

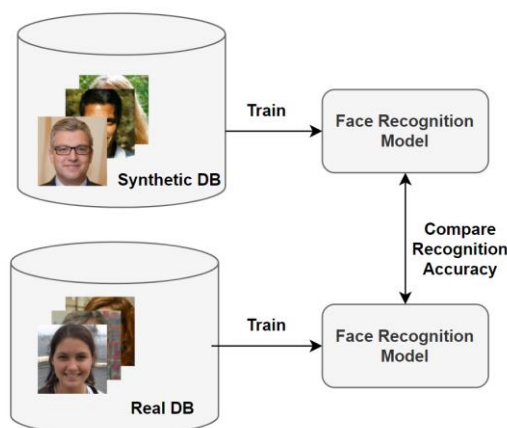
Norwegian Biometrics Laboratory (NBL) is a distinguished research lab contributing actively to the biometrics research across Europe. NBL spans its expertise over physiological and behavioral biometrics including 2D & 3D face, iris, fingerprint, hand vein, gait, keystroke, gesture and mouse dynamics recognition.

Master Thesis

Train Face Recognition Systems on Synthetic Datasets

OBJECTIVES & GOALS:

Synthetic face images gain more and more attention as the performance of deep generative networks continuously improves. Recently, the NVIDIA development team published StyleGAN2, capable of generating highly realistic synthetic face images that are non-distinguishable from real face images. Previous works have shown that the internal structure (latent space) of StyleGAN2 learns to break down individual features necessary to generate arbitrary faces. In this context, the main goal of this thesis is to generate datasets composed of synthetic face images by approximating the conditions given in real-world datasets. After the synthetic datasets are completed, you will train a face recognition system, comparing the recognition accuracy to face recognition systems trained on real reference datasets. This thesis will address the question of whether privacy issues caused by processing real data can be reduced by the substitution of synthetic data.



TASKS:

- Generation of representative synthetic datasets using generative adversarial networks
- Train different face recognition systems on the synthetic datasets
- Compare the recognition accuracy between the face recognition systems trained on synthetic vs real datasets

PREREQUISITES:

- Interest in Deep Learning and Biometrics
- Basic Python and Tensorflow/Pytorch skills

FURTHER READING:

- H. Qiu, B. Yu, D. Gong, Z. Li, W. Liu and D. Tao, *SynFace: Face Recognition with Synthetic Data*. In Proc. of the IEEE/CVF Intl. Conf. on Computer Visio, pp. 10880-10890, 2021.

CONTACT:

- Marcel Grimmer (marceg@ntnu.no)
- Prof. Dr. Christoph Busch (christoph.busch@ntnu.no)
- Prof. Dr. Raghavendra Ramachandra (raghavendra.ramachandra@ntnu.no)

NOTE: Highly qualified foreign students can get financial support to cover cost of an internship.