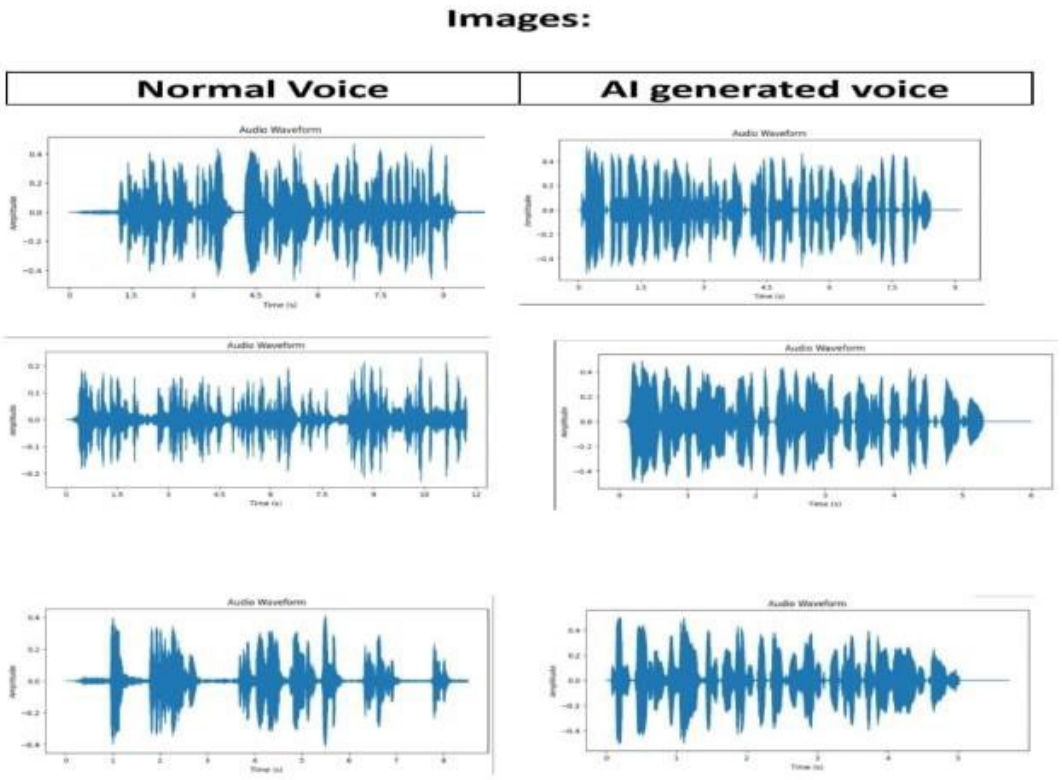

Figure 6.2: Comparison of Normal Voice and AI Generated Voice (Waveform)

References

1. Farid, H., & Schindler, H.-J. (2020). Deep Fakes - On the Threat of Deep Fakes to Democracy and Society.

2. Smith, H., & Mansted, K. (2020). What's a Deep Fake? Weaponised Deep Fakes: National Security and Democracy.

3. Manyika, J. (2022). Getting AI Right. Daedalus.

4. Stokel-Walker, C. (2023). Awareness of Deepfakes Can Make People More Suspicious about Real Videos. Fast Company.

5. van der Sloot, B., & Wagensveld, Y. (2022). Deepfakes: Regulatory Challenges for the Synthetic Society. Computer Law & Security Review.