BCI controlled rc car
BCI-Brain Computer Interface

Abstract:

A **brain–computer interface**(**BCI**), sometimes called a **mind-machine interface** (**MMI**),**direct neural interface**(**DNI**),**synthetic telepathy interface** (**STI**) or **brain–machine interface**(**BMI**), is a direct communication pathway between the brain and an external device. BCIs are often directed at assisting, augmenting, or repairing human cognitive or sensory-motor functions.

We are trying to implement bci and test it to move a car purely from thought.

Implementation:

1)We know that our brain consists of millions of neurons continuously firing out pulses of current during communication for carying out certain activities, Studies show that certain pulses do get out of the head but are heavily distorted and can be picked up by electrodes placed on scalp.

2)For our implementation we choose certain voluntary movements like moving righthand,left hand etc. which produce pulses only in certain localized areas of the head. We pick up these signals using electrodes soaked in moist saline solution to reduce the external noise. Then these signals are passed through an IC ADS1298 which cancels out the noise and amplifies the signal.Our strategy would be to pick up signals from all electrodes and find the signal with maximum amplitude and send the corresponding signal to the arduino mounted on the rc car.

Implementation steps:

1)Make the required shape of the headset in solidworks and 3d print it.

2)Design the circuit board with the IC ADS1298 mounted on it.

3)connect it to the EEGLAB in MATLAB to analyse the signal.

4)Setup the arduino mounted car.

5)finish up the interface of the arduino and MATLAB.

Timeline:

week1)Research for the exact places and number of electrodes required, buy electrodes, finish 3d printing the headset.

week2)design and test the ADS 1298 on the circuit board.

week3)Make the car and complete coding.

week4) Test and refine.

week5)Test and refine.

week6)Test and refine.

Components Required:

ADS 1298, Basic electric components, saline solution,EEGLAB,electrodes, arduino,basic car components

Cost estimate:

ADS1298 available sample at texas instruments inc. --free

other electric circuits.

total<4k

Learning:

Immense learning oppurtunity comprising solidworks,3dprinting, bio interaction, arduino, team work.

Future Developments:

Has a huge potential for paralyzed people if we make it cost effective.They can type using a software which would be easy to make if we can make a car.

Work done till now:

1)Read up the required and related stuff to satisfy ourselves that it IS possible.

2)Met up prof. Rohit Srivastava of BSBE department and he forwaded me to a guy Anurag Meena who has worked in this field.

3)Met up this guy last week and got some fundae as to info regarding the chips.

References:

1)http://computer.howstuffworks.com/brain-computer-interface.htm

2)http://www.ted.com/talks/tan_le_a_headset_that_reads_your_brainwaves?language=en
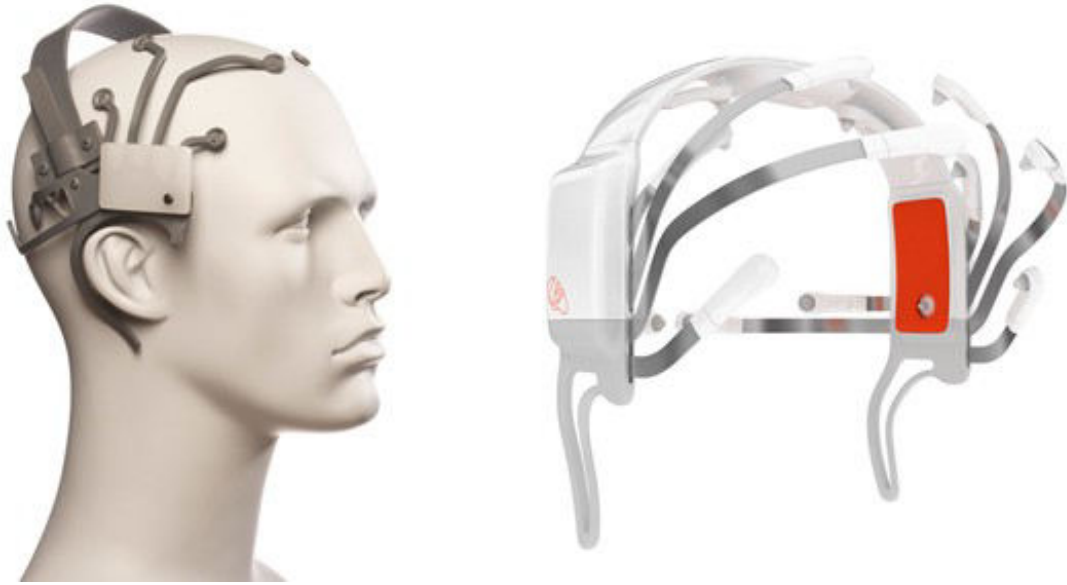
Thank You for reading through.

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