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"AI POWERED DETECTION OF DEEPFAKE MEDIA WITH REAL TIME INSIGHTS"

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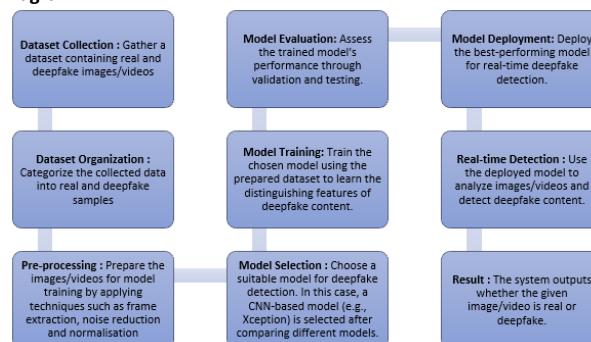
Session: 2024-25

Abstract: A number of methods for altering faces in films have been effectively created and made publicly accessible in recent years (e.g., Face Swap, deepfake, etc.). Using these technologies, it is possible to facilitate face video modifications with inaccurate results. It is employable in almost all fields. However, the overemphasis of all technologies is fatal prone to have a certain effect in society which may be negative (e.g., fake news, and cyberbullying revenge porn). It is therefore important to be able to tell whether a person's face in a video has been modified, subjectively. To be able to address the problem of deepfake videos, we focus on the problem of face alteration detection in video sequences. In particular, we focus on the ensembles of several Convolutional Neural Network (CNN) models that have been developed.The proposed methodology attains these objectives through the use of attention layers and data training powerful models derived from a base network, EfficientNetB4.

Introduction: This means that a speaker's identity can be changed with a moderate amount of effort. Digital face editing tools are now easy to use making them accessible to everyone regardless of art or picture retouching experience. Users can now started accessing artificial tools that effectively handle tasks by themselves . New artistic developments help people create better art with their technological tools. Advanced technology enables criminals to produce false videos with relative ease. Face-altering technology poses dangers because attackers can spread fake videos and create illegal revenge pornography. Establishing true identities in video sequences stands as today's major concern because spreading fake content creates serious problems for society .

**Block Diagram:**
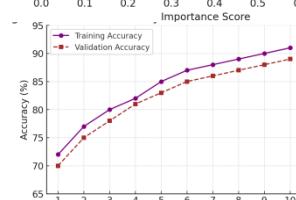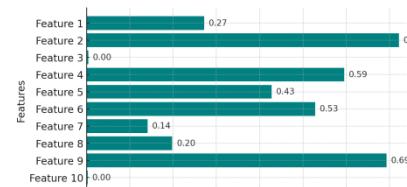
Future scope:

- Real-Time Detection Systems:
- AI-Driven Adaptive Models
- Multi-Modal Detection Approaches
- Quantum Computing for Deepfake Detection
- Improved Dataset and Benchmarking
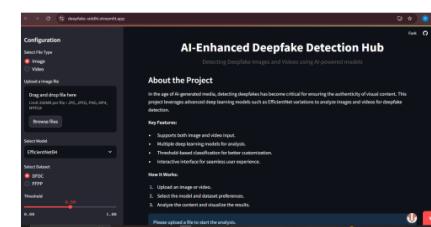
Reference: [1] M. Zoller, J. Thies, P. Garrido, D. Bradley, T. Beeler, P. Prez, M. Stamm Inger, M. Niner, and C. Theobald, "State of the art on monocular 3d face reconstruction, tracking, and applications," *Computer Graphics Forum*, vol. 37, pp. 523–550, 2018.[2] J. Thies, M. Zoll Hofer, M. Stamm Inger, C. Theobald, and M. Neuner, "Face2face: Real-time face capture and reenactment of grub videos," in *Proceedings of the IEEE conference on computer vision and pattern recognition*, 2016, pp. 2387–2395.[3] J. Thies, M. Solnhofen, and M. Neuner, "Deferred neural rendering: Image synthesis using neural textures," *ACM Transactions on Graphics (TOG)*, vol. 38, no. 4, pp. 1–12, 2019.
[4] "Deepfakes GitHub, https://github.com/deepfakes/faceswap.
[5]"Faceswap,"
https://github.com/MarekKowalski/FaceSwap/.

Analysis:

Model's Transcription:

Conclusion: Deepfake image and video detection has become an essential field of research due to the increasing misuse of AI-generated media for misinformation, identity theft, and fraud. This thesis explored various deep learning models, including EfficientNetB4, EfficientNetB4ST, EfficientNetAutoAttB4, and EfficientNetAutoAttB4ST, integrated with machine learning classifiers such as Random Forest, Logistic Regression, Naïve Bayes, and K-Nearest Neighbors (KNN). The experimental results demonstrated that these models effectively differentiate between real and fake media, with varying levels of accuracy and computational efficiency.