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# Face-Based Automatic Personality Perception

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## ABSTRACT

Automatic Personality Perception is the task of automatically predicting the personality traits people attribute to others. This work presents experiments where such a task is performed by mapping facial appearance into the Big-Five personality traits, namely Openness, Conscientiousness, Extraversion, Agreeableness and Neuroticism. The experiments are performed over the pictures of the FERET corpus, originally collected for biometrics purposes, for a total of 829 individuals. The results show that it is possible to automatically predict whether a person is perceived to be above or below median with an accuracy close to 70 percent (depending on the trait).

**Categories and Subject Descriptors:** J.4 [Computer Applications]: social and behavioral sciences; H.4.3 [Information Systems Applications]: Communications Applications. **General Terms:** Human Factors, Experimentation. **Keywords:** Automatic Personality Perception, Eigenfaces, Big-Five.

## 1. INTRODUCTION

The social cognition literature shows that people attribute personality traits to others in less than one second after the first contact [11]. The main interest of attributed traits is that they are predictive of how others behave towards a certain person and, furthermore, they explain better than self-assessed traits the social characteristics of an individual [14]. Trait attribution was shown to take place not only during face-to-face encounters, but also during the consumption of multimedia material (e.g. when people see someone on television), an effect known as *Media Equation* [6]. Therefore, a large body of previous research work has aimed at automatically predicting the traits people attribute to unacquainted others they observe in multimedia material [12].

So far, research on Automatic Personality Perception (APP) has focused mainly on nonverbal behavior (paralanguage, fidgeting, gaze, etc.) and online activities (tagging images

as “favorite” on Flickr, Facebook profiles, etc.) [12]. In parallel, research on face analysis has targeted the recognition of facial expressions [2], emotions and the inference of attractiveness [3]. The problem of automatically mapping facial appearance into personality traits has been largely neglected in the computing literature (see [12] for the few works that consider the problem). This work aims at filling, at least partially, such a gap and proposes experiments aimed at predicting whether people perceive an individual portrayed in a picture to be above or below median with respect to each of the Big-Five Traits [5].

The experiments have been performed over the frontal face images of the Color FERET database, a corpus originally collected for biometrics purposes (see Section 2). The most challenging aspect of such a corpus is the wide variety in terms of ethnicity, clothes, haircut and any other characteristics that contribute to facial appearance. From this point of view, this work is an advancement with respect to previous experiments that have focused on synthetic faces [7]. In particular, the experiments of this work can be considered more realistic and representative of everyday situations where people observe the portraits of unknown individuals (e.g., profile pictures on social media, testimonials in advertisements, etc.).

The experiments involve a large sample of 829 individual faces. The largest corpus for face-based APP presented so far in the literature includes only 300 different faces generated artificially [7]. The main advantage in increasing the number of facial images is not only that the statistical reliability of the results improves, but also that it is possible to observe weaker effects (e.g., correlation between features and traits) that might not reach statistical significance with a smaller number of facial images.

The rest of the paper is organized as follows: Section 2 describes the data collection process, Section 3 presents the proposed approach, Section 4 reports on experiments and results, and the final Section 5 draws some conclusions.

## 2. THE DATA: FACE AND PERSONALITY

The corpus used for the experiments is a selection of 829 images of real faces (a total of 829 different individuals) from the Color FERET database<sup>1</sup>, a benchmark for face recognition technologies collected between December 1993 and August 1996. All the selected images are in color and portray individuals of different gender (478 males and 351 females) and ethnic background (63.9% White, 15.3% Asian/Pacific

<sup>1</sup><http://www.nist.gov/itl/iad/ig/colorferet.cfm>