The New Wave
("Biometric Access & Neural Control")

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1. INTRODUCTION

I am sure that no one would disagree that the Internet has impacted most every aspect of our lives and the way in which we live our lives. Indeed, the Internet is a technological tool of supreme magnificence that has enriched our lives and is accessible to anyone who desires the Internet, but is the Internet truly accessible to anyone? There are many individuals with disabilities that have not had the opportunity to explore the boundlessness of the Internet. However, in the very near future that will all change, just as the wheelchair has allowed for increase mobility, so will the unveiling of ingenious emerging technologies, like Brain-Computer Interface (BCI), Human-Computer Interface (HCI), and Electrocenphlogram Interface (EEGI), NHCI (Neural Human-Computer Interface) and NI (Neural Interface). Nonetheless, from this point I believe a more accurate description of this type of interface technology, would be a NWAI (Neural Waveform Analysis Interface). Even so, as with all technology a coherent, easy to apply, and infallible security protocol will be needed.

2. MELDING OF TWO PROMISING TECHNOLOGIES

It is my belief that Biometrics and a NWAI, may perhaps be two of the most promising and life altering technologies in existence today. The implementation of these technologies could launch the world into a new era. An era where the phrase mind over matter has a corporeal meaning and physical disabilities will be redefined.

Furthermore, it is my opinion that a Biometric Access and NWAI Control solution will evolve in three-phases. The first will be oriented towards control of appliances (i.e. primarily navigating the Internet), the second will be mobility (i.e. automobiles, exoskeleton, etc.), and the third will be the implantation of bionic systems (i.e. cyborg).

3. THE MAGINOT LINE

One of the most consistent and prolific constraints towards the implementation of any new technology is the controversy over security and privacy of personnel data. In my opinion, opponents of new technologies, such as Biometrics or NWAI are absolutely necessary. Yes… They are a necessary part of the development and implementation process for any new technology. Why you might ask? My reply would be that no matter from where you hale antagonists of newly arisen technologies create a mind set that motivates a creator to improve designs, refine processes, and safeguard the things we hold most dear, our freedom and humanity.

I feel that the majority of civilization is compassionate and they recognize the supreme need for new assistive technologies. Therefore, both advocates and antagonists alike must do everything conceivable as civilized human beings to bestow freedom to everyone in need. To accomplish such a monumental task, we must harness the creativity and innovation of the society of the world to develop new theories and assistive technologies. I believe that the proceeding undiscovered biometric (EEG Fingerprint) is unique and in theory, can mutually satisfy or surpass the requirements of both the advocate and antagonist.

4. THE BIOMETRIC GRAIL

While conducting research for a previous paper titled "Let Me In!!!" which was published by the International Center for Disability Resources on the Internet (ICDRI) website in November of 2001 and later republished by The Next Interface at www.nextinterface.net in April 2002 my wife and I came across a website sponsored by EEG Spectrum (http://www.eegspectrum.com). This website is dedicated to a research project known as EEG Biofeedback. The mission of the EEG Biofeedback Project is to help people overcome mental disabilities, by teaching them how to alter or normalize a specific brainwave pattern (EEG Spectrum, 2001).

That is when it hit me; brainwaves are nothing more then patterns. If even one of the patterns were to be unique and unchanging, then I would have the perfect security protocol. So, I proceeded to contact EEG Spectrum in an effort to determine if such brainwave pattern existed and if so what is it. After many conversations EEG Spectrum had this to tell me, to which I will paraphrase. While it is true that a person has the ability to alter most of their own brainwave patterns, they cannot alter what is referred to as their baseline brainwave pattern.

Therefore, a tentative conclusion would be that an individual's baseline brainwave pattern could feasibly meet the qualifications of a biometric and hence has the potential to be recognized as the newest biometric security solution. A solution we dubbed as an "EEG Fingerprint".
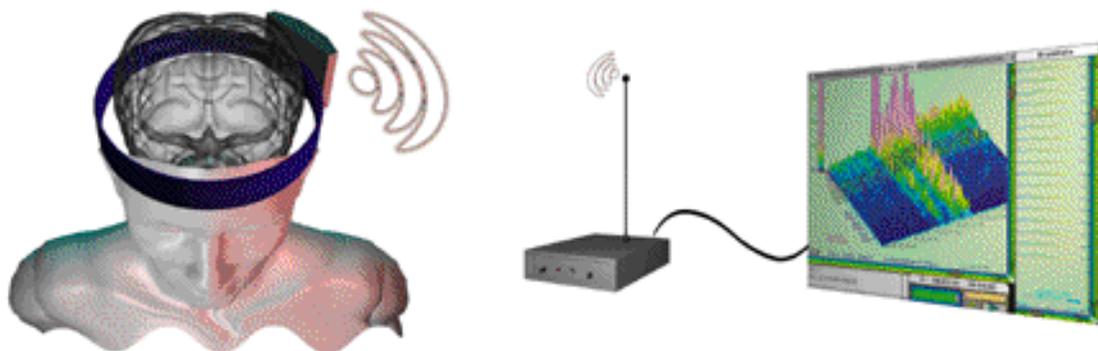

5. SO, WHAT IS BIOMETRICS AND HOW CAN IT HELP?

A biometric system is essentially a pattern recognition system that establishes a person's identity by comparing the binary code of a uniquely specific biological or physical characteristic to the binary code of a stored characteristic. This is accomplished by acquiring a live sample (the characteristic) from a petitioner (individual who is requesting access). The system then applies a complex and specialized algorithm to the live sample; it is then converted into a binary code. Once the live sample has been converted into a binary code, it is compared to the reference sample (previously stored binary code) to determine the petitioner's access or not. There are many biometric technologies & applications, for example:

>   Facial Geometry Verification, Facial Thermography Identification, Hand Geometry Recognition, Fingerprint Scan Identification, Palm Scan Identification, Back-of-the-Hand Scan Recognition, Knee Scan Recognition, Back-of-the-Knee Scan Recognition, Iris Scan Identification, Retina Scan Identification, Signature Verification, Voice Recognition, Ear Geometry Verification, Body Odor Recognition, Keystroke Entry Pattern Recognition, Vein Pattern Recognition, Breathing Pattern Verification, and Gait Pattern Recognition…Etc.

Think of biometrics as a key! Yes… A key, it can open doors for you and provides security to keep others out. It is a key that can be customized to an individual's access needs. You can use a biometric to access your home, your account, or to invoke a customized setting for any secure area/application.

6. WHAT IS NWAI AND HOW CAN IT HELP?

The neural waves emanate from a subject's brain in the form of brainwaves or bioelectrical impulses. To further iterate this I would like to call your attention to an article called "*Monkey Thoughts Control Computer*" published on the BBC News website (http://news.bbc.co.uk/hi/english/sci/tech/newsid_1871000/1871803.stm). This is not the first article or paper of this type, to promote NWAI. On the contrary there have been countless papers and articles released from multiple universities, colleges, and companies in an attempt to document their research. However, I just came across the most awesome, cutting edge, and the first website to commercialize the distribution of NWAI devices. You must check this out www.ibva.com!!!

Source: Image is from the IBVA Technologies, Inc website (http://www.ibva.com)

So, given the evidence, the answer is Yes! We can use biology's logic of self-preservation to merge the electronic and biological worlds. Essentially, NWAI is a device that senses and analyzes persons' neural waves and then interfaces with a computer to allow us to navigate (control) with brainwaves; NWAI would be analogous to a human hand. The problem is that the technology must be customized for each user and is therefore not easily adaptive to each individual.

5. WHERE ARE WE GOING

The absolute potential is most definitely inconceivable.   The employment of such technologies could shift cultural paradigm structures on our planet and eventually our universe. Theoretically, this technology has the potential to shatter virtually all disability barriers and could be viewed as a technology assisted psychic phenomena. Nevertheless, there is still several years of research to be completed before such a solution can transcend our being, in spite of that it is my persuasion that a Biometric Access and Neural Control Solution will evolve in three-phases. The first will be oriented towards control of appliances (i.e. primarily the Internet), the second will be mobility (i.e. automobiles, exoskeleton, etc.), and the third will be bionic systems (i.e. cyborg or golem). In either case I will continue to explore.

I would like to close with a quote from Stephen Hawking:

**'We must develop as quickly as possible technologies that make possible a direct connection between brain and computer, so that artificial brains contribute to human intelligence rather than opposing it.'
-- Stephen Hawking**

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(The International Center for Disability Resources on the Internet)

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