Deep Fake Detection using Recurrent Neural Network

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Index

Introduction to the problem

- It is easy to create believable face swaps in videos that leaves few traces of manipulation.
- These realistic fake videos are used to create political-distress, blackmail someone or fake terrorism events are easily envisioned.

Literature Review

Name of the Paper	Inference
Deepfake Video Detection Using Recurrent Neural Networks	RNN is used for competitive result in this task while using simple architecture.
A Qualitative Survey on Deep Learning Based Deep fake Video Creation and Detection Method	CNN pre-trained model can be used for feature extraction and RNN for sequence processing.

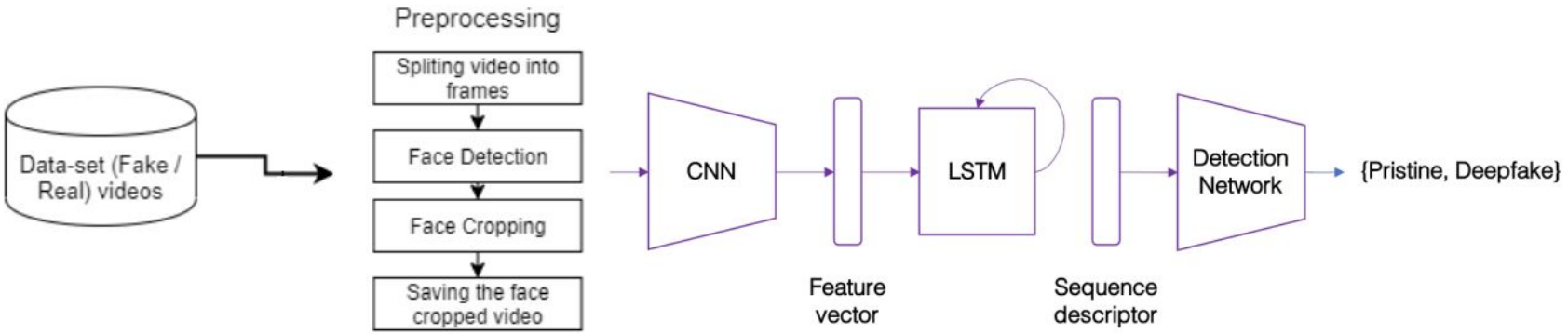
Datasets

Name	Details
FaceForensics++	FaceForensics++ is a forensics dataset consisting of 1000 original video sequences that have been manipulated with four automated face manipulation methods: Deepfakes, Face2Face, FaceSwap and NeuralTextures.
Celeb-DF	The Celeb-DF dataset includes 408 original videos collected from YouTube with subjects of different ages, ethic groups and genders, and 795 DeepFake videos synthesized from these real videos.
Deepfake Detection Challenge	Kaggle’s Deepfake Detection Challenge dataset consisting of 800 videos. (50% training, 50% testing)

Problem Statement

- To design and develop a deep learning model for Deep fake video detection using Recurrent Neural Network

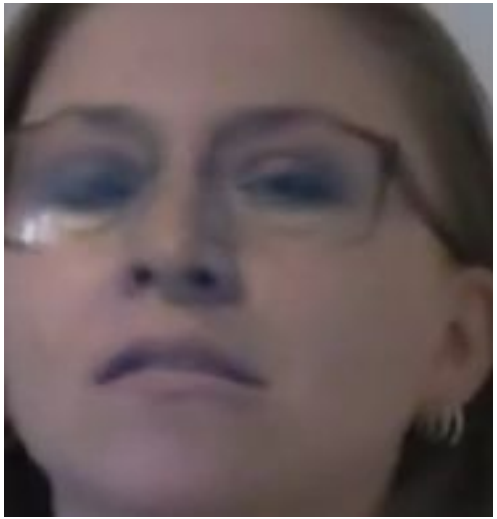
Architecture Diagram



Progress

- Explored the related work (Literature review).
- Collected three datasets.
- Preprocessed the data.
- Finalised the approach for the model training.

Preprocessing



Conclusion and Future work

- It is important to have a efficient algorithm for Deepfake detection which provides good result and at same time computationally less intensive.
- A competitive result can be achieved using RNN model with simple architecture.
- We are using three different datasets that are diverse in their own way.

Reference

- Güera, D. and Delp, E.J., 2018, November. Deepfake video detection using recurrent neural networks. In 2018 15th IEEE international conference on advanced video and signal based surveillance (AVSS) (pp. 1-6). IEEE.
- Rahman, A., Islam, M.M., Moon, M.J., Tasnim, T., Siddique, N., Shahiduzzaman, M. and Ahmed, S., 2022. A Qualitative Survey on Deep Learning Based Deep fake Video Creation and Detection Method. Aust. J. Eng. Innov. Technol, 4(1), pp.13-26.
- https://github.com/datamllab/awesome-deepfakes-materials