IJARSCT
International Journal of Advanced Research in Science, Communication and Technology
International Open-Access, Double-Blind, Peer-Reviewed, Refereed, Multidisciplinary Online Journal
ISSN: 2581-9429
Volume 5, Issue 3, May 2025
Impact Factor: 7.67

Deepfake Detection

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Abstract: *The rapid advancement of deepfake technology has raised significant concerns regarding misinformation, security, and digital forensics. Various deepfake detection methods have been explored, leveraging both traditional machine learning (ML) techniques and advanced deep learning architectures. While early detection methods relied on handcrafted feature extraction, their effectiveness was often limited due to poor generalization and susceptibility to adversarial modifications. More recent approaches integrate deep learning frameworks such as Convolutional Neural Networks (CNNs) and Recurrent Neural Networks (RNNs) to improve detection accuracy.*

The project addresses the growing concern of deepfake detection by utilizing advanced techniques, including ResNext and LSTM models, along with deep learning methods. It features a Django web application designed to identify deepfake videos effectively. The process involves extracting frames from uploaded videos and splitting them into a specified number of frames. Subsequently, Python libraries for facial recognition and C++ visual tools are employed to detect faces in the video frames. The trained models, tailored to analyze various frame sequences, are then implemented to determine whether the video is authentic or artificially manipulated.

Keywords: Deepfake detection, Machine Learning, Deep Learning, Convolutional neural network (CNN), ResNext, Long Short-Term Memory (LSTM)

DOI: 10.48175/IJARSCT-26342