



Rajasthan Police Cyber Crime Awareness Mission

Deepfake Detection



Problem Statement No.: 8

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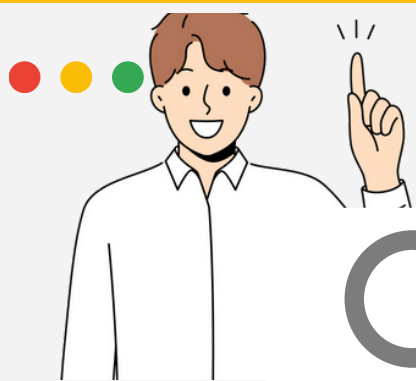
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Q Problem Statement



- Detecting morphed or manipulated video and audio created using deepfake.

Detecting
Various Deep
Fake Types

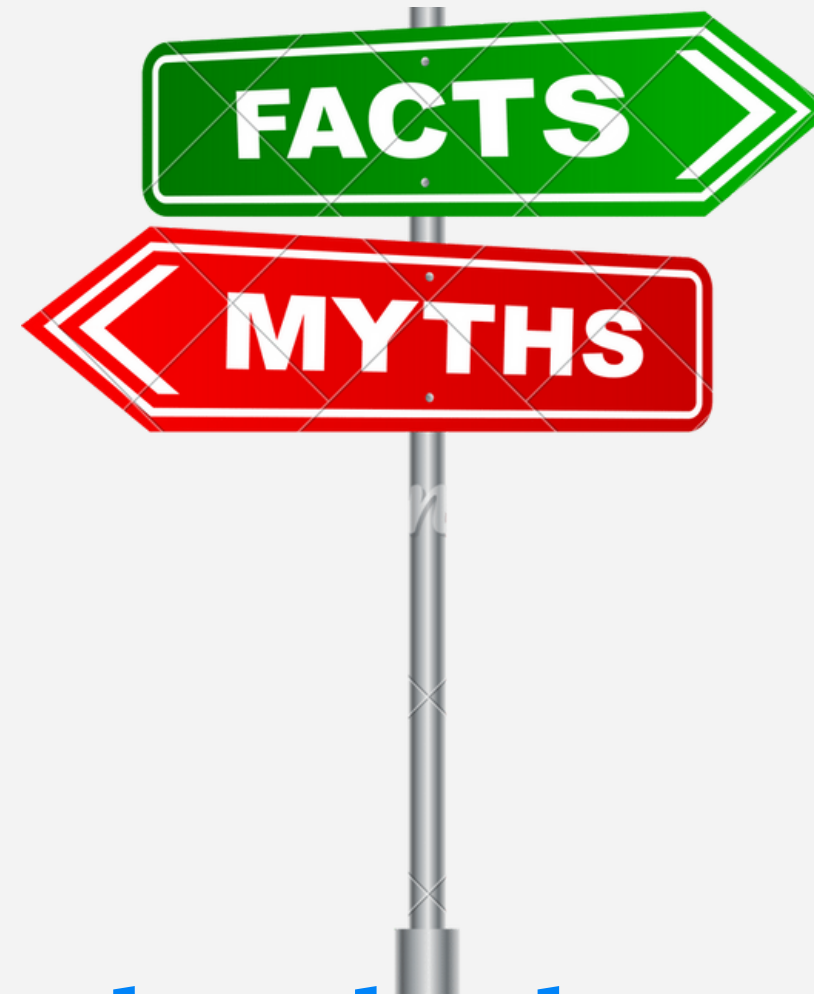
Real-time
Analysis

Multimodal
Detection

User-
friendly
Interface



Motivation



Do we ever check the authenticity of a video or audio clip circulated online?

Recent Deepfakes



TOI Times of India

Rashmika Mandanna DEEPFAKE video: Govt announces strict punishment of three years imprisonment and fine of Rs 1 lakh

Rashmika Mandanna's recent viral deepfake video has started a much-needed discussion about the misuse of technology.

8 Nov 2023



THE HANS INDIA · 1d

Now deepfake video of Sachin Tendulkar comes out promoting gaming app

Iconic cricketer Sachin Tendulkar has become the latest celebrity to fall victim to a deepfake video. On Monday ...



m Mint

'False': Ratan Tata calls out a 'deepfake' video of him giving investment advice | Mint

Veteran industrialist Ratan Tata has called out a deepfake video of him giving investment advice in an Instagram post.

1 month ago





Literature Survey

Year	Title	Author	Dataset	Technique followed	Accuracy	Abstract
2020	Unmasking DeepFakes with simple Features	Ricard Durall,Margre t Keuper, Franz-Josef Pfreundt, Janis Keuper	FaceFore ns-ics ++	SVM Logistics reg.	90% 81%	This study addresses the growing concern surrounding the proliferation of fake digital content, particularly AI-generated fake images, due to advancements in deep generative models.
2023	Deepfake audio detection and justification with explainable AI	Aditi Govindu, Preeti Kale, Aamir Hullur, Atharva Gurav, Parth Godse	MNIST	VGG16 CNN	93.37% 88.72%	This study explores deepfake audio, focusing on AI-generated synthetic audio's evolution and cybersecurity implications using GANs.

S/w H/w requirements



Output Device

Telegram

Python

System camera

Render

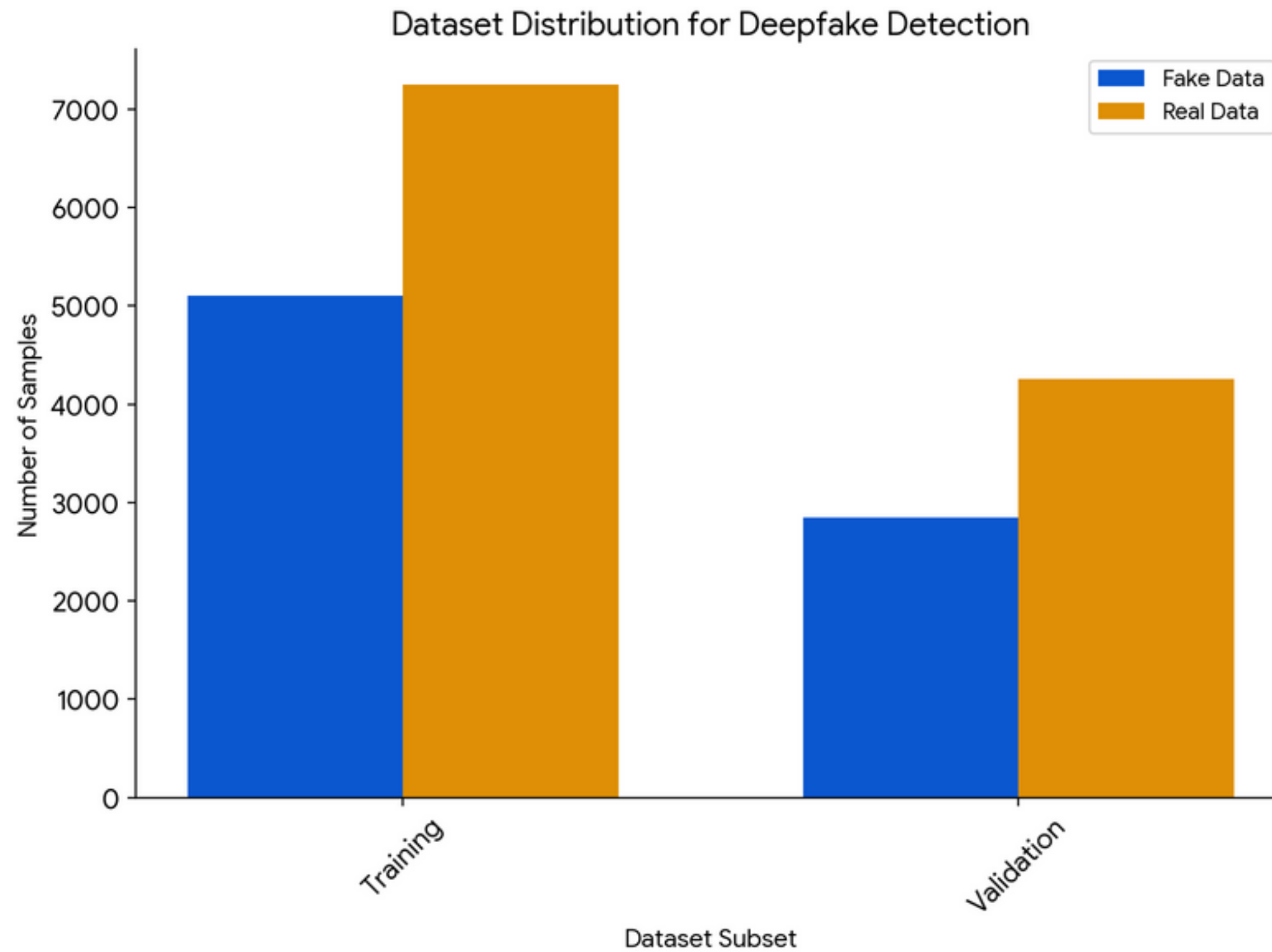
MesoNet

i3 Processor

Pycharm IDE

Tortoise

Dataset Collection



Module Architecture

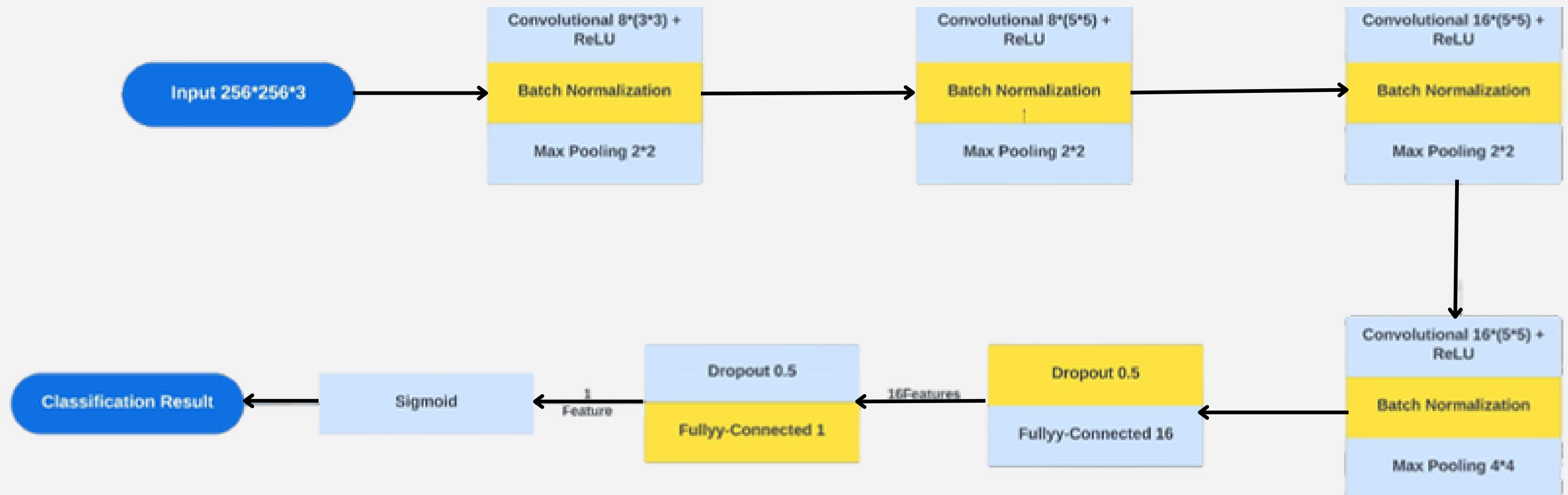


Fig1. Architecture Diagram

Video Detection module



Detecting fake video using mesonet through various validation layers.

1. Convocational Layer

Extracting spatial features from each frame within a video sequence

$$Output_{conv} = F\left(\sum_{i=1}^n (w_i * Input) + b\right)$$

Convocational matrix

2. Batch normalizational Layer

Normalize input at each layer and reduce interdependance between the parameter of given layer and input distribution of next layer.

Video Detection module



3. Max pooling Layer

To reduce region of pixel to that regions maximum value.

$$Output_{maxpool} = \max(Input)_{maxpool}$$

4. Dense layer

Captures global pattern and relationships within data.
It outputs score for each potential class.

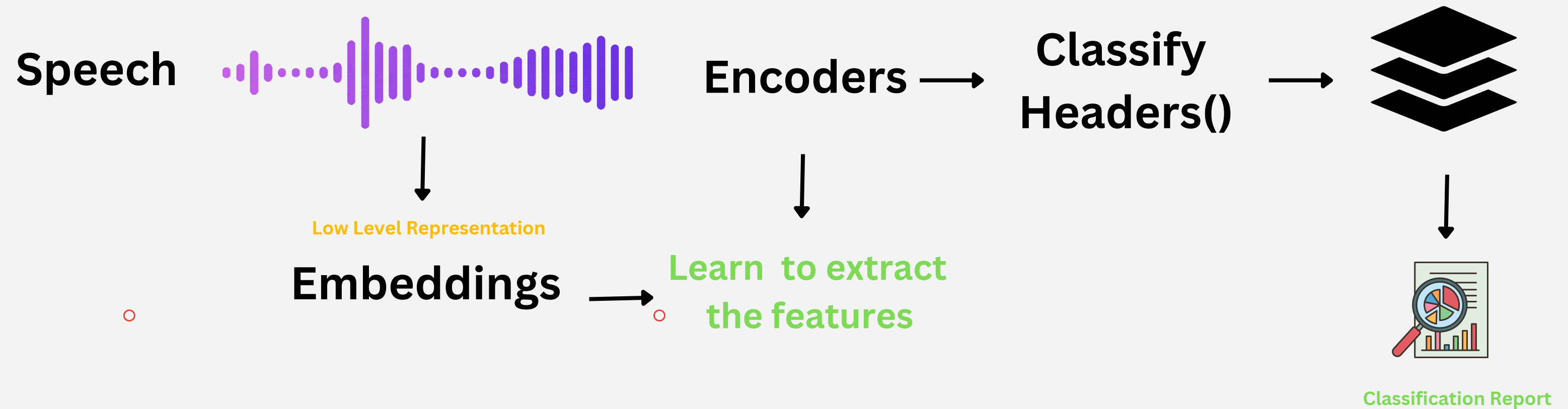
$$y = W * h + b$$

Audio Detection module



2. Audio Detection

Detecting audio is deepfake or not, using tortoise model.



Alerting module



Telegram Encopration with onsite anomaly capturing

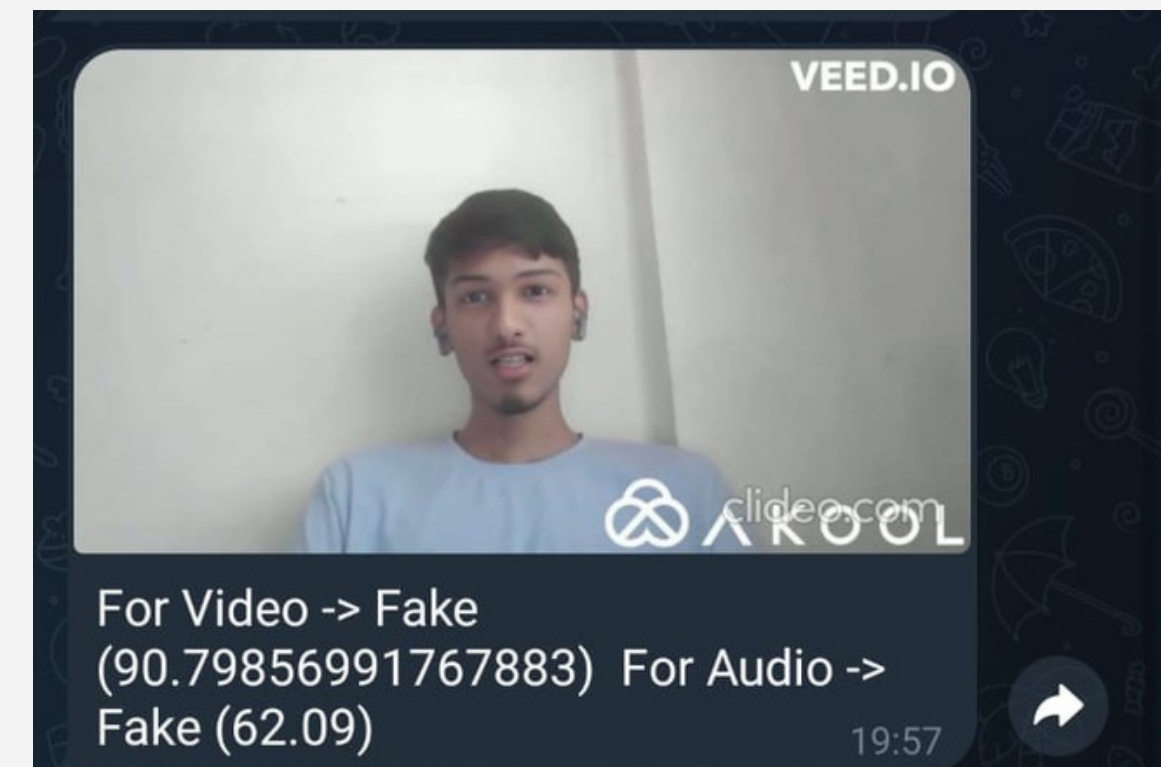
Steps: Fake



Highest Predection Frame

data={Frame,class}

Telegram(data)



Novelty of System



Mesonet over ELA

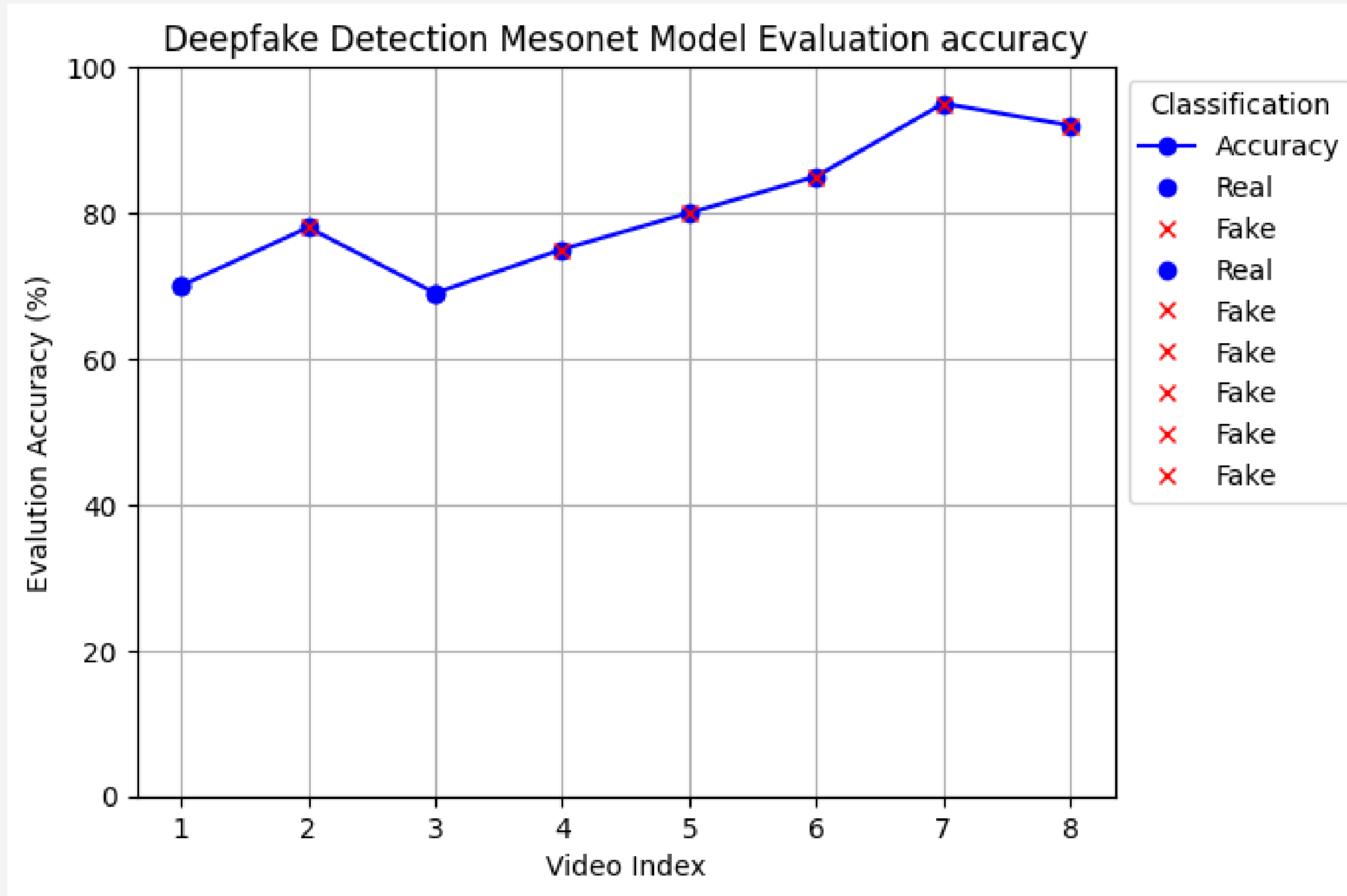
Instead of using traditional error level analysis (ELA) we have used mesonet to increase accuracy.

Alerting module

Alerting module is integrated if video found fake.

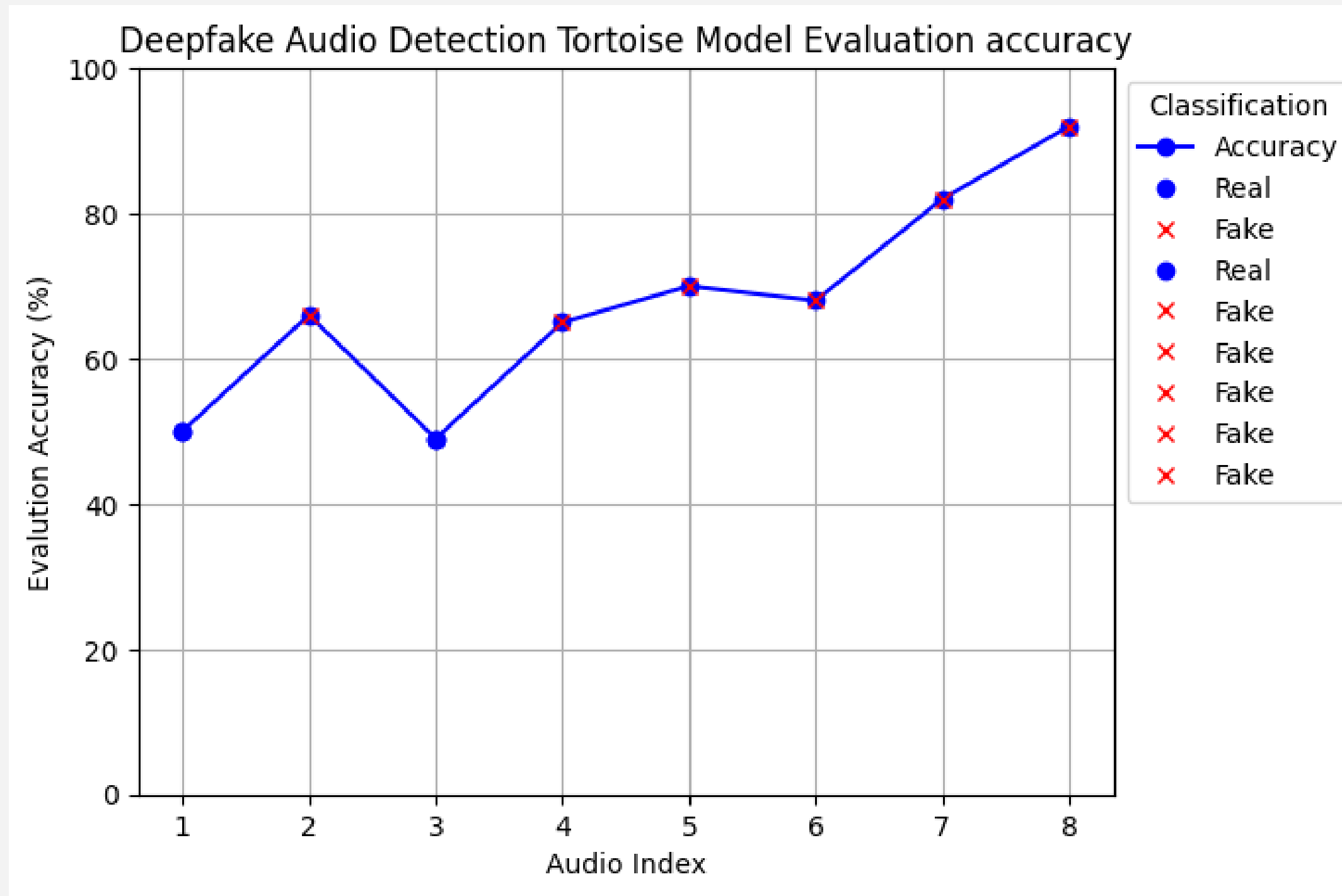


Results: Video deepfake detection





Results: Audio deepfake detection





Q Conclusion



- A little contribution to humanity in order to help police and common citizens to live without any fear.
- To solve deepfake cases easily and timely with accurate prediction.
- It proves “No matter how Dark it gets, Light of truth and wisdom will always find it’s way out.”



Thanks



Do you have any questions?

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