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E-BABE- acquisition and conditioning of physiological signals for emotion recognition to detect personality traits

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The purpose of this research is to build an emotion recognition system for the identification of personality traits using physiological signals (Electrocardiogram (ECG), Galvanic Skin Response (GSR) and Electromyogram (EMG)) and videogames. In this work, we present the signal acquisition, processing and feature extraction system for three physiological signals (ECG, GSR, EMG) used to detect the level of arousal of an individual using Russell's model of affect as a reference. Some metrics were extracted from the physiological signals related to the activation of the sympathetic and parasympathetic autonomic nervous system. The system allows for the capture of the three signals, while the test subject is playing a videogame, which provides the emotional stimuli. Then, the three raw signals are conditioned and filtered to extract metrics, such as, Beats Per Minute (BPM), Heart Rate Variability (HRV), number of GSR peaks in the Skin Conductance Response (SCR) and forearm contraction time. To identify and describe the behavior of these four metrics with the arousal level from Russell's model of affect, a sequence alignment is implemented of the behavior of these metrics during a period in which the subject is in a state of relaxation and while playing the game.

Biography

Mauro Callejas Cuervo is a Systems Engineer and Doctor of Applied Science from the Antonio Nariño University. He holds a Master's degree in Computer Science from the Instituto Tecnológico de Monterrey, Mexico and PhD in Energy and Process Control from the University of Oviedo, Spain. Currently, he is an Associate Professor in the Faculty of Engineering and Director of the Research Group in Software at the Pedagogical and Technological University of Colombia. His research interests include projects of inertial and magnetic micro-sensors in tele-rehabilitation and development of active video games and intelligent systems. He was awarded the scientist medal for the year 2017, in the field of advanced materials science and technology by the international association of advanced materials.

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