Face Multiclassifier Project Report

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AI-Frameworks

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Introduction

Data Cleaning

Label-Data Cleaning

Image-Data Cleaning

- Convert all image filetypes to .jpg
- For videos, take the first frame and convert it to .jpg

Image Preprocessing

Grayscale Conversion

Face Detection

Resizing

Normalization

Data Augmentation

- Flipping
- Rotating
- Brightness
- Contrast

Face Detection

Models

Haarcascade Frontal Face

MTCNN

RetinaFace

Retinaface.

Threshold	Total faces detected	0 faces detected (fallback crop)	Average faces per image with detection
0.9 (default)	152	12	1.73
0.7	163	11	1.83
0.6	168	11	1.85
0.5	167	11	1.88
0.4	171	10	1.90
0.35	175	10	1.94
0.1	195	6	2.07

Face Recognition

Models

OpenCV LBPH Face Recognizer

Facenet

Sourcecode

All source code for this project can be found on my github page:
https://github.com/NeYoNmoos/Face_Multiclassification_Thomas-More

Conclusion

Takeaways

Challenges

AMD GPU Support

Since there is no Cuda support for AMD graphics cards, and the other solutions for AMD graphics cards did not work with my setup, I had to rely on the CPU only.
This restriction made it rather tedious to create cutouts

Sources

RetinaFace: Single-stage Dense Face Localisation in the Wild
(https://arxiv.org/pdf/1905.00641)

Facenet, Openface, Arcface comparison
(https://www.researchgate.net/publication/377935125_Comparative_Analysis_of_State-of-the-Art_Face_Recognition_Models_FaceNet_ArcFace_and_OpenFace_Using_Image_Classification_Metrics#:~:text=Even%20while%20ArcFace%20and%20OpenFace,applications%20where%20accuracy%20is%20crucial)

Facenet, LBPH, face_recognizion comparison
(https://www.hackerox.com/blog-detail/attendance-tracker-face-off-which-face-recognition-model-reigns-supreme)