
Design of a fuzzy affective agent based on typicality degrees of physiological signals

Joseph Onderi Orero^a and Maria Rifqi^b

^aFaculty of Information Technology, Strathmore University, Kenya.
jorero@strathmore.edu

^bLEMMA, University Panthéon-Assas, France.
maria.rifqi@lip6.fr

Abstract. Physiology-based emotionally intelligent paradigms provide an opportunity to enhance human computer interactions by continuously evoking and adapting to the user experiences in real-time. However, there are unresolved questions on how to model real-time emotionally intelligent applications through mapping of physiological patterns to users' affective states.

In this study, we consider an approach for design of fuzzy affective agent based on the concept of typicality. We propose the use of typicality degrees of physiological patterns to construct the fuzzy rules representing the continuous transitions of user's affective states. The approach was tested on experimental data in which physiological measures were recorded on players involved in an action game to characterize various gaming experiences. We show that, in addition to exploitation of the results to characterize users' affective states through typicality degrees, this approach is a systematic way to automatically define fuzzy rules from experimental data for an affective agent to be used in real-time continuous assessment of user's affective states.

Key words: Machine learning, fuzzy logic, prototypes, typicality degrees, affective computing, physiological signals.