

IS 282: Systems Analysis and Design

Final Project

Folder Document: Technological infrastructure required

Brain Wave Signal (EEG) of NeuroSky, Inc.

<http://www.neurosky.com/Documents/Document.pdf?DocumentID=77eee738-c25c-4d63-b278-1035cfa1de92>

Thinking Cap: “Mynd” Is the First Dry, iPhone-Compatible, Portable Brain Scanner

<http://www.fastcompany.com/1741403/mynd-neuromarketing-ipad-iphone-neurofocus-brain-scan>

Toward Exploiting EEG Input in a Reading Tutor

<http://www.neurosky.com/Documents/Document.pdf?DocumentID=e9ecc93c-9d47-b52b-127b-3f76dd639178>

The monitoring of brain activity as a form of self-tracking has become possible due to devices such as NeuroFocus’s “Mynd”, NeuroSky’s “MindWave”, and the Zeo Sleep Manager. These devices allow EEG signals to be read with dry electrodes and fixed wiring which reduces disruptive noise, important to the weak EEG signals. Devices like the MindWave, cost \$99 with the Education Bundle, which allows “research grade EEG” with a lightweight, wireless, and 10 hour battery life headset. Communication between the headset and computer is accomplished through a wireless USB plug-in because portability is an important function. The Mynd claims to get “full-brain coverage with dense-array EEG” sensors which can network with any Bluetooth enabled device, including mobile devices. Devices measuring brain activity seek to be easy to use, non-invasive, and mobile. There is also a large amount of information for creating your own EEG, making it even more accessible for personal use.

An important consideration for our design is the massive amount of data that will be collected and how it will be processed. FFT (Fast Fourier Transform) is the the mathematical process used in EEG analysis to investigate the composition of an EEG signal. While a programming environment such as Matlab could be used to process this data, the code to process the large amount of raw data efficiently and effectively will require dedicated programmers and research. This could be accomplished by recruiting a company to back the project and provide the resources necessary to get code written to process the data.

In order for the data to be fully utilized, a cloud computing system would shift the workload to servers and data storage systems, while providing access via the front end interface software. This would allow the devices to securely upload raw data to remote servers and a cloud computing system to process the data. Students, professors, and administrative staff would be able to access this information through personalized brain activity pages, similar to those utilized by social networking sites. With this information available on remote servers the data could be shared through universities to create a stronger understanding of the meaning of the data. This database of information would be an important factor for evaluation in the university.