

# Automated Estimation of Human Age

Yaoyu Tao ([taoyaoyu@stanford.edu](mailto:taoyaoyu@stanford.edu))

## Motivation

Human face, as a window to the soul, conveys a significant amount of nonverbal information to facilitate the real-world human-to-human communications. Recall first time when you meet a person, you have the ability, probably developed early in life as a child, to accurately determine facial attributes such as identity, age and gender. We want a machine that can do the same job, as in some science-fiction films.

## Specifications

Particularly for this EE368 final project, we are aiming to estimate the human age only. If time permits, we can extend to identity or gender. We plan to develop a MATLAB application that can perform the following tasks on an input human face image:

1. Accurately recognize the human face as well as important facial aging features and patterns.
2. Given aging features/patterns, estimate the age range.

## Prior works

Age estimation by machine has been a challenging problem for long time. Different people have different rates of aging process, which is determined by not only the people's gene but also many factors, such as health condition, living style, working environment, and sociality.

Paper [1] – [4] introduce a few techniques to tackle this problem:

The system in [1] has to be performed on a large database, Yamaha gender and age (YGA) database that can be downloaded from web. Biologically-inspired features (BIF) were investigated for age estimation and showed good performance. Estimation performance can be further improved significantly when manifold learning uses BIF features. This could be a promising technique for us in terms of efficiency and manageability.

Paper [2] uses similar approach to that in [1]. It improves the BIF models and shows a better age estimation results. We will implement the improvements if time permits.

Paper [3] proposes a novel scheme for aging feature extraction and automatic age estimation. A new method (locally adjusted robust repressor) is introduced for robust learning and prediction of aging patterns. Experiments are performed on FG-NET database. Complexity of this method is higher.

Paper [4] introduces an estimation method called AGES. It models the aging pattern, which is defined as the sequence of a particular individual's face images sorted in time order, by constructing a representative subspace.

### **Current Plan**

We plan to have a more comprehensive literature review in the age estimation and pick a manageable and promising candidate to start. We will focus on implementing the system for next few weeks.

### **Android Device?**

No; We will test our system in laptop with MATLAB. If time permits, we can extend it to Android device to make it an age estimation app.

### **References**

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