SPATIO-TEMPORAL AND MULTIMODAL ANALYSIS OF PERSONALITY TRAITS

1. Introduction

Personality can be though as a description of important characteristics of individuals and it is an indispensable factor for accurate understanding and interpretation of individuals' behavior, and underlying mechanisms of behavior. For instance, personality traits can be employed to better assess psychopathology of patients as well as evaluating job applicants during interviews. Consequently, analysis of personality is an active area of research in several disciplines such as psychology, psychiatry, and neuroscience. With the advances in signal processing, computer vision, and machine learning, computer scientists have also started to focus on (automatic) analysis and synthesis of personality.

Recent studies on automatic analysis of personality report promising results, suggesting that computational models can estimate Big Five personality traits [8-10] from audiovisual cues (e.g., facial expression, voice, etc.). Yet, most of such studies try to recognize apparent personality, where the personality traits are labelled by observers. This is due to the fact that large/benchmark datasets (e.g., ChaLearn First Impression [1] and ChaLearn First Impression v2 [2]) contain annotations of apparent personality traits only. While there are a few works that analyze the relationship between real (self-reported) and apparent personality traits [3-7] using different modalities such as speech (audio/transcripts), facial appearance, expressions, etc., joint modeling of real and apparent personalities –to benefit from their complex relations– has not been studied yet.

Modalities used thus far for the automatic analysis of personality can be summarized as style/context of profile images and self-portrait images (selfies), speech content, facial appearance, facial expression, pose, gesture, gaze, and conversation/meeting characteristics (see [11][12] for further details on personality computing). Recent findings show that personality traits can also be correlated with individuals' perceptual characteristics (e.g., how they perceive and/or describe abstract images) [13]. On the other hand, such perceptual cues have been largely ignored in the area of personality computing.

The goal of this project is to develop reliable models for the multimodal analysis and interpretation of personality traits. In contrast to earlier studies, we aim to design and implement spatio-temporal architectures that jointly model apparent and real personality traits (as a multitask problem) through appearance and dynamics of (elicited) facial expressions, gesture, pose, and perceptual cues. To this end, a multimodal database will be collected during the workshop.

2. Tentative Work Packages

WP1 – Database Collection:

Participants will be video-recorded during three tasks such as self-description (speaking), watching emotion-eliciting videos, and performing a multichoice test to describe abstract images. Self-reported personality of each participant will be obtained through 10-item version of the Big Five Inventory (BFI-10) [9]. Furthermore, apparent personality traits will be annotated based on the recorded videos.

WP2 – Setup and Pre-processing:
Video and audio data will be pre-processed. Face tracking, pose estimation, and vocal feature extraction will be performed.

WP3 – Software Design & Development:
Spatio-temporal (multimodal) machine learning architectures will be designed and developed for joint modelling of apparent and real (self-reported) personality traits. Temporal dynamics of facial expressions, vocal features, and pose will be analyzed as well as correlating perceptual characteristics with personality. Combined modelling of different modalities and fusion of individual models will be analyzed.

WP4 – Analysis of Findings & Outcomes:
Findings, e.g., correlation between apparent and real personality traits, relation of different modalities, etc., will be analyzed.

3. Team

a. Involved Researchers

- Dr. Hamdi Dibeklioğlu, Asst. Prof.
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- Berhan Faruk Akgür, Ph.D. Student
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- Burak Mandıra, M.Sc. Student
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- Dersu Giritlioğlu, M.Sc. Student
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b. Prospective Researchers

We welcome participants with the following expertise and/or interest:

- Computer Vision
- Speech Processing
- Deep/Machine Learning
- Affective Computing
- Psychology / Experimental Psychology
- Neuroscience

References

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