h_da hochschule darmstadt fachbereich informatik

member of EUT+ EUROPEAN UNIVERSITY OF TECHNOLOGY

ATHENE National Research Center for Applied Cybersecurity

– Master-/Bachelor Thesis –

Representation learning for Visual Human Characteristics

da/sec

da/sec is the biometrics and security research group and is affiliated with Hochschule Darmstadt and the National Research Center for Applied Cybersecurity (ATHENE). The group is led by Prof. Dr. Christoph Busch and Prof. Dr. Christian Rathgeb. The focus of the group is on highly innovative and applied security research in the special fields of biometrics. Read more on www.dasec.h-da.de.

Motivation & Goal

Contrastive Language-Image models are the basis of well-known tools such as Stable Diffusion or ChatGPT. Their objective is to accurately model the relationship between texts and images. This is achieved by learning representations for both image and text, such that distance between related items in embedding space is minimal. These representations can then in turn be used to realize a number of downstream tasks, such as classification, image caption generation or image generation. The goal of this work is to explore and adapt an appropriate state of the art vision-language or contrastive transformer foundation model and realize the downstream task of image captioning/question answering. That is, given a biometric face image, generate an accurate description of the human characteristics of the subject.

Tasks

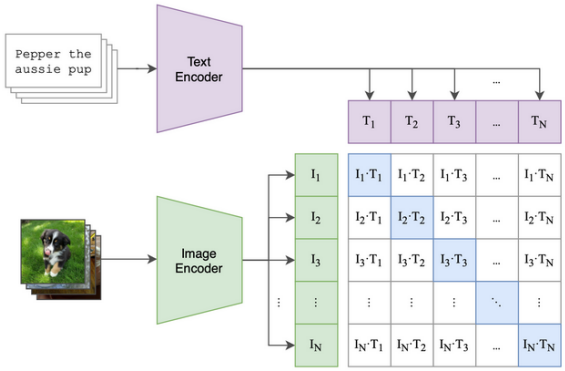
- Analyse the State of the art of multi-modal representation learning.
- Train Uni- or Multi-modal model(s) to represent typical human attributes.
- Evaluate accuracy and robustness of the models prediction.

Requirements

- High motivation, interest in security technologies and biometrics
- Good analytical skills
- Programming proficiency (preferably Python)

By Date

By now / by appointment



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