Personality models *to* and *from* virtual characters

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1 Generation from personality

In order to be believable, virtual agents must possess both a behavioral model simulating emotions and personality, and a convincing aesthetics [4]. A lot of research already exists about models of emotions, and some seminal work investigates now the role of personality [1, 2]. While emotions are dynamic and variable in time, personality is a static feature of humans, changing only very slowly through the course of a life. The emotional state drives the style of the behavior of a character (how it accomplishes actions) the personality drives the intention of an autonomous agent (what to do next).

However, there is not much work investigating the relationships between the *personality* of a virtual agent, its *behavior*, and its *physical appearance*. The work that we are conducting in the SLSI group[1] is based on the observation that people very quickly build up their ideas about the personality of others in zero-acquaintance encounters [11]. The judgment of the personality can be modeled, for example, with the popular Five Factors Model [3], or according to dominance (has power and influence over others) and trustworthiness (able to be relied on as honest or truthful) [9].

Given a virtual character, from its appearance users assume a personality and expect a certain behavior. But to what extent must the simulated behavior match the assumed personality? How might a mismatch between assumed personality and actual behavior influence the acceptability of the virtual character? To support our investigations, we are developing a set of tools (see Fig. 1) for the generation of virtual characters from a given personality [8, 7, 6, 5].

2 Future extensions and applications

Our mapping methodology can be employed to learn the correlation between personality traits and other features, such as body postures, clothes, and hairstyle.

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Figure 1: Left: a screenshot of the GUI of our character generation prototype. Right: a character generated with a progression of Trustworthiness.

Additionally, the methodology is applicable beyond the realm of personality, to learn correlations for any term referring to a subjective concept, such as beautiful, scary, impressive, pitiful, and the like. Recently, Streuber et al. [10] applied this principle to physical descriptors of the body.

By conducting several online experiments, we will infer a collection of mappings between *terms* of subjective concepts and *physical attributes*. This dataset may have a number of possible applications:

Text-based generation of characters. Consider a textual description of a fictional character, and suppose there is an automated text analysis tool capable of extracting a quantified vector of the terms present in the database (e.g., *very dominant* or *somewhat scary*) from the input text. This would allow for an automated generation of a character's appearance from its textual description.

Generation of fictional characters. We can generate synthetic characters with unrealistic proportions. Some proportions, although unnatural, are nonetheless accepted by the community, as for example the heroic proportions of video game protagonists, idealized visions of body shapes, and cartoon-like characters. Psychologists might take advantage of this feature to investigate on the perception of personalities from subjects with manipulated appearance.

Appearance-centric transfer between models of first impression. The procedure mapping personalities to aesthetics can be inverted and used to predict how a certain body is perceived. For example, after generating a character from a Dominance/Trustworthiness model, it is possible to predict how the character would be perceived in the Five Factors Model, or to translate it into terms of subjective concepts (e.g., measure to what extent a dominant character is perceived as scary).

3 Conclusions

By combining reverse correlation experiments and virtual characters authoring tools, it is possible to create software products that (i) generate virtual characters from personality descriptions and (ii) predict what personality users will assume on first encounter of existing avatars. With our participation in the

Virtual Social Interaction (VSI) workshop, we aim at exchanging ideas about the possible applications of our work.

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