Electroencephalogram (EEG) Based Emotion Detection

Abstract :- In recent years, the rapid advances in machine learning (ML) and information fusion has made human computer interaction possible. Machines/computers have the ability to understand, recognition and analysis the emotion. Human emotions can be recognized by different ways like facial expressions, speech, behavior (gesture/posture) or physiological signals. Human may conceal their real emotions involuntarily or deliberately because of that the first three methods can be ineffective. For emotion recognition physiological signals can be more reliable. Compared with peripheral neurophysiological signals, electroencephalogram (EEG) signals more sensitive to fluctuations of affective states in real time and it can provide useful features of emotional states. According to the standard pipeline for emotion recognition, we review different feature extraction (e.g., wavelet transform and nonlinear dynamics), feature reduction, and ML classifier design methods (e.g., k-nearest neighbor (KNN), naive Bayesian (NB), support vector machine (SVM) and random forest (RF)). Furthermore, the EEG rhythms that are highly correlated with emotions are analyzed and the correlation between different brain areas and emotions is discussed. Finally, we suggest several open problems and future research directions in this exciting and fast-growing area of AI.

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