

Project Ideas

1. Post your BCI project proposal (a couple bullets/sentences) that you submitted on your CruX application or another if you do not want to use that one.
2. Once there's enough proposals on the document, write two or more short thoughts in bullet points about another project proposal. Could be ideas of how to implement, questions, or anything else (positive 😊)!
3. (Optional) If you want, post additional projects you may have in mind or links to other projects you found interesting.

-
- Analyze brain waves of people listening to different types of music to see where it affects them in the brain, to see the different brain waves that are expressed.
 - Test Categories: horror music movies, upbeat music, rap, pop, etc.
 - Survey participants following listening sessions to see if they liked the music and how the brain waves change if they like the music vs if they don't
 - The last bullet point is cool. What would you want the computer to do once it can recognize music taste?
 - An idea for how to expand upon this is maybe to see how all these different types of music affect performance of different tasks like studying, memory/recall, etc.

-
- Analyze brain waves of people who have insomnia while they're sleeping and compare their brain waves to those of people who don't have insomnia. This project could help people who have insomnia better fall asleep and help physicians figure out what are the characteristics of this sleep disorder.
 - Maybe we can also expand this idea to individuals who experience sleep paralysis
-

- Another idea I have is a self-driving car that you control with your brain. Since this is possibly dangerous, we can prototype it with a smaller toy car to see if the concept works. This could help people who are paralyzed be able to drive.
 - Nice idea! I like the medical applications! I think recording from the motor cortex would be a good idea since movements are planned there
 - An idea similar to this: self-controlled wheelchair that is controlled by the brain; also helping those who are paralyzed or those who lack motor control.

-
- Affective BCI aimed to detect emotions and modulate them by playing music (<https://iopscience.iop.org/article/10.1088/1741-2560/13/4/046022/meta>)
 - Give live updates of current emotion, try to reach target emotion through music
 - I like this idea, we could use the limitations/lessons learned from this study to guide the project or try to fill in holes that this study didn't address or completely diverge from it if we don't like how it was implemented

-
- A music based analysis project in which we analyze the brain waves from an EEG headset and see how subjects respond to certain kinds of music
 - Analyzing brain waves, patterns, and amplitudes using signal processing/machine learning will allow a certain output to occur if the brain wave surpasses a certain amplitude etc; the output being a change in the song in a playlist or something along those lines

Goals:

- The goal of this potential project would be to understand how the brain reacts to the stimulus of music and understand the recognition patterns using machine learning
- Curating a playlist unique to each subject

-
- BCI project aimed to take brain wave data and allow the user to control a robotic arm for various movements
 - Future applications would be to further develop the interface and robotic arm to potentially apply this software and hardware for neurally controlled prosthetic limbs