EMOTION ANALYTICS USING BRAIN SIGNAL BY NEURAL NETWORK

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Abstract— As we all know humans act to any situation according to their emotions. Primary emotions are six and all the emotions are the combinations of these 6 Emotions. So, these 2^6 emotions totally analyze the six basic emotions through the Brain wave. When neuron sends the impulse, it makes electric signal accordance to electromagnetic induction. The magnetic flux is taken and thus this value is feed to our neural network system. We also combine other inputs to the network with sensory emotions for base values and previous memory as base for accuracy in the machine learning to correct the value of weights. Thus we can predict the thought to certain extent and use for further analysis physiological mental disorders.

I. INTRODUCTION

The human brain is that the central organ of human system and with neural structure, makes up the central system .It controls most of the activities of the body like processing ,integrating, coordinating the information that is received from the sense organs and makes decisions which is sent as instructions to the body. In human brain, a typical neuron collects signals from others through a number of fine structures called dendrites. The neuron sends out spikes of electrical activity through a protracted, skinny stand known as nerve fibre that splits into thousands of branches.

At the tip of every branch, a structure a known as colligation converts the activity from the nerve fiber into electrical effects that inhibit or excite activity from the connected neurons. When a nerve cell receives excitant input that's sufficiently giant compared with its repressive input, it sends a spike of electrical activity down its axone. The systema nervosum is concerned in receiving info regarding the setting around US (sensation) and generating responses to it info. The nervous system can be divided into regions that are responsible for sensation and for the response. But there's a 3rd operate that must be enclosed. Sensory input must be integrated with alternative sensations, as well as with memories, emotional state, or learning. Some regions of the systema nervosum area unit are termed integration or association areas. The human brain has advanced over time in responding to survival instincts, harnessing intellectual curiosity, and managing the nature demands. When humans got associate glimmering regarding the dynamics of the setting, we have a tendency to begin our quest to duplicate nature.

Our success in imitating nature has been associated with advances in science and technology. While the human brain finds ways in which to exceed our physical capabilities, the mix of arithmetic, algorithms, machine ways, and applied mathematics models is fast our scientific pursuit. Today, Artificial intelligence has grown from data models for problem-solving to artificial neural networks — a computational model based on the structure and functions of human biological neural network.

The process of integration combines sensory perceptions and better psychological feature functions like reminiscences, learning, and feeling to supply a response. Learning happens by dynamical the effectiveness of the synapses in order that the influence of 1 nerve cell on another changes.We conduct these neural networks by first trying to deduce the essential option of neurons and their interconnections. It can interact other person in Malayalam. This artificial intelligence can take decision according to the feelings of the user. It stores the data which we received from the outside world and stores in the database and take data from database when needed. It recognizes the obstructions infront and accordingly actions are controlled. OLED displays are also being used. There are many various algorithms that tackle this issue. As a matter of truth, Reinforcement Learning is outlined by a particular kind of downside, and all its solutions are classed as Reinforcement Learning algorithms. In the downside, AN agent is meant decide the simplest action to pick out supported his current state. When this step is continual, the matter is understood as a mathematician call method. A reinforcement learning rule, or agent, learns by interacting with its environment. The agent receives rewards by performing arts properly and penalties for performing arts incorrectly. The agent learns while not intervention from a personality's by maximising its reward and minimizing its penalty.

generally program a pc to simulate these options. However as a result of our information of neurons is incomplete and our computing power is restricted, our models area unit essentially gross idealizations of real networks of neurons.

II.THEORETICAL BACKGROUND

A. REINFORCEMENT LEARNING

Reinforcement Learning is a type of Machine Learning, an thereby also a branch of Artificial Intelligence. It permits machines and software package agents to mechanically verify the perfect behavior among a particular context, in order to maximize its performance .Simple reward feedback is needed for the agent to be told its behavior; this is often referred to as the reinforcement signal. There are many various algorithms that tackle this issue. As a matter of truth, Reinforcement Learning is outlined by a particular kind of downside, and all its solutions are classed as Reinforcement Learning algorithms. In the downside, AN agent is meant decide the simplest action to pick out supported his current state. When this step is continual, the matter is understood as a mathematician call method. A reinforcement learning rule, or agent, learns by interacting with its environment. The agent receives rewards by performing arts properly and penalties for performing arts incorrectly. The agent learns while not intervention from a personality's by maximising its reward and minimizing its penalty.
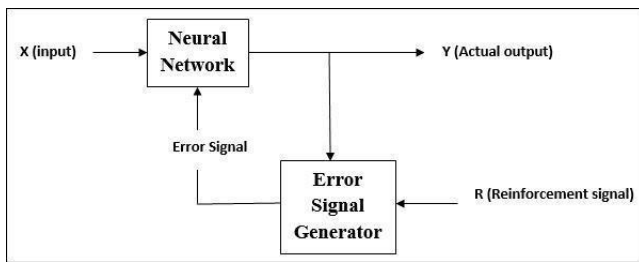

Fig 1.reinforcement learning

B. BACK PROPAGATION

Back propagation is a supervised learning algorithm, for training Multi-layer Perceptron (Artificial Neural Networks).The Back propagation algorithmic rule appearance

The weights that minimize the error perform is then thought-about to be an answer to the educational downside.

We try to urge the worth of weight specified the error becomes minimum. Basically, we want to work out whether or not we want to extend or decrease the burden price.

Once we all know that, we tend to persevere change the burden price therein direction till error becomes minimum. You might reach some extent, wherever if you extra update the burden, the error can increase. At that point you wish to prevent, which is your final weight price. Fig 2 depicts the layers of a back propagation network.

Limitation of the back propagation is there is no need of normalization of input vectors but normalization improves the performance.in back propagation it is not guaranteed to find the global minimum of the error function.

The number of nodes in an exceedingly hidden layer determines the 'expressive power' of the network. It is same that hidden layer nodes cause a neural web to suit the noise of the input.
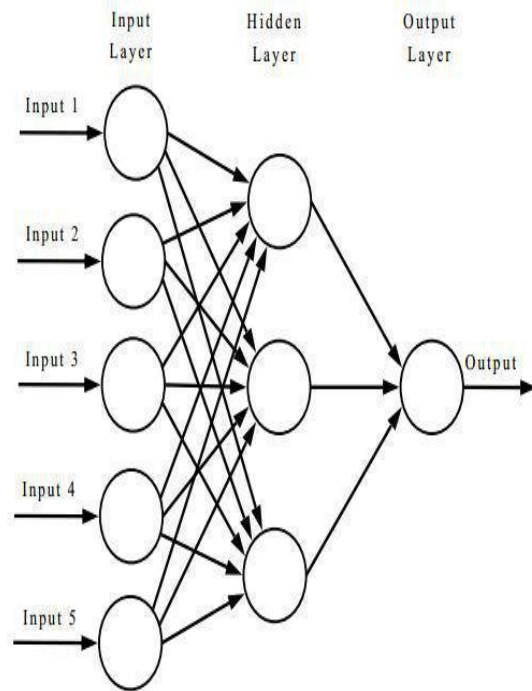

Fig 2. Back propagation network

III. EMOTION MAPPING

As we all know, emotions are complex. Psychologists say that we've solely vi basic emotions, that area unit happiness, anger, sadness, fear, surprise, and disgust. All of our different emotions area unit engineered from the vi basic emotions. For example, jealousy stems from a combined feeling of anger or disappointment.

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1. Happiness activates many areas of the brain, together with the correct frontal area. This activity involves connections between awareness (frontal cortex and insula) and therefore the "feeling center" (amygdala) of the brain.

2. Fear activates the hypothalamus and areas of the left frontal cortex. This involves some thinking (frontal cortex), a "gut" feeling (amygdala), and a way of urgency usually related to survival (the neural structure.)

3. Sadness is related to accrued activity of the correct lobe, the left insula, the left neural structure the amygdaloid nucleus and also the hippocampus. The hippocampus is powerfully connected with memory, and it is sensible that awareness of bound reminiscences is related to feeling unhappy.

Sadness has been studied quite the opposite emotions as a result of depression might last for a protracted time; the consequences of antidepressants are often measured supported improved symptoms.

4. Disgust is a remarkable feeling that's typically related to rejection. This feeling that's related to activation and connections between the left corpus amygdaloideum, the left inferior cortical area, and therefore the insular cortex.

5. Anger is a very important feeling that a lot of individuals, adults and kids alike, attempt to management. Anger is related to activation of the correct hippocampus, the corpus amygdaloideum, each side of the anterior cortex and therefore the insular cortex.

6. Surprise is associate feeling that may either cause you to feel sensible or it can cause you to feel dangerous. Surprise activates the bilateral inferior convolution and therefore the bilateral hippocampus. The hippocampus is powerfully related to memory, and therefore the part of surprise is, by nature, related to experiencing one thing that you just don't bear in mind or don't expect.

Localized illness within the brain will cause changes in emotions. Similarly, diffuse illness, like that seen in conditions like degenerative disorder and tiny vessel illness, also can induce changes in emotional standing, that area unit usually recognized clinically as changes a patients' personality.
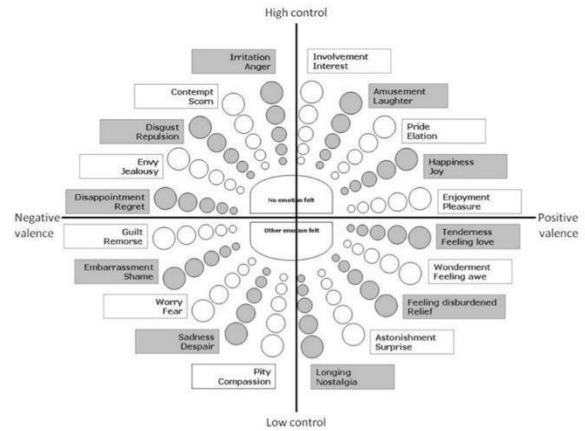

Fig 3. Emotions of human brain

There are completely different kinds of recollections and that they also are encoded within the brain in terribly different manners.

1) For instance, memory (like after you hold some numbers or Associate in nursing address in your mind) is incredibly completely different from LTM. One way within which memory is hold on is by keeping neural circuits that write in code the remembered things active. This may be seen because the physiological analogue of continuance mentally the things we would like to recollect. Working memory is incredibly slender and restricted and prone to interference.

2) Instead, semi-permanent reminiscences involve a lot of structural changes within the brain. These changes can come in many different forms. The more typical (and widely studied) is when the strength of the connections between two neurons - called synapses - changes. This physiological implementation of reminiscences provides Associate in nursing intuition of however they work. For example, imagine that a nerve cell that encodes an area, associate degreed another that encodes an feeling, area unit activated once a wrong expertise is felt at this explicit place. As a result of this expertise, these two neurons fire together and then wire together (this is known as Hebb's rule).Then, whenever the neurons of this explicit place are activated, the emotion is also retrieved

IV.DESIGN AND IMPLEMENTATION

The environment of implementation here is Opencv, PHP my admin, Cpanel, Pycharm, Arduino IDE.

The proposed AI system gets supported on different platforms and it can react to your instant chats on social media accounts .It will suggest better plan and action with accordance with its artificial intelligence. The system ensures RPA (Robotic Process Automation) with combination of Neural Networking &

Deep Learning. The result act as a basic of a detailed processed view of application can be described with the case diagram.
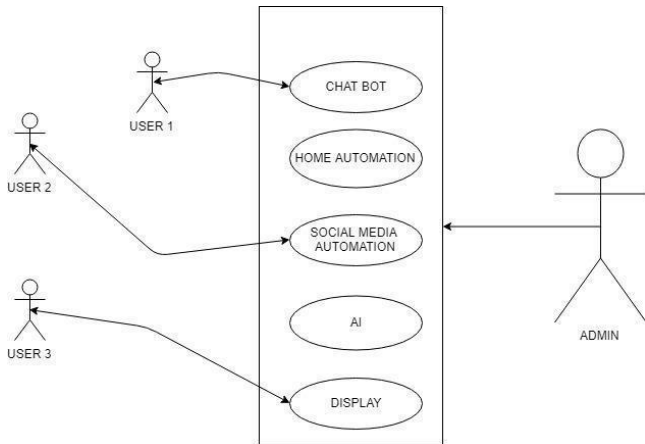

Fig 4. Use case diagram

The proposed system provides whatsapp, Facebook, Gmail and other social media connectivity. It gets supported on various platforms. The AI is fully structured in which the gestures can be controlled. Computer inputs devices are indifferent to human contact as there's no reaction from package within the event of creating, maintaining or breaking physical contact like touches or releases. Thus, bit sensing input devices offers varied prospects for novel interaction techniques. Therefore touch sensors are used to make the AI more efficient. With the help of ultrasonic sensor it can measure distance or sensing objects are required. We can sense any smell of gas using MQ2 gas sensor and gives us an alert. It can recognize voice and some of the gestures.Fig 5. Clearly depicts the sytem architecture of the proposed system.
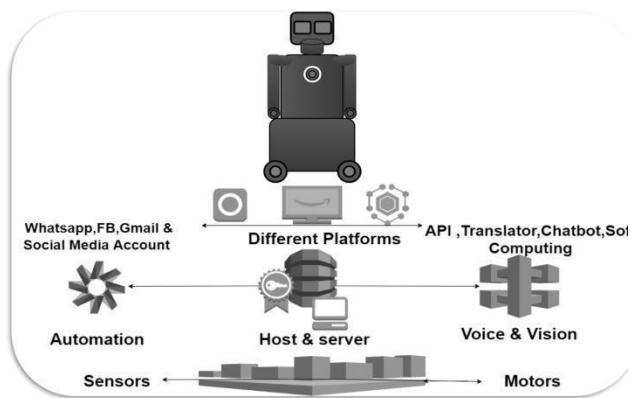

Fig 5. System architecture

It can interact other person in Malayalam. This artificial intelligence can take decision according to the feelings of the user. It stores the data which we received from the outside world and stores in the database and take data from database when needed. It recognizes the obstructions infront and accordingly actions are controlled. OLED displays are also being used.

V.CONCLUSIONS

This AI is supported on different platforms and it can react to your instant chats on social media accounts. It will suggest better plan and action in accordance with its artificial intelligence. It moves in all directions and easy to interact. It also helps us during our daily chaos and act as personnel assistance. Let us assume if we are climbing a mountain. Assuming that the mountain prime is that the "highest" purpose of the mountain, we think that the steepest path leads us to the top most efficiently. We approach this challenge by iteratively "feeling" around you and taking a step into the direction of the steepest ascent -- let's call it "gradient ascent." however what do we do if we tend to reach a degree wherever we will not ascent any further? i.e., each direction leads downwards? At now, we may have already reached the mountain's top, but we could just have reached a smaller plateau ... we don't know. Essentially, this is just an analogy of gradient ascent optimization (basically the counterpart of minimizing a cost function via gradient descent). However, this can be not specific to back propagation however only 1 thanks to minimize a lenticular value operate (if there's solely a world minima) or non-convex value operate (Which has native minima just like the "plateaus" that allow U.S. suppose we tend to reached the mountain's top). It helps the trauma stage patients to recover back to their life. It is also helpful for cancer treatments as the mind strength of the patient can be weighted and he can overcome the disease. We hope this concept will be useful for the present and future generation.
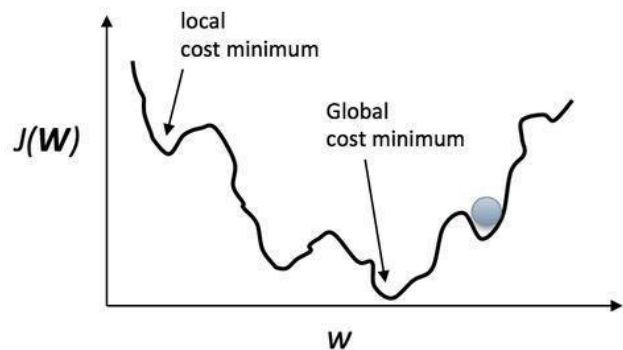
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parties involved, especially the reviewers for their feedback and suggestions.

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