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

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# 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 development process has been considerably expedited by the widespread availability of deep learning techniques, such as autoencoders, Generative Adversarial Networks (GANs), and user-friendly software. 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. With an emphasis on facial alteration, the goal of this research is to create a deep learning perfect for the detection and classification of deepfake images and videos. 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 images and videos. By utilising Recurrent and Convolutional Neural Networks, we have made development in DF detection. 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, Convolutional neural networks (CNNs) are used by the system to extract features at the frame level. A recurrent neural network is trained using these features (RNN). 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:

Deep fake video Detection, Image Forgery Detection, Image Forgery Detection, Custom Deep Learning Models, Fine-Tuning.