

Title: Deep Multi-task Learning for Face Beauty Prediction

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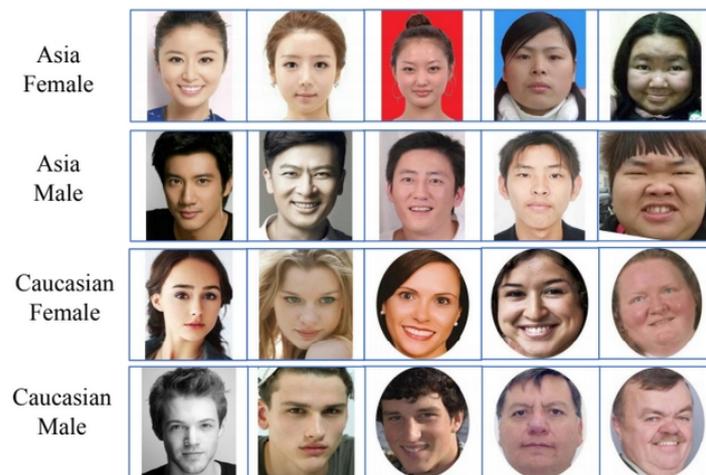
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Context

Faces and their images play an important role in our life. Faces convey many kinds of information, like identity, gender, race, age, emotions, health, personality, and attractiveness. Pursuing beauty, especially facial beauty is embedded in our nature as human beings, and our obsession with our physical image unconsciously controls our interaction in our society, and even more consciously with critical life decisions like mate choices and employment. Automatic aesthetic analysis has become a hot research topic due to the progress made in feature extraction and deep learning.

From the point of view of machine learning, one would like to build a system that automatically imitates humans when they score face beauty. Deep learning methods can be seen as a promising tool that can directly provide the class or score of a face. However, face beauty prediction can be affected by many factors such as gender and ethnicity of the subject. Face beauty prediction is not a standalone problem, but its estimation can be influenced by a number of heterogeneous and subtly correlated factors. For instance, when the gender and ethnicity of the subject are known in advance, it is expected that the face beauty predictor can provide better estimation.



Proposed work

This work aims to investigate the possibility of optimizing face beauty prediction (the main task) with related/auxiliary tasks, which can include ethnicity and gender classification.

Specific tasks:

1. Studying deep learning and face beauty prediction.
2. Implementing and comparing several schemes (hierarchical vs. non hierarchical) and one deep single task learning vs. deep multi-task learning.

3. Evaluation of the performance on the datasets SCUT, M²B, and SCUT-FBP5500.

Duration: 5 months.

Required knowledge:

Matlab programming, basics of pattern recognition and deep learning

REFERENCES

HyperFace: A Deep Multi-task Learning Framework for Face Detection, Landmark Localization, Pose Estimation, and Gender Recognition. IEEE TRANSACTIONS ON PATTERN ANALYSIS AND MACHINE INTELLIGENCE arXiv:1603.01249v3 [cs.CV] 6 Dec 2017