

Detecting Generated Face Images, Analysing Emotional Disparities and Bias

Group 72:

Name	Student ID
Srijita Sarkar	s242527
Agathe d'Aubenton-Carafa	s243230
Upasana Paul	s242577
Gokul Desu	s242580

Motivation:

In these last few years, image generation has developed considerably, achieving a realism that makes it difficult for humans to tell if the image is real or synthesised. In the meantime, problematic uses of generated images arose, with the main one being truth manipulation. Because of social media, we live in a world where visuals matter a lot. Thus it is really important to know if the images we see are real or not, as it can influence the way information is perceived or even propagate fake news.

Background:

In the past few years, there has been a lot of progress in generating and detecting synthetic images. Wang et al. used semantic masks as an attention-based data augmentation module to detect facial features in celebrity images [1]. Hsu et al. worked on generating fake-real image pairs using GANs and then DenseNet to train using pairwise learning to distinguish between real and fake data [2]. Tariq et al. proposed a neural network-based *FakeFaceDetect* framework to detect deepfakes created by GANs [3].

Milestones:

In the upcoming three weeks, we aim to achieve several project milestones, including a literature review, gathering datasets of generated and real faces, choosing and fine-tuning an appropriate model for detecting the generated faces and analysing our results to detect if these generated faces dataset have some bias. We also plan to perform emotion detection in both fake and real faces and make a report and poster showcasing our project findings as stated in the requirements.

References:

1. R. Wang, Z. Yang, W. You, L. Zhou and B. Chu, "Fake Face Images Detection and Identification of Celebrities Based on Semantic Segmentation," in IEEE Signal Processing Letters, vol. 29, pp. 2018-2022, 2022, doi: 10.1109/LSP.2022.3205481
2. C-C Hsu, Y-X Zhuang, and C-Y Lee, "Deep Fake Image Detection Based on Pairwise Learning" Applied Sciences 10, no. 1: 370, 2020, doi: 10.3390/app10010370
3. S Tariq, S Lee, H Kim, Y Shin, and S S. Woo, "GAN is a friend or foe? a framework to detect various fake face images." In Proceedings of the 34th ACM/SIGAPP Symposium on Applied Computing (SAC '19). Association for Computing Machinery, New York, NY, USA, 1296–1303, doi: 10.1145/3297280.3297410
4. We plan to use: <https://www.kaggle.com/datasets/xhlulu/140k-real-and-fake-faces>