

## **Support vector machine tuning for improving four-quadrant emotion prediction in Virtual Reality (VR) using wearable Electrodermography (EDG)**

### **ABSTRACT**

Electrodermography (EDG) / Galvanic Skin Response (GSR) indicates the psychophysiological of emotion, EDG is an emerging signal used in the field of emotion classification aside from Electroencephalography (EEG) and Electrocardiography (ECG). The Empatica E4 wearable device was used in collecting EDG signals and employed as the method in capturing the test subject's physiological signal of their skin activity. This experiment had 10 participants that use a Virtual Reality (VR) headset for viewing video stimuli in 360 degrees while collecting the EDG signals. Python with Support Vector Machine (SVM) was used in processing the 10 subjects' data. This paper aims to compare the accuracy of the SVM experiments with different parameters, different settings based on the data retrieved from the wearable. The emotions were classified into four distinct quadrants with inter-subject classifications yielding an accuracy of 54.3%, and intra-subject classification yielded an accuracy of 57.1% to 99.2%. The presented results show that it is possible to achieve results with higher accuracy when parameter tuning. Hence, promising results were demonstrated for emotion prediction in four quadrants using wearable EDG technology in virtual reality environments. This paper provides two contributions, the use of EDG signals in emotion prediction, and the parameter setting to increase the accuracy for SVM classification.