**REVEALING AND CLASSIFICATION OF DEEP FAKE IMAGES WITH VIDEOS USING CUSTOMIZED DEEP LEARNING MODELS**

# Abstract

Deep fakes are becoming more common; they include editing previously published films and photos to produce content that appears authentic but is wholly fake. The proliferation of accessible deep learning methods, including **Generative Adversarial Networks (GANs)**, auto encoders, and user-friendly software, has greatly streamlined the creation process. These sophisticated algorithms adeptly fuse and modify visual and audio elements, facilitating the production of content that closely mimics genuine footage, even for those without specialized knowledge. The malicious manipulation of images and videos poses significant security and societal concerns. This project aims to develop a deep learning model to detect and classify deep fake images and videos, focusing on facial manipulations. The dataset used for the project is either  **Face Forensics++, Celeb-DF,** or the **Deepfake Detection Challenge** **Dataset (DFDC)**, available on Kaggle, consisting of real and deepfake videos. Commencing with preprocessing the data, extracting frames from the videos, and separating the dataset into training and validation sets. For the detection and classification of deepfake images and videos, **OpenCV** and **face\_recognition** for facial detection, followed by feature extraction using pre-trained models like **VGG16**or**ResNet50**. A bespoke deep learning model is then constructed using **Keras** and **TensorFlow,** trained on the extracted facial features for classification purposes. Various techniques such as data augmentation, learning rate scheduling, and early stopping enhance model performance. This comprehensive approach ensures accurate discrimination between authentic and deep fake content, addressing concerns regarding the integrity of digital media.

Keywords:

Deepfake Detection, Video Forgery Detection, Image Forgery Detection, Custom Deep Learning Models, Transfer Learning, Fine-Tuning, and Data Augmentation.