BLG111E-Introduction to Computer Engineering

Paper Evaluation

Title of the paper: Brain-Computer Interfaces: Beyond Medical Applications
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Brief summary of the paper

Brain-computer interface (BCI) is a system based on using brain waves rather than muscle movement as a control mechanism. BCI applications mostly focus on gaming and assisting people who cannot use a keyboard or mouse. And commercial products appears at those subjects. But it has some issues like usability, integration, standardization, ethical problems, that prevents BCI's development. There is lots of technologies to measure brain activity but most usable one is EEG. Even EEG requires several minutes to set up and a conductive gel is needed for quality signals. BCI has less speed than a regular input device however it can be used to assist users who must keep their hands on controls to operate equipment. BCI could be more useful than other types of hands-free controls. There is a lot of areas to apply non-medical BCI but it is only used in gaming for now. Impact of brain-based device control will be limited because of economic reasons and most of the research will be used in medical applications but research on high-end applications could yield commercial products for society. Besides that this technology's bandwidth and signal quality are very low which makes it impossible to use outside assistive technology. Anyway, BCI can be pretty useful for understanding user's state in future interfaces. Another usages for this technology are measuring people's reaction to a product or technology, developing automated training systems, gaming and entertainment, increasing brain capacity, detecting deviant behavior and suspicious objects. But there is still challenges to handle like; long calibration times, comfort of the device, noisy sensors, compatibility and making BCIs continuous.

Comments related to the paper

I think that using brain waves to communicate with something very unusual and unnatural but very useful. Something that unusual of course will require that much research and development which makes this technology very expensive. Instead of focusing on brain waves, focusing on micro muscle movements will be cheaper and faster. For example: Stephen Hawking's computer uses micro movements on a muscle in his cheek (Rowley and SwiftKey, 2014). Anyway, I think that BCI is perfect for medical applications but it is too hard to commercialize. It can be included in other technologies to understand human behavior but it requires a lot of research to use besides assisting.

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