Final Year Project Proposal

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Suggested Supervisor:

Faculty Member's Name: <u>Ms. Sara Rehmat</u>   Signature: _____

Date (10 February, 2023)

Project Details

Project Title	Deepfake Audio Detection
Project Area of Specialization	Machine Learning, Audio Processing, Computer Science, NLP
List Related Core Subjects	1) Information Security. 2) Artificial Intelligence. 3) Software Engineering.
List Related Elective Subjects	1) Machine Learning. 2) Natural Language Processing. 3)Audio Processing.

Project Start Date	2023-02-10	**Project End Date**	2023-12-31

| Project Summary (less than 2500 characters) | Deepfake audio detection is a project focused on developing a machine learning-based solution to identify and detect fake audio recordings generated using deep fake technology. The goal of this project is to develop a system that can accurately distinguish between real and fake audio recordings and provide a reliable measure of audio authenticity.

The project would typically involve the following steps:

1. **Data collection:** A large dataset of real and fake audio samples would be collected and annotated for use in training and testing the machine learning models. |
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	2. **Model training:** A machine learning model, such as a Convolutional Neural Network (CNN) or a Recurrent Neural Network (RNN), would be trained on the annotated audio data using supervised or unsupervised learning techniques. 3. **Model evaluation:** The trained model would be evaluated using various metrics, such as accuracy, precision, recall, and F1 score, to determine its performance on real-world deep fake audio data. 4. **Deployment:** The trained model would be integrated into a practical system for deep fake audio detection, such as a desktop application or a web-based platform.
Project Objectives (less than 2500 characters)	The goal of this project is to develop a system that can accurately distinguish between real and fake audio recordings and provide a reliable measure of audio authenticity.
Project Implementation Method (less than 2500 characters)	In this project, various deep-learning models will be employed. To gather the training data, we will first acquire a dataset of real audio and then create a fake audio dataset using deep learning algorithms such as Generative Adversarial Networks (GANs), WaveNet, or WaveFake. For analysis purposes, the objective is to achieve the highest accuracy possible and to this end, different deep learning algorithms will be evaluated to determine the most suitable approach.
Benefits of the Project (less than 2500 characters)	1. **Improved Security:** Deepfake audio can be used for malicious purposes, such as spreading false information, impersonating someone else's voice, or compromising sensitive information. By detecting deep fake audio, organizations, and individuals can protect themselves from these types of threats. 2. **Increased Trust in Audio Content:** The widespread use of deep fake audio has made it increasingly difficult to determine the authenticity of audio content. By developing deep fake audio detection techniques, people can have increased confidence in the audio content they encounter and make more informed decisions. 3. **Better Understanding of Machine Learning Models:** The process of detecting deep fake audio requires a deep

	understanding of machine learning algorithms and models, including deep neural networks and generative adversarial networks. By conducting a deep fake audio detection project, researchers and developers can gain valuable experience and insights into these complex models.
Technical Details of Final Deliverable (less than 2500 characters)	We will create a cross-platform application that will run on desktop as well as mobile. And it is easily useable by everyone.
Final Deliverable of the Project	We will create a cross-platform application for deep fake audio detection, capable of accepting audio input and providing an output indicating the authenticity of the audio whether it's 'Fake' or 'Real'.
Type of Industry	Law Enforcement.
Technologies	Python, Audio Processing, Machine Learning algorithms, Deep Learning Algorithm
Sustainable Development Goals	Promote peaceful and inclusive societies for sustainable development, provide access to justice for all, and build effective, accountable, and inclusive institutions at all levels.

Project Key Milestones

Elapsed time in (days or weeks or months or quarters) since the start of the project	Milestone	Deliverable
FYP 1	1st 6 Months	Acquire Real audio and transform them into Fake audio. Afterward, carry out pre-processing on the obtained data for further use.
FYP 2	2nd 6 Months	Our objective is to train a comprehensive deep fake audio detection model and develop a cross-platform application