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Neurolinker

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Abstract—The Neurolinker mindwave headset turns your computer into a brain activity monitor. The headset safely measures brainwave signals and monitors the attention levels of individuals as they interact with a variety of different apps. This headset is useful for OEMs and developers building apps for health and wellness, education and entertainment.

Index Terms—Neurolinker Future of AI

I. Introduction

The Neurolinker Gear, is a helmet that reads and sends information to the brain. It serves to read and transform into brain pulse commands within the virtual world and to send pulses to the brain in order to emulate sensation and perception. In the case, sending impulses is so advanced that the helmet can make the user to disconnect from the real world and feel literally inside a virtual world. In technical terms what the helmet sends are several images per second to the brain in order to emulate an environment (how many frames per second? I do not know, but no lag, then it's more than 24), this along with sensations of pain , cold, etc . All this while keeping the user in a semi-coma, unable to feel, hear, or move your body in the real world, also the result of sending electrical impulses to the brain.

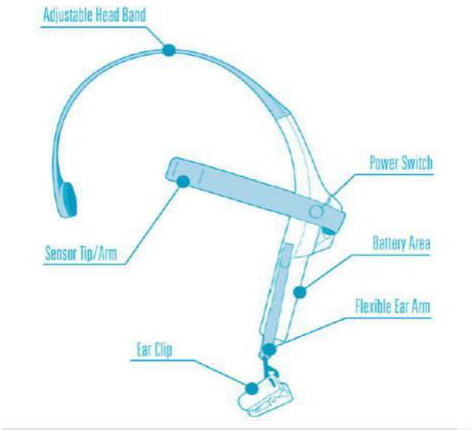

Fig. 1. Design of Neurolinker

Fig. 2. Prototype of Neurolinker

Fig. 3. Neurolinker interface with human brain

BRAIN

The brain is an amazing three-pound organ that controls all functions of the body, interprets information from the outside world, and embodies the essence of the mind and soul. Intelligence, creativity, emotion, and memory are a few of the many things governed by the brain. Protected within the skull, the brain is composed of the cerebrum, cerebellum, and brainstem.

The brain receives information through our five senses: sight, smell, touch, taste, and hearing - often many at one time. It assembles the messages in a way that has meaning for us, and can store that information in our memory. The brain controls our thoughts, memory and speech, movement of the arms and legs, and the function of many organs within our body. [1]

The brain is composed of the cerebrum, cerebellum, and brain stem (Fig. 1).

Fig. 4.

1. Cerebrum: is the largest part of the brain and is composed of right and left hemispheres. It performs higher functions like interpreting touch, vision and hearing, as well as speech, reasoning, emotions, learning, and fine control of movement.

2. Cerebellum: is located under the cerebrum. Its function is to coordinate muscle movements, maintain posture, and balance.

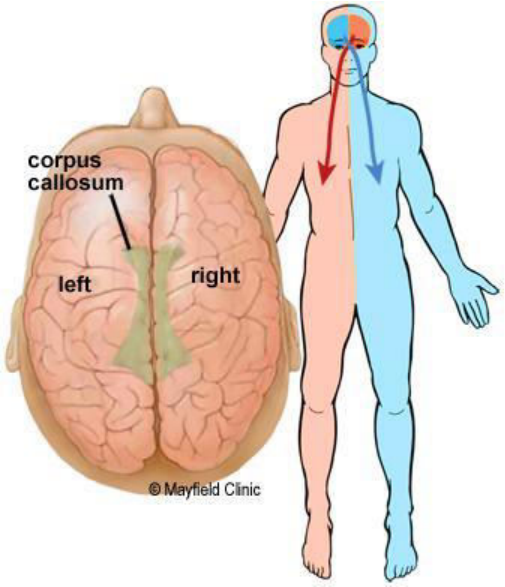

Fig. 5.

3. Brain stem: acts as a relay center connecting the cerebrum and cerebellum to the spinal cord. It performs many automatic functions such as breathing, heart rate, body temperature, wake and sleep cycles, digestion, sneezing, coughing, vomiting, and swallowing.

Nerve cells

There are many sizes and shapes of neurons, but all consist of a cell body, dendrites and an axon. The neuron conveys information through electrical and chemical signals. Try to picture electrical wiring in your home. An electrical circuit is

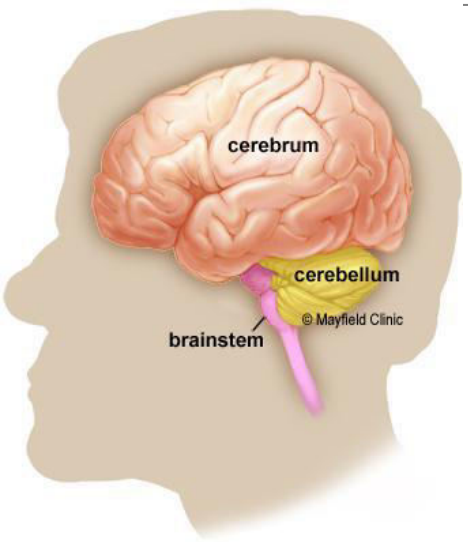

Fig. 6. The brain has three main parts: Figure 2. The cerebrum is divided into left and right the cerebrum, cerebellum and brainstem. hemispheres.The two sides are connected by the nerve fibers

made up of numerous wires connected in such a way that when a light switch is turned on, a light bulb will beam. A neuron that is excited will transmit its energy to neurons within its vicinity.

Neurons transmit their energy, or “talk”, to each other across a tiny gap called a synapse . A neuron has many arms called dendrites, which act like antennae picking up messages from other nerve cells. These messages are passed to the cell body, which determines if the message should be passed along. Important messages are passed to the end of the axon where sacs containing neurotransmitters open into the synapse. The neurotransmitter molecules cross the synapse and fit into special receptors on the receiving nerve cell, which stimulates that cell to pass on the message.

What are brainwaves?

The brain has billions of neurons, and each individual neuron connects (on average) to thousands of others. Com-munication happens between them through small electrical currents that travel along the neurons and throughout enormous networks of brain circuits. When all these neurons are activated they produce electrical pulses — visualize a wave rippling through the crowd at a sports arena — this synchronized electrical activity results in a “brainwave”. [2]

TABLE I
1. CHARACTERISTICS OF THE FIVE BASIC BRAIN WAVES

Frequency band	Fre-quency	Brain states
Gamma ( )	>35 Hz	Concentration
Beta ( )	12–35 Hz	Anxiety dominant, active, external attention, relaxed
Alpha ( )	8–12 Hz	Very relaxed, passive attention
Theta ( )	4–8 Hz	Deeply relaxed, inward focused
Delta ( )	0.5–4 Hz	Sleep

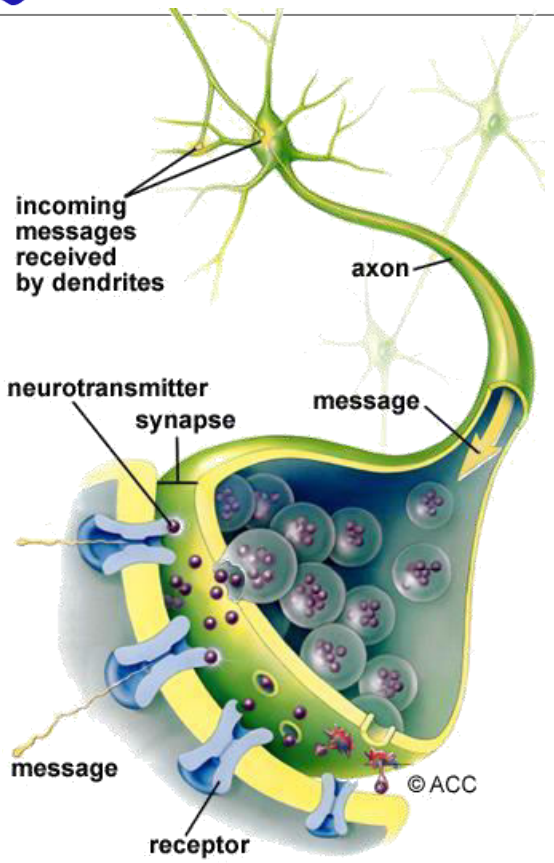

Fig. 7.

The neurolinker works on gamma ( ) and beta ( ) brain waves frequency band.

Which describe the brain states on the computer to simulate the object in real time.

One way that EEG 'brainwaves' convey information is in their rate of repetition. Some oscillations, measured on the scalp, occur at more than 30 cycles per second (and up to 100 cycles per second!) These cycles, also called frequencies, are measured as Hz, or hertz, after the scientist who proved the existence of electromagnetic waves.

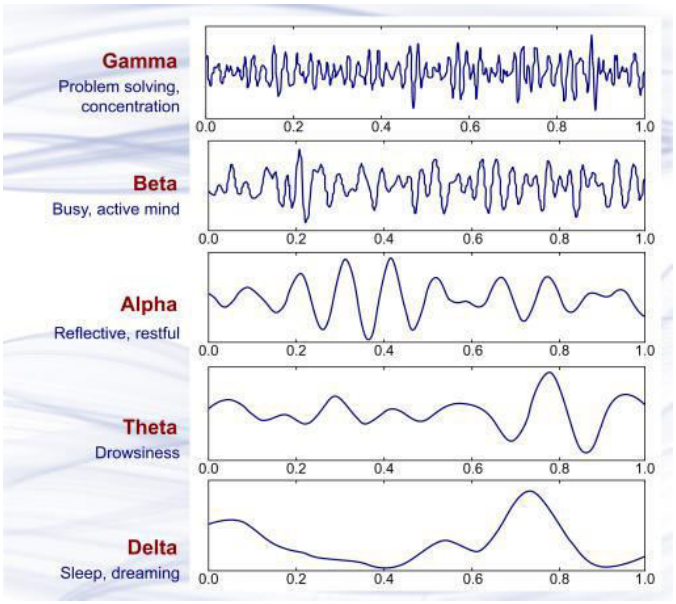

Fig. 8. Brain wave samples for different wave forms

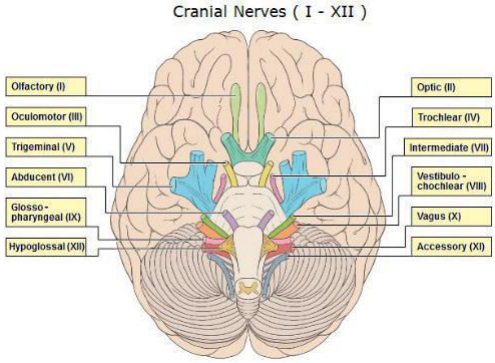

Fig. 9.

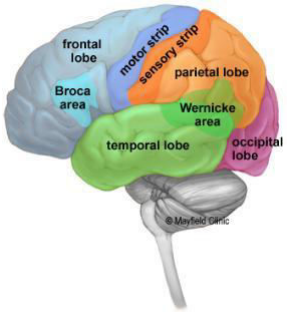

Fig. 10. The cerebrum is divided into four lobes: frontal, parietal, occipital and temporal.

II. RESULT

The long-term goal is to achieve "symbiosis with artificial intelligence", which Musk perceives as an existential threat to humanity if it goes unchecked. At the present time, some neuroprosthetics can interpret brain signals and allow disabled people to control their prosthetic arms and legs.

REFERENCES

[1] Google, “Brain fuction.”
[2] “Brain Waves.” [Online]. Available: www.sciencedirect.com