TED UNIVERSITY
CMPE 491-O
Senior Project I

Detection of AI-Generated ECG Signals

Project Proposal

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Project web page

Overview

This project aims to address the possible vulnerabilities which may emerge from the artificial generation of ECG signal by the popular generative artificial intelligence models. Recent developments in bioinformatics show that ECG signals captured from the human heart can serve as a valuable biometric modality for identity recognition. Therefore, the genuineness of the ECG signal possesses great threat to platforms that may use ECG signal as the credentials to authenticate or authorize in the future.

Our solution involves the development of a machine learning model capable of distinguishing between authentic and AI-generated ECG biometric data with a satisfactory accuracy and precision, allowing platforms to confidently use it for securing applications.

Objectives

First of all, there aren't many artificially generated ECG signals we can use directly to train a machine learning model, so we need to find a generative artificial intelligence model that can be trained to produce the ECG signals we need. Using this model, we plan to train it with real ECG signals collected from various resources. Then, by combining both synthetic and genuine data, we will be able to train a new model capable of distinguishing real ECG signals from synthetic ones.

Objective	Brief Description of the Objective
Generate Synthetic data	Generate a synthetic data required to develop machine learning
Develop a machine learning model	Develop a machine learning model to accurately distinguish between genuine and synthetic ECG signals.
Test and improve the model	Ensure model performs with acceptable accuracy in real-world scenarios