

Toward real-time personality recognizer for
social human-robot interaction

Introduction

- X Personality is one of the typical behavioral traits of person in various situation. For a long time, the relationship between personality and human behavior has been studied in the field of psychology
- X To build more natural interaction between human and robot, robot needs to reliably recognize the psychological state of user.
- X This paper introduces a personality recognizer based on voice features that could be used for various human-robot interaction.

Personality and Big - 5 Personality Model

Personality : An image of a person formed in a social environment.

Character : A stable characteristic structure inherent in nature, reflects less on social and cultural characteristics.

Temperament : Characteristics affected by biological factors.1)

- Personality Theory

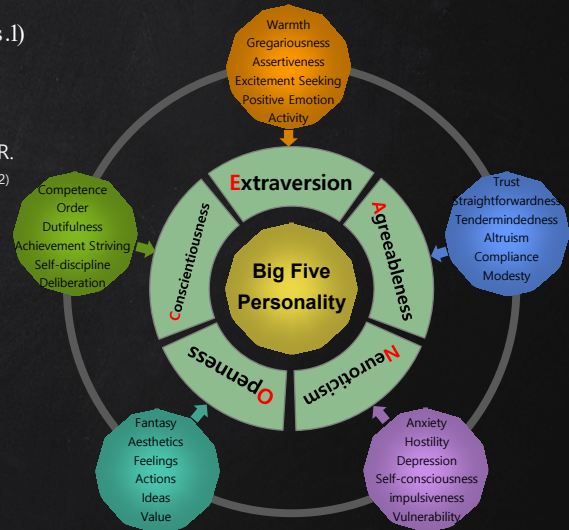
Freud : Psychological sexual theory

Erickson : Psychological social theory

Jung : Analytical psychology theory

⋮

McCrae, R. R.
Costa, P. T.²⁾

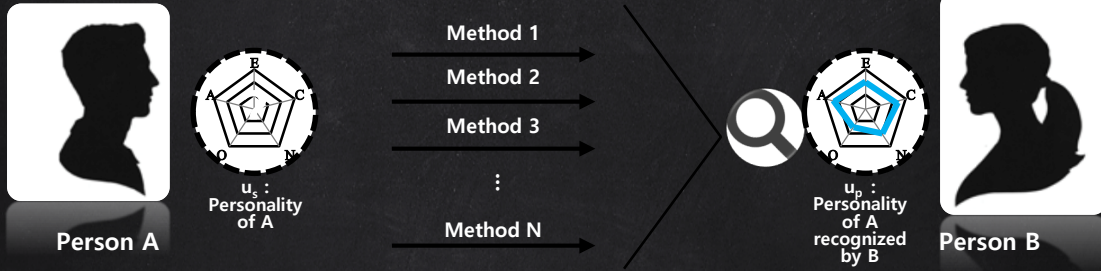


Big-5 Personality Model

1), Strelau, J. (1983). *Temperament- Personality - Activity*, Academic Press, London.2)

2), McCrae, R. R. & Costa, P. T. (May 1997). "Personality trait structure as a human universal". *American Psychologist* "

Previous Researches of Personality Recognition



Method 1	Method 2	Method 3	Method 4
<p>Social Relationship¹⁾²⁾</p>	<p>Decision in Situation³⁾⁴⁾</p>	<p>Behavior⁵⁾⁶⁾</p>	<p>Thin Slices of Behavior⁷⁾⁸⁾⁹⁾¹⁰⁾</p>

1), Colvin, C. R., & Funder, Predicting personality and behavior: A boundary on the acquaintanceship effect
 2), Kenny, D. A., A social relations analysis. New York: Guilford Press.
 3), Blackman, M. C., & Funder, The effect of information on consensus and accuracy in personality judgment.
 4), Use of categorical and individuating information in making inferences about personality.
 5), Funder, D. C., & Colvin, C. R. Explorations in behavioral consistency: Properties of persons, situations, and behaviors.

6), Gosling, S. D., Ko, S. J., Mannarelli, T., & Morris, A room with a cue: Personality judgments based on offices and bedrooms.
 7), J. Biel, "The YouTube Lens : Crowdsourced Personality Impressions and Audiovisual Analysis of Vlogs"
 8), L. M. Batrinca, "Please, tell me about yourself"
 9), F. Pianesi, "Multimodal recognition of personality traits in social interactions"
 10), A. V. Ivanov, "Space Speaks – Towards Socially and Personality Aware Visual Surveillance"
 11), K. Audhkhasi, A. "Personality Classification from Robot-mediated Communication Cues"

Material and Method

1. BFI-44-K

In order to access the personality profile of each subject we applied the Korean version of the BFI-44 personality inventory accordingly.

2. Data Acquisition

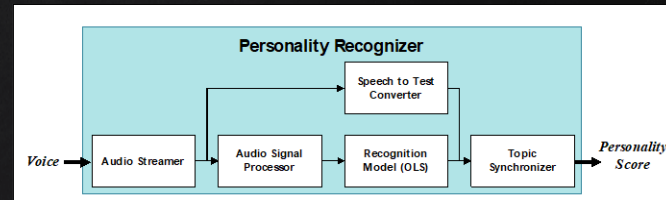
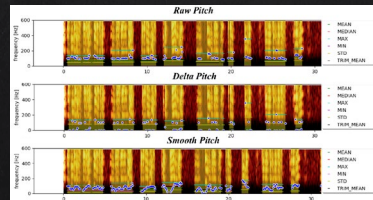
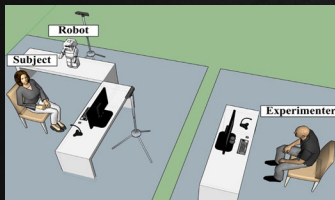
an experimental method to collect various types of non-verbal cues for personality recognition that could be used for reliable human-robot interaction.

3. Features

These features are pitch (fundamental frequency), intensity (energy), and on/off duration divided by Voice Activity Detection(VAD). Also, we made additional features which are delta(frame by subtracting), smooth(5 - pick moving average) pitch and intensity to consider the dynamic changes.

4. Recognition Framework

The system consists of multiple nodes as shown in the figure below, and each node operates on the ROS platform to operate in real time.



Conclusion

- X We have implemented the proposed system in a real robot and are doing analysis to find reliable correlation. We plan to build the verbal and non-verbal recognition model through the proposed system in the future and apply the model for a better interaction between human and robot.

Thank you.