

Research Article

Desired Ambience of Mind, its Predicting and Restoring [DAMPAR]

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Abstract

Increasing brain performance will be boon to humanity and it has always been a desire to whole mankind to be happy and contented with what they possess but due to human psychology we hardly find someone who is happy with their life. Rather we find people with tensions, depressions, mentally unstable within their daily life. Apart from that many researches have carried on lie detection so far but none found to be fruitful. This paper is an innovative proposal and virtual thought on Predicting and Restoring the Desired Ambience of Mind. The proposal is about recording internal brain minute voltages of a person at jubilant conditions and restoring these voltages by applying external stimulus to the brain to desired condition. The Brain Centers & Afferent Nerves act as mediator for DAMPAR which can also be used for tracing liars.

Keywords: Brain-afferent nerves, external stimulus, voltages, predicting and restoring.

1. Introduction

Human brains have billions of neurons and brain centers which are stimulated whenever we do some task. As it operates it produces electrical signals which are low in amplitude (voltage) but considerable in amount. For every positive as well as negative response or decisions taken up by our brain these neurons and centers are triggered (K. Sembulingam *et al*, 2013) Now after collecting different samples of voltages conducted on different age groups and various situations we maintain a database.

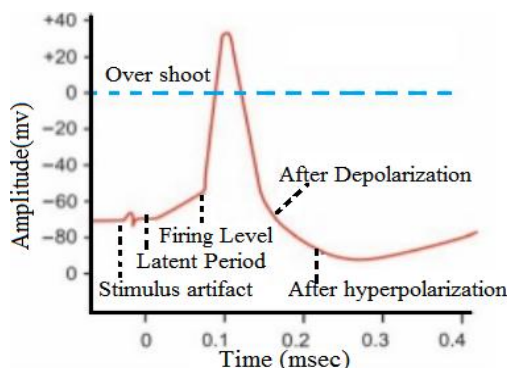


Figure 1: Action Potential in Nerve Fibre

The various situations and scenarios like happiness, fatigue, sadness, verity, cunning and then thoroughly recorded voltage values are normalized using weighted Euclidean distance. The main idea of this project is to supply the same recorded voltage externally to the brain and change his mood to the best possible scenario and lead

a stress-free and depression-less life as per his desire. The measured voltage recordings of different possible circumstances are made available to the person and he can freeze his particular reading as restore point, accordingly he can trigger the specific values and acquire impact of required ambience. The voltages in the nerves which are formed accordingly to specific task are projected below with contrast to muscle nerve (K. Sembulingam *et al*, 2013).

The rest of the paper describes detail procedures and possibilities of inventing this technology and possible solutions to various problems and other devices which are not expeditiously able to provide correct measure for human deception and depression.

2. DAMPAR Helmet

A. Description

The proposed method is at its infancy. It's an inception to an era of reign to the brain as per the desire.



Figure: 2 Reference Approach. Helmet for DAMPAR

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The BCI sometimes called a direct neural interface, synthetic telepathy interface or a brain-machine interface, is a direct communication pathway between the brain and an external device (M. Fernandes *et al*, 2009). The experiments conducted and which can yield the authentication are Left and Right index finger are also inserted in Pad button which is pressed across and respective stimuli are collected from stimuli system softer after conducting 20 trails. Obtained output was 85% accurate for right and 70% accurate for left. To avoid fatigue research is carried out at 360 ms (ms=0.001second) for 1500Hz auditory stimulus sound (Irina-Emilia Nicolae *et al*, 2013) Present BCI is accompanied by MEMS, submicron & Nano technology. But there is no realistic solution for some problems.

Fundamental problems

- i) Neural Implant communication to computer without wire communication.
- ii) Electrical energy must be provided to operate implanted system.

Solutions which can be possible are Battery operated BCI but which is inconvenient for patient & tissue damaged due to excess RF absorption and “colonize” – wireless communication metabolic energy to electrical energy. WBC is capable of electron transfer. It is possible to harvest energy from chemical process involving our body’s own resource to generate electricity within physiological environment (Mingui sun *et al*, 2006).

B. Action Potential

Action Potential in a nerve fibre is similar to that in a muscle, except for some minor differences like

Table 1: Electrical potential in Nerve versus Muscle Fibre

Event	Nerve Fibre	Skeletal muscle Fibre
Resting membrane potential	-70mV	-90mV
Firing Level	-55mV	-75mV
End of depolarization	+35mV	+55mV

C. Device Apparatus

The device through which we can predict and track these very low voltages should have mastered the stability criteria. Without the stability the prediction thus made will lead to barking up the wrong tree. The possible apparatus which we can find its significance for DAMPAR is wave Analyser. It can measure minute voltages and can also get hold on the waves ranging from 100 KHz to 15 GHz. experimentally this apparatus has excelled in its applications. Example of such kind of device is MSA-500 Micro System Analyzer.

D. Brain Waves

Brainwave profiles and the daily experiences of the world are inseparable. When brainwaves are out of equilibrium, there will be equivalent problems in the subject emotional and neuro physical health. Investigation has recognized brainwave paradigm accompanying with all sorts of emotional (recorded in electrical) and neurological circumstances. Based on these evaluations the project is mainly based.

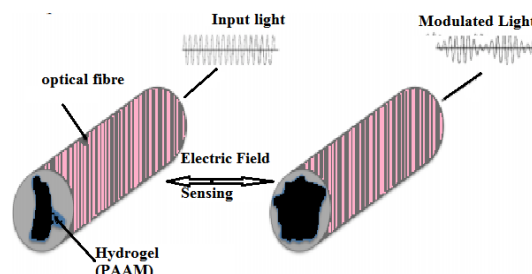


Figure: 3 PAAM sensors

The possible sensors which are best suited for our application are polyacrylamide hydrogel (PAAM).This polymeric material, besides being of low cost, allows for the easy modification of its physical and chemical properties (M. Bassil *et al*, 2008). When submitted to an external electric field, PAAM sensor undergoes a piercing or bending procedure, altering its mass and volume properties. In the same way the input light passes through the hydrogel will experience changes, not only regarding the refractive index, but also the amount of light that is diffused back to the photo detector.

3. Possibility and Its Analysis

A. Research carried out so far

Over the past couple of years, however, it's become increasingly clear that applying an electric current to the skull (head) discusses similar benefits.

In recent U.S. military researchers have had great success using "trans cranial direct current stimulation" (tDCS) — in which they hook you up to what's essentially a 9-volt battery and let the current flow through your brain skull. Subsequently, few years later of lab testing, researchers found that tDCS can more than twice the rate at which people learn a wide range of tasks, such as object recognition, speech recognition, increase IQ; math's solving skills and weapon expert like shooting targets.

Although world don't yet have a commercially available "thinking cap," but we will soon [9], as we got the MAGIC ELECTRIC THINCKING CAP. So the research community has begun to ask: What are the ethics of battery-operated cognitive enhancement? Many will counter this as discrimination between rich and poor but in fact this can be considered as a boon to humanity. Where the depressed and dump people can lead a happy and desired life.

After trying it one can have different questions. To explain how it feels, it will have a near-spiritual association. When a neuroscientist named Michael

Weisend put the electrodes on a patient, what defined the experience was not feeling smarter or learning faster but an out of the box experience that everything in his head finally shut up.

B. What can happen inside skull?

Promising theory is that the mild electrical shock may depolarize the neuronal membranes in the part of the brain associated with entity recognition, making the cells more excitable and responsive to stimulus. Like many other neuroscientists working with tDCS (Tom Bartlett *et al*, 2012; S. S. Shanbhag *et al*, 2013), The first time encounter with this helmet may not have a good impression but with due course the negative effects like tickling will vanish and we can see a drastic exponential positive result in the patients.

Alternate choice is that the electrodes somehow diminish activity in the prefrontal cortex — the area of the brain used in critical thought, it sounds counterintuitive, but silencing self-critical thoughts might allow more automatic processes to take hold, which would in turn produce that unproblematic feeling of flow.

Another alternative method which is being adopted uses anode at right side of the skull and cathode at left side. Minor voltages were supplied from right to left for max 45 minutes and in another context they were abounded from left to right. Result illustrates anode to cathode flowing electric charge has great impact on the memory improvement of the subject.

With the electrodes on, patient's constant self-criticism virtually will disappear, when patients are introduced in a gaming environment where they are supposed to grasp the content in the display and trace the target in game ON mode. Person with electrical stimulus hit almost every one of the targets, than without the helmet. The best part was there were no unpleasant side effects or negative effects. The bewitching silence of the tDCS stays, gradually diminishing over a period of about three days to six days depending on the immunity system of the patient. It is a good sign that these electric shocks are equivalent to day to day potential which is produced around us. Scientists have found that "trans cranial direct current stimulation" can acquire more than double the rate at which people learn a wide range of tasks, such as object recognition, math solving ability, and marksmanship. With this positive hope now we can extend same on normal people to record their brain voltages and reproduce them at desiring conditions.

C. Neural stimulation

Neural stimulation is also now a day's communal method of pain therapy. Stimulus generators with yields of 0 to 10 volts (or zero to several milli-amperes of current are used) are emblematic. A variety of waveforms and pulse trains in the "physiologic" frequency ranges of 0 to about 350 Hertz is also typical. This output is delivered to electrodes placed near or in neural tissue on a temporary basis (acute electrode placement) or permanent basis (chronic electrode embeds). Such stimulation can relieve ache, modify neural function, and treat disorders. Typically, the

stimulation is sustained to have enduring effect, i.e., usually when the stimulus is turned off, pain will return or resurrect to the therapeutic neural modification will cease after a short time (hours or days). Thus permanent implant electrodes and stimulators (battery or induction driven) is standard practice. With this in mind we can produce a temporary helmet for normal people to avoid Narco Test and also provide lull to the discomfort patient.

D. Electro Encephalo Graphy

EEG is the recording of electrical activity along the scalp. EEG measures voltage instabilities resulting from ionic current drift within the neurons of the brain. In clinical contexts, EEG refers to the recording of the brain's spontaneous electrical commotion over a short period of time, usually 20–40 minutes, which is recorded from multiple electrodes placed on the scalp. Diagnostic applications generally focus on the spectral content of EEG, that is, the type of neural oscillations that can be seen in EEG footage. The human brain operates along a spectrum from 1 Hertz up to as much as 100 Hz, although most commonly is record up to about 40 Hz. Brain wave frequencies are clustered into four basic categories associated with diverse mental functions and named with letters of the Greek alphabet.

The first is Delta, from 1 Hz to 4 Hz, is linked with sleep. The second is Theta, from 4 Hz to 8 Hz, is associated with hypnogogic and hypnopompic states (states between sleep and (wakefulness). Third is Alpha, from 8 Hz to 13 Hz, is associated with a deeply relaxed, yet waking state. (Hironori Ohkadol *et al*, 2004) and fourth is Beta, from 13 Hz to 40 Hz, is the frequency range in which we operate in our day-to-day waking state. Amplitude and frequency are important for brain waves at particular moment and EEG (J. Katona *et al*, 2014) which records this intern helps us for DAMPAR.

E. Polygraph Test

Lie detectors is well familiar with police investigations, and sometimes a person applying for a job will have to undergo a polygraph test (for example, certain government jobs with the FBI or CIA require polygraph tests). The goal of a lie detector is to see if the person is telling the truth or lying when answering certain questions.

When a candidate takes a polygraph test, four to six sensors are attached to him. A polygraph is a mechanism in which the multiple ("poly") motions from the sensors are recorded on a single strip of moving paper ("graph"). The sensors usually record:

- i. The person's blood pressure
- ii. The person's pulse
- iii. The person's breathing rate
- iv. The person's perspiration

At times a polygraph will also record things like arm and leg movement. When the polygraph test starts, the questioner asks three or four simple questions to establish the norms for the person's signals. Then the real queries being tested by the polygraph are asked. Throughout

questioning, all of the person's signals are recorded on the moving paper.

Both during and after the test, a polygraph examiner can look at the graphs and can see whether the vital signs changed significantly on any of the queries. In general, a significant change indicates that the person is telling lies. The results apply only to specific events and not to screening.

F. Detecting deception

Some research links lying with such facial and bodily cues as increased pupil size and lip pressing but not with blinking or posture.

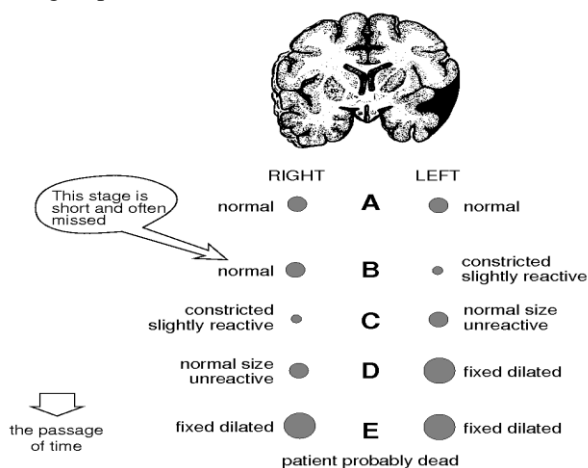


Figure 4: Pupil Reaction in CEREBELLAM

The human brain is an amazing marriage of electricity and chemistry. Neurons are microscopic power sources that build up an electrical charge by chemical means then briefly reverse the voltage over and over again. Electrical potentials can shoot along the neuron’s major extension—the axon—and be translated into chemicals that cross the synapse, the tiny gap amid neurons, to produce electrical potentials in the getting dendrites of the next neuron. In that neuron, the process can begin again, so that the electrical potential can keep moving. Neurons fire these action potentials in harmony to achieve whatever tasks the brain are doing. Charging and discharging it determines the frequency of the cortical rhythms in the brain. The cortical rhythm is the sum of the brain’s action and dendrite potentials.

Fluctuations in the brain’s electrical voltage are not just impulsive or reflex, nor are they necessarily driven by an external sensory source or stimulus can be externally supplied in mild rates to process accordingly; these fluctuations can also be deliberately self-generated. Scientists used to believe that autonomic responses such as the heart rate or brain-wave generation were beyond our conscious control.

Joseph Kamiya, a psychologist at the University of Chicago, performed the first experiment launching that brain waves could be operantly habituated. In fact, he found it surprisingly simple to clarify people to recognize, and later reproduce, exact frequency (alpha) on command if it was pointed out to them when they generated it.

Scientists hypothesize that neuro feedback works by training people to achieve conscious control over their brains’ primary wave generator, the thalamus cortex. If they are rewarded with a tone or a light when they are producing a specific range of frequencies in a specific brain locale, people can learn to increase and decrease this activity with desire and determination.

Experiment practicing has proved astonishing results. Patient whole body, and some particularly tense muscles in my face and neck, relaxed, yet I felt alert, centered, and poised. My sleep improved. I experienced an unusual mental sharpness and clarity. Colors seemed more vibrant and rich. My rather compulsive personality style softened. Most unusual of all, it seemed that the scope of patient vision opened; when looked around, He took in more with less effort. This was important to what would come later.

Another concept (Synchrony) is the brain’s way of encouraging more voices in the choir, which helps important signals to stand out from the “noise.” Synchrony, sensitive in an alpha state, relates directly to amplitude and power. In the February 23, 2001, issue of the journal Science, two scientists at the National Institute of Mental Health, Robert Desimone and Pascal Fries, reported that synchronous neuronal firing may be a vital mechanism for enhancing the volume of brain signals that represent important stimuli. In effect, they said, synchrony is the brain’s way of encouraging more voices in the choir, which aids important signals to stand out from the “noise.”

Synchrony is necessary for optimal info processing in the brain, something animals understand unconsciously. While grooming and at rest like monkeys. When neuro-feedback situations the whole brain into synchrony, that synchrony transfers the brain cells and the physiological systems they administer toward homeostasis, or better, more flexible physiological regulation.

Conclusion

With the immense growth in this field of EEG and already conducted experiments by scientist now we can see a better future for the patients suffering from depression, OCD, intense anger and sadness. Techniques like Narco test and lie-detector can be removed by establishing DAMPAR which act as a bench mark and has vast usage in everyone’s life. Just record your happy moment using DAMPAR Helmet, select and apply it in demanding situations, in minutes you are back to a cheerful ending state.

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