DEPARTMENT HEAD

BSc Thesis Task Description

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Face attribute recognition using efficient neural networks

Advancements in deep learning and computer vision in the past decade have made it possible to create and utilize neural networks capable of accurately classifying, segmenting or detecting objects in images. Face attribute recognition is an image classification task with many real-world applications from face recognition to person identification. Many use cases of face attribute recognition take place in edge devices, such as mobile phones or IoT devices, which have limited resources. Therefore, the use of efficient neural networks becomes increasingly important. Various efficient, lightweight architectures have been developed over the years, such as MobileNets or EfficientNet, which can work on resource-constrained devices.†[1]

This thesis aims to create different models based on existing efficient neural network architectures that can classify different facial attributes on face images.

The following subtasks should be elaborated:

- **Research and study the relevant literature** on efficient neural networks, and image classification focusing on face attribute recognition.
- **Search for databases** of face images that are labeled with facial attributes.
- **Create an input pipeline** that is preprocessing the images for the model. Split the dataset into train and test sets.
- **Implement the model**, and define evaluation metrics for training.
- **Train and test models** and compare their results based on the defined evaluation metrics.
- **Create a deployment application** to demonstrate the capabilities of the best model.
- **Prepare detailed documentation** about the work, summarize the results and write a conclusion.

Academic supervisor: Bálint Gyires-Tóth, PhD

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Dr. Pál Varga
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[1] †: Generative AI was used to enhance language quality.

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