

# Visual Age and Gender Classification by using Convolutional Neural Network

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## 1. Background

This study concerns developing a deep learning algorithm to resolve the face and gender classification problem. This method is useful to detect the other people's age and gender in the social platforms, dating applications etc. This method is also useful in the airport and casino security systems.

This project would be geared as an application which can be tested. Our team will be influenced by previous work in this subject, especially a project by Levi and Hassner, published in the IEEE Workshop on Analysis and Modeling of Faces and Gestures (AMFG), at the IEEE Conf. on Computer Vision and Pattern Recognition [1].

## 2. Methodology

In order to train our model, we will use convolutional neural networks (CNN) on facial images to classify age and gender. Empirical evidence shows that CNNs have been effectively used for purposes such as facial recognition [2].

The images will be extracted from the Adience database, which have a benchmark for age and gender classification. These images represent some of the challenges of age and gender estimation from real-world, unconstrained images (most notably: extreme low-resolution blur, occlusions, out-of-plane pose variations, expressions, etc.). The data included in this collection will try to be as true as possible to the challenges of real-world imaging conditions. It attempts to capture the subtle variations in appearance, lighting and other variables that can be expected of image imperfections [3].

## 3. Experiments

The dataset, which contains 26,580 photos of 2,284 unique subjects, in this study is publicly available in Gil Levi and Tal Hassner's website and other supplemental materials are provided under their designated GitHub page.

The models will be run in the Python programming by using Keras library and Tensorflow which has capacity to run the large-scale deep learning algorithms.

Non-trained CNN will be running first to make hyperparameter tuning. Following this step, the publicly available pre-trained networks' layer weights will be leveraged into our CNN architecture which calls transfer learning (TL). For the model objectivity, the 5-fold cross validation, 10-fold cross validation and the data augmentation regularization method will be used.

After the calculation stage, each model's accuracy will be compared to each other. These comparisons will be done by using the different age ranges (0-2, 4-6, 25-32, 48-53, 60+ e.g.) and different genders (male, female, and both).

## References

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