Exploring standalone electrodermography for multiclass VR emotion prediction using KNN

ABSTRACT

The use of Electrodermography (EDG) in emotion classification is emerging in recent studies, however, it is still limited when compared to the use of other physiological signals such as Electroencephalography (EEG) and Electrocardiography (ECG). Galvanic Skin Response (GSR) or EDG can be used in studies relating to the psychophysiological of emotion. This paper presents the result of an experiment conducted using EDG as the main signal for emotion classification with the use of K-Nearest Neighbor (KNN) as the classifier. In the experiment, the EDG data is acquired from 10 subjects while Virtual Reality (VR) headset is used to view 360 degrees video. Python is used as the programming language for the emotion classification with KNN as the classifier to classify intra-subject (individual) and inter-subject (overall) data. The main objective of this paper is to present the result of the experiment when using KNN as the classifier rather than using Support Vector Machine (SVM) which is synonymous with machine learning. The data were then classified into four classes of distinct emotion, inter-subject achieved an accuracy of 54%, while intra-subject classifications, two subjects achieved an accuracy of 96.9%. This result shows that KNN can provide good accuracy for emotion classification using machine learning as an alternative to SVM.