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Brain Controlled Robot for Indian Armed Force

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ABSTRACT

Currently border security that incorporates social, cultural, activity and structure aspects of interactions among border security forces, smugglers and therefore the population and represent integrated technology architectures created of mounted and mobile detector and police work networks. These tools give important capabilities that influence border security operations, planning, analysis and coaching. Sensors are being deployed to enhance border security generating monumental collections of knowledge and databases. Sadly, these sensors will reply to a range of stimuli, typically reacting to important events and typically triggered by random events that are thought of false alarms. The intent of this project is to supplement human intelligence in a very detector network framework which will assist in filtering and period of time higher cognitive process from the massive volume of knowledge generated. In our project, the projected system that has secured to the motherland by victimization ideas of Wireless Integrated Network Sensors, GPS pursuit and object and metal detection and tracking of vehicles with within the country. By Object identification system we will be ready to get the images of that exact space wherever the strangers has returned in addition, because the details of objects or folks that are gift there. And later the metal police work sensors and bomb noticed signals can detect the existence of explosives and weapons(metals) with them. Presently the Indian government is coming up with to-implement a similar technology for pursuit the vehicles with within the country that carry illegitimate commodities (like government issued sugar , rice to be distributed among lots however send to alternative states without legal permission). The vehicles that carry explosive materials for industrial functions are often half-tracked.

Keywords: Brain Controlled Robot, GPS, GSM, EMD, ICA, EOG, LSS

I. INTRODUCTION

Now a day's border security that incorporates social, cultural, behavioral and structure aspects of interactions among border security forces, smugglers and therefore the population and represent integrated technology architectures created from fastened and mobile device and police work networks. These tools give important capabilities that influence border security operations, planning, analysis and coaching. Sensors are being deployed to boost border security generating huge collections of information and databases. Sadly, these sensors will answer a spread of stimuli, typically reacting to meaning events and typically triggered by random events that are thought of false alarms. The intent of this project is to supplement human intelligence in an exceedingly device network framework which will assist in filtering and period deciding from the massive volume of information generated. In our project, projected system that has secured to the motherland by victimization ideas of Wireless Integrated Network Sensors, GPS chase and object and metal detection and tracking of vehicles with within the country. By Object identification system we will be able to get the images of that individual space wherever the strangers has returned in addition because the details of objects or those that are gift there. And later the metal detector sensors and bomb finding signals can detect the existence of explosives and weapons (metals) within them. Presently the Indian government is racing to implement this technology for chasing the vehicles with within the country that carry

illegal commodities (like government issued sugar , rice to be distributed among plenty however send to different states without legal permission). The vehicles that carry explosive materials for industrial functions will be caterpillar-tracked. An embedded system may be a special-purpose automatic data processing system designed to perform one or a number of dedicated functions, often with period computing constraints. The typically embedded as a part of an entire device together with hardware and mechanical parts. In distinction, a all-purpose PC, like a private PC, will do many various tasks relying on programming. Embedded systems became important nowadays as they management several of the common devices we tend to use. Since the embedded system is devoted to specific tasks, style engineers will optimize it, reducing the dimensions and value of the merchandise, or increasing the reliability and performance. Some embedded systems are factory-made, profiting from economies of scale. Physically, embedded systems vary from transportable devices like digital watches and MP3 players, to giant stationary installations like traffic lights, manufactory controllers, or the systems dominant atomic energy plants. Quality varies from low, with one microcontroller chip, to terribly high with multiple units, peripherals and networks mounted within an outsized chassis or enclosure.

II. METHODS AND MATERIAL

A. Existing System

In the existing system, Bomb detection automobile is enforced victimization wired communication and it's not used any GSM technology to transmit the message to a different person's. Ancient explosive detection systems square measures bulkier in size, expensive, and continuously need manual attention. as a result of its public visibility entrant will simply bypass the system victimization another route. Detector network consists of many kinds of autonomous sensors to coordinately monitor a specific activity. The system consists of a processor, a detector and wireless transceiver instrumentality. The system collects the detector knowledge, perform native process and transmit the desired info to the safety officers. It is not reliable to the activity. B. projected System A new watching and management capability for watching the borders of the country. Victimization this idea we are able to simply establish an alien or some terrorist getting into the border. It's terribly cheaper in comparison to different security systems like measuring system below use. It produces a less quantity of delay. Thus it is fairly quicker. On a world scale, WINS can allow watching of land, water, and air resources for environmental watching. On a national scale, transportation systems, and borders are monitored for potency, safety, and security. we are able to use the IR detector associate degrees PIR detection of the human within a border , transmittal the situation victimization GSM technology. Any biometric identification system consists of 4 primary modules; knowledge acquisition, pre-processing, feature extraction and classifier module. The enforced algorithms for these modules square measure delineated during this section.

Knowledge Acquisition

The neurosky mind wave device is employed for police investigation the EOG signals from the brain. The receiver consists of associate degree ear-clip and a detector arm as shown in Fig. 2(a). This receiver is truly used for recording EEG signals; but, it may be want to live EOG signals because the arm detector is resting on the forehead on top of the left eye (Fp1 position). The reference conductor is on the ear clip (A1 position). The detector of Neurosky receiver is formed of dry conductor that doesn't need any skin preparation or semiconducting pastes and is well moveable and simple to wear. So, it takes but ten seconds to wear the receiver and begin recording signals. Also, the receiver is wireless that makes it appropriate for sensible implementation of biometric identification systems.

B. Pre-Processing Stage

The pre-processing stage concerned EOG isolation from EEG signals and eye blinks extracted from the isolated EOG signal. the foremost vital techniques for EOG isolation from EEG square measure freelance part Analysis (ICA) and Empirical Mode Decomposition (EMD) . EMD was applied to isolation task. The raw EEG signal was rotten into Intrinsic Mode Functions (IMFs) victimization EMD. The neuro signals square measure extracted from the anode of the mind wave device and square measure amplified and sent to the electronic device.

C. **Feature Extraction Stage**

The goal of feature extraction is to seek out a metamorphosis that converts the first signal into a comparatively low dimensional feature house that's able to preserve the discriminative info of every subject. Four teams of options (G1, G2, G3, and G4) were extracted supported time delineation of the attention blinking undulation. The signals square measure extracted by the MATLAB code and square measure than sent to the wireless module.

III. RESULT AND DISCUSSION

A. Implementation

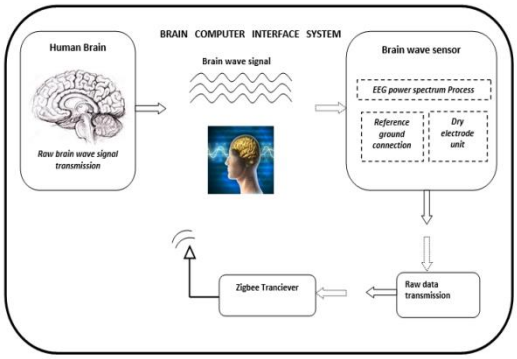

Figure 1. Brain wave sensor-Transmitter

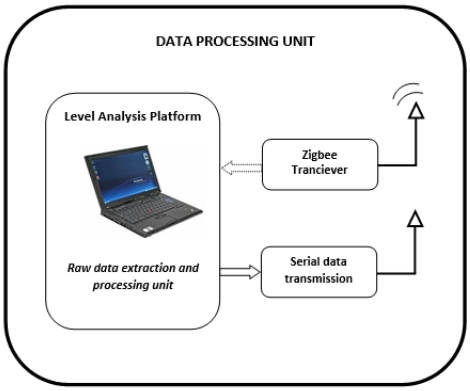

Figure 2. Brain wave sensor- Receiver

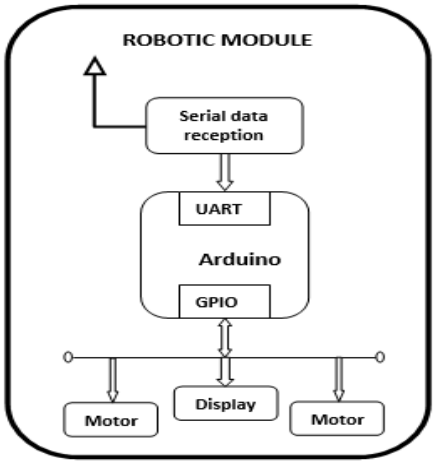

Figure 3. Robotic Module

Functional Description

Now a days border security that incorporates social, cultural, activity and structure aspects of interactions among border security forces, smugglers and also the population and represent integrated technology architectures created from fastened and mobile sensing element and police work networks. These tools offer vital capabilities that influence border security operations, planning, analysis and coaching. Sensors are being deployed to enhance border security generating huge collections of information and databases. Sadly, these sensors will answer a spread of stimuli, generally reacting to important events and generally triggered by random events that are thought of false alarms. The intent of this project is to supplement human intelligence in a very sensing element network framework which will assist in filtering and time period higher cognitive process from the massive volume of information generated. To control the automaton, graphical record and Eye-Blinking signals are required. Here this report describes graphical record and Eye-Blinking signals through a BCI interface. During this system we've got a bent to use, easy unipolar conductors to record graphical record signal from the forehead to construct a Brain-Computer Interface (BCI) primarily controls electrical automaton through Bluetooth for defense purpose. we've got got 2 signals like meditation and a spotlight. additionally, we have a tendency to conjointly extract the eye-blinking signals from BCI. Therefore, attention and eye-blinking signals are collected because the management signals through a Bluetooth interface and

so the electrically interface in automatically. The experimental results confirmed that this technique can supply a convenient manner to regulate the defense automaton. Depends upon brain wave signal from our brain, the automaton can operate. The emotional level of the signal is frequently observed and transmitted to the PC via electronic devices. Through frequency the signal is transmitted to the electronic device. The emotional level of the signal is modified by our activities. we've got to repair the direction of the automaton depends on the emotional level. NeuroSky Mind wave device forwards brain wave signals to the software system application. This data can then want to train a system. It will learn to acknowledge and therefore map totally different brain patterns in action and also the system can endlessly analyze the incoming brainwaves and map them into the acceptable actions. The signals from the brain are sent to the portable computer via an electronic device and are processed by the simulation software system and also the signals are then transferred to the automaton wirelessly via a Zigbee module. The signals are than received by the Zigbee receiver. The Arduino controller than processes the signal and also the individual action is meted out. the information received from the sensors(PIR, IR, BOMB detector) are taken severally by the Arduino and sent to the portable computer once more via the Zigbee module.

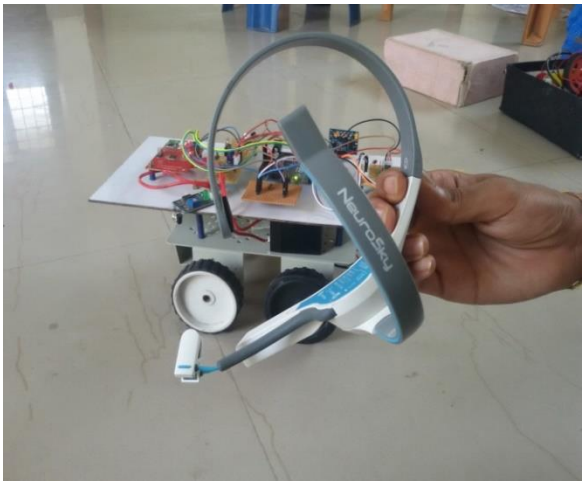

Figure 4. Brain wave device module

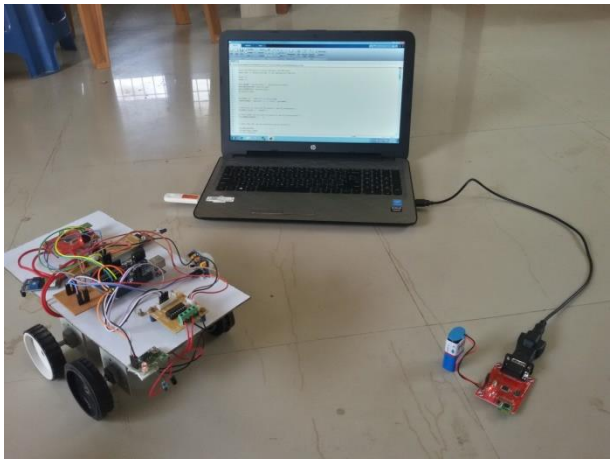

Figure 5. Complete assembled robot module

IV. RESULT AND DISCUSSION

The principle of operation is sort of easy. 2 dry sensors, square measure won't to find and filter the encephalogram signals. The device tip detects electrical signals from the forehead of the brain. At identical time, the device picks up close noise generated by human muscle, computers, light-weight bulbs, electrical sockets and alternative electrical devices. The second device, ear clip, may be a ground and reference, that permits suppose Gear chip to strain the electrical noise. The device measures the raw signal, power spectrum (alpha, beta, delta, gamma, theta), attention level, mediation level and blink detection. The raw encephalogram knowledge received at a rate of 512 Hertz. Alternative measured values square measure created each second. Therefore, raw encephalogram knowledge may be a main supply of data on encephalogram signals victimization Mind Wave MW001. Within the golem section we are able to browse the worth of raw encephalogram signal with the most frequency of 512 Hertz. Oftenest is ready on 512 Hertz, and that our management time delays in sampling. The worth of the signal and time square measure written to the array knowledge. The info that square measure keep in an array are compared to the edge points given by the user. During this project, the MATLAB section waits for 3 consecutive blinks so as to send the golem activation signal. Then supported the eye level worth golem Move Forward Command are send to the golem module through Zigbee transmission. Once 3 consecutive blinks, the program can scan for a left blink and right blink to show the golem right and left severally. The sensors gift within the golem i.e. PIR, IR and bomb detector

unendingly delivers the info to the Arduino. the info is then transmitted to the laptop computer via the Zigbee module. All the sensors work unendingly and transmits the info with none delay.

V. CONCLUSION

The brain-controlled mobile robots have a good deal of attention as a result of they'll facilitate bringing quality back to individuals with devastating fascicle disorders and therefore improve their quality of life. A comprehensive of the brain controlled mobile automaton, uses a brain wave device which may collect electroencephalogram based mostly brain signals of various frequencies and amplitude and it'll convert these signals into packets and transmit through Wireless medium into the amount splitter section to examine the eye level. Level splitter section (LSS) analyses the amount and provides the automaton movement for the one who is sitting within the wheel chair. the most important distinction between brain-controlled mobile robots and alternative brain-controlled devices is that these mobile robots need higher safety as a result of they're want to transport disabled individuals. The brain-controlled mobile robots are often applied in apply, together with finding ways in which to enhance the performance (especially robustness) of BCI systems, to enhance the driving performance given the constraints of the BCI system.

VI. REFERENCES

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