



# Deepfake Detection in image using ML

Yashkumar Mayani (92310103058), Pradip Chavada (92310103082), Prof. Reshma Sunil

## Abstract

This study looks at five Convolutional Neural Network (CNN) architectures: ResNet, EfficientNet, MobileNet, Xception, and DenseNet. These models are used for deepfake image classification. As generative techniques like StyleGAN and FaceSwap produce more realistic fake media, reliable detection is crucial for preserving digital integrity.

A dataset of  $512 \times 512$  images was gathered from FaceForensics++ and other public sources. This dataset includes various manipulation methods. All models were trained under the same conditions, using binary cross-entropy loss and the Adam optimizer. Consistent preprocessing steps included CLAHE, normalization, and bicubic resizing.

We evaluated model performance based on accuracy, precision, recall, F1-score, and inference time. The results show distinct trade-offs between detection accuracy and computational efficiency. This information helps in choosing CNN architectures for real-time deepfake detection tasks, such as social media monitoring and forensic analysis.