**EEG-based classification of positive and negative affective states**

**Approach:-**

1. It assumes that more complex emotions are made up of finite array of basic emotions and thereby focuses on a discrete set of basic emotional constructs such as fear, anger, sadness, happiness or surprise.

2) It uses a two dimensional scale based on valence and arousal.

They have used second approach.

**Dataset:-**

1. Two types of videos were shown,first inducing the positive effect by showing ‘America’s Funniest Home Videos’ and second inducing negative effect by showing ‘Saving Private Ryan’.
2. The participants watched a 19min video narrative built around the archetypal themes of fairness and justice, situated in a contemporary and cross-culturally applicable context.

**Data recording and signal processing:-**

1. 20 referential EEG-channels located according to International 10-20 international system.
2. The sharp notch filters were applied to remove environmental artifact interference from the power network.
3. The proprietary acquisition software also included artifact detection algorithms in the time-domain EEG signal, such as spikes, amplifier saturation or excursion that occur during the onset or recovery of saturations
4. Eye blinks were identified and decontaminated by an algorithms based on wavelet transformation.
5. The decontaminated EEG signals was transformed from the time-domain to frequency domain for further data analysis by applying FFT.

**Data Analysis:-**

1. The most discriminative variables were selected from the training set (dataset1) by utilizing variable selection procedure in **SAS software package**: stepwise discriminant analysis.
2. In each step, a set of F-tests was performed as the selection criteria to determine the explanatory power of variables and to select which variables to include and which to exclude from the model.
3. Two different classification approaches were applied: linear Discriminant Function Analysis(lDFA) and quadratic Discriminative Function Analysis(qDFA).

**Results:-**

1. qDFA classifiers achieved higher specificity and PPV than lDFA, but sensitivity and NPV of lDFA were higher ;i.e., qDFA often misclassified positive class as negative and vice versa. lDFA misclassified negative class as positive more often.
2. However lDFA classification results were more stable and the overall accuracy of the lDGA classifier was higher.
3. The most predictive variables were from the gamma frequency band which shows that gamma band is suitable for EEG-based emotion classification.