Aesthetic preference recognition of 3D shapes using EEG

Abstract

Recognition and identification of aesthetic preference is indispensable in industrial design. Humans tend to pursue products with aesthetic values and make buying decisions based on their aesthetic preferences. The existence of neuromarketing is to understand consumer responses toward marketing stimuli by using imaging techniques and recognition of physiological parameters. Numerous studies have been done to understand the relationship between human, art and aesthetics. In this paper, we present a novel preference-based measurement of user aesthetics using electroencephalogram (EEG) signals for virtual 3D shapes with motion. The 3D shapes are designed to appear like bracelets, which is generated by using the Gielis superformula. EEG signals were collected by using a medical grade device, the B-Alert X10 from advance brain monitoring, with a sampling frequency of 256 Hz and resolution of 16 bits. The signals obtained when viewing 3D bracelet shapes were decomposed into alpha, beta, theta, gamma and delta rhythm by using time–frequency analysis, then classified into two classes, namely like and dislike by using support vector machines and K-nearest neighbors (KNN) classifiers respectively. Classification accuracy of up to 80 % was obtained by using KNN with the alpha, theta and delta rhythms as the features extracted from frontal channels, Fz, F3 and F4 to classify two classes, like and dislike.