

Signal Processing and Emotion detection using EEG signal Data

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1 Introduction

In this dynamic world of artificial intelligence, advancement in industrial automation along with robots and lifestyle is changing rapidly. One of these advances plays an important role in the field of brain computer interface (BCI). Among numerous research going in BCI emotion detection/classification has been trending rapidly, using heart rate, eye movement, brain signals etc. Using sensors like portable EEG machines, ECG machines, or even devices like phones and watches, people have been collecting data on emotions and recording and training various kind of machine learning algorithms to detect emotions. However, we can only detect emotions with sensory machines and pre-trained models to classify in human interactions, but less research has been done to recreate the brain signal depending on the detected signals.

2 Proposed Idea

Hence my research proposal is to use EEG data taken from various dataset and detect human emotion. There is dataset like dreamer or seed dataset where EEG and ECG signal values are collected through showing various subject's videos. This can be used to create required brain signals depending on the emotion detected from the ECG signals and depending on that tasks various actions can be conducted.

3 Motivation

The reason why I'm interested to work on these because when I was in class 10, I saw a animation movie named "Big Hero 6". There's a character named Hero who had a robot named Baymax developed by his brother which mainly detect human pain by their voice. So, after detecting pain Baymax he could take some basic steps and suggest some medicines or advise to recover. So, that inspired me to do something. I've already worked at BRACU Mongol Tori, a

next generation MARS Rover as well as also worked at BRACU Dichari project. So, working with Robots are more interesting to me. So, initially in my project I'll do emotion detection and for future work, if possible, I'll try to generate Brain signals and train it to the robots so that robot can response according to human emotions.

4 Contribution

Detecting human emotion can be used in various applications, specially in medical conditions, for example if a patient is suppressing a horror feelings or is a state of disabled communication, program may automatically take actions based on functions and emotion detected. Similarly, as shown in movies like "Big Hero 6", robots or machines could be given a basic electric signal from detected emotions.

5 Resources

1. <https://github.com/cepdnaclk/e16-4yp-Human-Animal-Emotion-Detection-Using-ECG-and-ML-Techniques>
2. <https://github.com/pritamqu/SSL-ECG>

References

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