



ID card face match

Biometric verification using ID card facial image



Purpose

Interactive solution that demonstrates state-of-the-art face recognition technology and the capabilities of Electronic Machine Readable Travel Documents (eMRTDs).



Faces visible to a camera are compared with the facial image of a cardholder stored on an ID card.

ID card facial image

The ID card's ePassport (eMRTD) applet stores digitally signed personal data of the cardholder.

- Facial image (480x640 JPG 20KB) is downloaded from the ID card
- Authenticity of the data and the chip is cryptographically verified
- Data download from the card takes around 10 seconds



Face detection

Faces visible to a camera are detected using OpenCV's DNN module that uses a deep-learning-based face detection model.



Face verification

The face verification relies on dlib's face recognition library. The model used by the library was trained on a dataset of about 3 million faces and has an accuracy of 99.38%.

Faces are considered a match if the euclidean distance between the face vectors is 0.5 or less (percentage > 50%).



Supported ID cards



Estonian identity card (> 2021-08-23)



Estonian residence card (> 2018-12-12)



Latvian identity card (> 2019-09-02)

GPU acceleration



CuPy

CUDA-compatible NVIDIA graphics card is used to accelerate:

- Face verification: dlib compiled with CUDA support
- Image processing: using CuPy (CUDA-accelerated NumPy library)

The DEMO machine has "Intel Core i7-4770@3.40GHz" CPU and "NVIDIA GeForce GTX 750 Ti" GPU.

This configuration achieves the frame rate of 15 FPS at 1080x1920 resolution, while only 6 FPS when no GPU acceleration is used.

Credits



Arnis Parsovs (concept, programming)



Burak Can Kus (programming)



Geio Tischler (design)

Financial support:

- European Social Fund via "ICT programme" measure
- Ministry of Economic Affairs and Communications



Privacy policy

The DEMO machine is not connected to the internet and no personal data is collected.

