NORTH AMERICAN UNIVERSITY

INSPIRATION INNOVATION GLOBAL COMPETENCE

SOFTWARE ANALYSIS & DESIGN COURSE PROJECT APPROVAL FORM

1.0 STUDENT INFORMATION

Geraldo Braho — Fall 2016

Student's Name — Term/Academic Year

2.0 CATEGORY CHARACTERIZATION

Indicate which category characterizes your Senior Design project:

X

_____ Independent Research and Senior Design Report

_____ Project Team Research and Senior Design Report

List team members _____and _____

3.0 DESCRIPTION OF PROPOSED PROJECT

Project Title: Brain Computer Interface

Brief Description of Project:
Brain computer interface technology represents a highly growing field of research with application systems. Its contributions in medical fields range from prevention to neuronal rehabilitation for serious injuries. Mind reading and remote communication have their unique fingerprint in numerous fields such as educational, self-regulation, production, marketing, security as well as games and entertainment. It creates a mutual understanding between users and the surrounding systems.
Brain-computer Interfaces (BCI) are devices that can record electrical signals from the brain and translate these signals into outputs to control an external device. The external device might be a small machine, such as a robot, or small computer program. Unlike other technologies that use brain electrodes, BCIs do not involve brain stimulation. They have been developed to record natural brain activity. Mind-control is a term used in the popular press to refer to these BCI technologies.

What are some medical applications of BCI?

There is a lot of potential for BCIs to help people with disabilities, although the work is experimental at this point. One of the most exciting possible applications for BCIs is to improve function in people who have been paralyzed or have diseases affecting the motor system. Steven Hawking, the famous astrophysicist who has ALS, is already participating in an industry-run trial to try out BCI. In ALS or in other conditions that disrupt brain-muscle connections, BCIs can record brain signals as someone attempts to move, and use those signals to stimulate muscles or move a robotic limb. BCI devices could also potentially produce speech for patients who have language losses. Speech or motor devices

could be used by therapists to augment rehabilitation, or for patients to "take home" to improve their daily function. BCI technologies have other clinical applications such as remote monitoring of brain electrical activity (EEG), which might be useful for patients with seizures or sleep apnea.

Are all the applications medical?

No, BCI devices are also being explored for military applications and for some high-tech games. Many of the games being sold as mind-reading devices, however, may be using muscle signals rather than brain signals. One example of a military application of BCI is to use a device to pick up small "alarm" brain waves produced when any of us views something that feels wrong. The BCI device can amplify these signals and alert the user faster than their brain would. In other words, there is potential to make healthy brains even better.