

An Overview of Two Age Synthesis and Estimation Techniques

Milad Taleby Ahvanooy^{1*}, Qianmu Li¹

1. School of Computer Science and Engineering, Nanjing University of Science and Technology, Nanjing, P.O. Box 210094 P.R, China. e-mail: taleby@njjust.edu.cn, Qianmu.@njjust.edu.cn

Abstract

Age estimation is a technique for predicting human ages from digital facial images, which analyzes a person's face image and estimates his/her age based on the year measure. Nowadays, intelligent age estimation and age synthesis have become particularly prevalent research topics in computer vision and face verification systems. Age synthesis is defined to render a facial image aesthetically with rejuvenating and natural aging effects on the person's face. Age estimation is defined to label a facial image automatically with the age group (year range) or the exact age (year) of the person's face. In this case study, we overview the existing models, popular techniques, system performances, and technical challenges related to the facial image-based age synthesis and estimation topics. The main goal of this review is to provide an easy understanding and promising future directions with systematic discussions.

Key words: Facial aging, Age Progression, Age Synthesis, Age estimation;

1. Introduction

Age estimation and face verification have many applications in modern machine vision systems. Technically, age-separated facial images contrast significantly in both texture and shape. In general, the human face has important amount of attributes and features such as gender, expression and age. The most of people can easily recognize human characteristics like emotional filings, where they can guess if the human is sad, angry or happy from the face. In the same trend, it is easy to detect the gender of the human. However, predicting human age just by looking at recent or old pictures, is an unpredictable challenge for modern computer vision systems in new daily life. Commonly, the facial aging attributes depend on many impressive factors such as degree of stress and life style. For example, smoking causes several facial attributes changes [1-3].

During the last two decades, many researches and survey papers have been written to introduced various aspects of age estimation and facial aging techniques. Some provide profound introductions to the age estimation and modeling as a whole. However, there has been written no new overview on computer-based age synthesis and estimation in recent years, and most of the newcomers in computer vision aim to learn about age estimation