# SECURITY BASED ALTERNATIVE APPROACHES FOR CONTROLLING ACCESS TO CRITICAL INFROMATION IN WIRELESS SENSOR NETWORK

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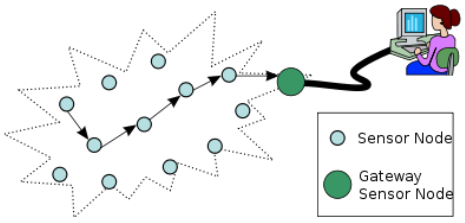
***Abstract*- Wireless sensor networks are spatially distributed autonomous sensors to monitor physical or environmental conditions, such as temperature, sound, pressure, etc. and to cooperatively pass their data through the network to a main location. Wireless sensor network (WSN) technology is one of the key research areas in computer science. In the healthcare domain, WSN can be used to monitor the human body and to control and access the critical information from the coma patient's brain. This paper describes how WSN can be used to monitor the coma brain and collect the vital data remotely from the brain. This paper also describes security for unauthorized access for the sensed data. Finally, this paper helps to identify the reaction of the coma patient's brain and to monitor the function of coma brain and to predict what they need.**

***Index Terms*- WSN, coma patient's brain, healthcare, Security based WSN**

## I. INTRODUCTION

**Wireless Sensor Network: -** [1][3]WSN is a group of specialized transducers with a communications infrastructure that uses radio to monitor and record physical or environmental conditions. A wireless sensor network is a group of specialized transducers with a communications infrastructure for monitoring and recording conditions at diverse locations. Commonly monitored parameters are temperature, humidity, pressure, wind direction and speed, illumination intensity, vibration intensity, sound intensity, power-line voltage, chemical concentrations, pollutant levels and vital body functions. A sensor network consists of multiple detection stations called sensor nodes, each of which is small, lightweight and portable.




Every sensor node is equipped with a transducer, microcomputer, transceiver and power source. The transducer generates electrical signals based on sensed physical effects and phenomena. The microcomputer processes and stores the sensor output. The transceiver receives commands from a central computer and transmits data to that computer. The power for each sensor node is derived from a battery. Potential applications of sensor networks include:

- Industrial automation
- Automated and smart homes
- Video surveillance
- Traffic monitoring
- Medical device monitoring
- Monitoring of weather conditions

## II. RELATED WORK

In[1] author used to explain about how the wireless sensor works in personal area network and also how can we use the sensors in personally. [2] Author said about the health of the human body is monitored via the sensor and that can stored. From this concept, I introduce my concept that is monitoring the human brain at the time of coma. [3] Author explain the monitored data are stored and also send to the authorized user with the wireless network, from this I used to send the data via the wireless

network and transferred to the prescriber (authorized user).

## III. BRAIN STAGES

**Coma: -** [2] Someone who is in a coma has minimal brain activity. They're alive, but can't move or be woken. Their potential for recovery will depend on the cause of the coma. A person in a coma will often be unresponsive to their environment. They may not be able to hear voices or feel pain. However, they may have some awareness of their surroundings. Every coma experience is unique.

Occasionally, a person in a coma may open their eyes, grimace or make a noise. They may not be aware of these movements or have any control over them. Being in a coma means the person has a low level of consciousness. Their level of consciousness will depend on how much of their brain is functioning, which may change over time.

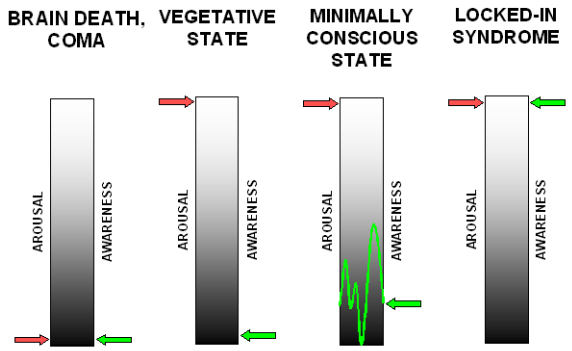
For example, initially a person may be in a very deep coma, where they're unresponsive to pain, before gradually recovering to a lighter coma, where they respond to pain. They may continue improving and eventually may become aware of their surroundings and begin to communicate.

The ability to make a clearly conscious response to external instructions indicates that the person is no longer in a coma.

Normal brain waves are in four stages they are

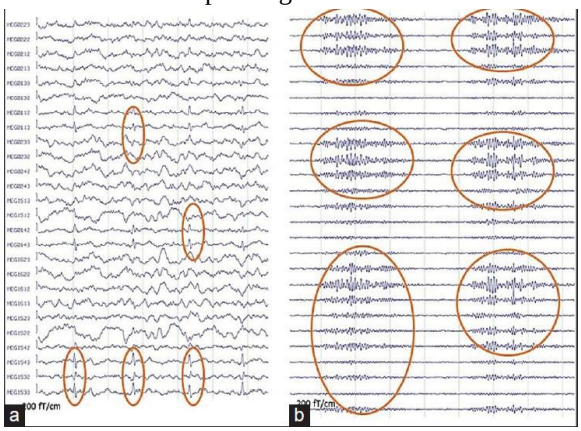
Alpha waves, Beta waves, Theta wave and Delta waves that monitor using Electroencephalography (EEG).

[2]**Vegetative state** is absence of responsiveness and awareness due to overwhelming dysfunction of the cerebral hemispheres, with sufficient sparing of the diencephalon and brain stem to preserve autonomic and motor reflexes and sleep-wake cycles. Patients may have complex reflexes, including eye movements, yawning, and involuntary movements to noxious stimuli, but show no awareness of self or environment. **A minimally conscious state,** unlike a vegetative state, is characterized by some evidence of awareness of self and/or the environment, and patients tend to improve. Diagnosis is clinical. Treatment is mainly supportive. Prognosis for patients with persistent deficits is typically bleak



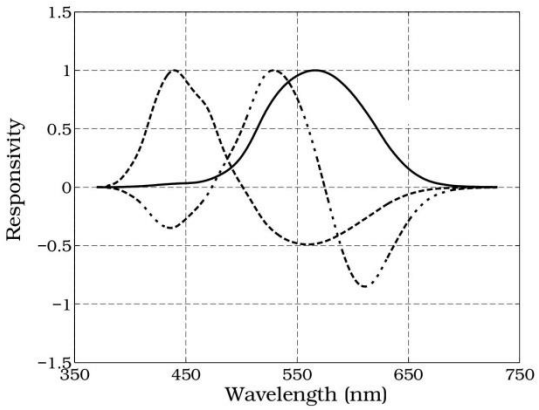

## IV. MONITORING OF COMA BRAIN USING WIRELESS SENSOR NETWORK

When one brain reached the coma stage that particular person can't able to access his body, this called the unconscious state. After this we need to monitor the brain for some signals to cure from the coma stage but we can't predict when the signal is coming. For this only we introduce the concept wireless sensor network. This sensor monitors the Thalamus state. This Thalamus is wakeup ringer for human body. This sensor mainly monitors the thalamus state of patient. If small signal wave comes out form the thalamus, these networks transmit those waves to the corresponding Prescriber via network.

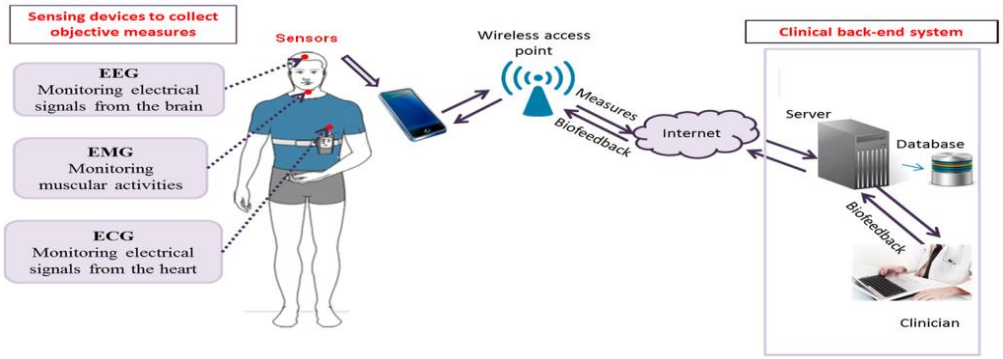



The above picture shows unexpected signals from the coma brain. These signals are transferred to the corresponding mapped network. These signals are transferred highly secured using the wireless sensor networks. This is the main purpose of this paper. Each and every signal from the brain is transferred without fails. This may help to treat a patient for corresponding injuries.

## V. SIMULATION RESULTS




The graphical image shows the responsive state of the coma brain. The dotted line show normal but not responsive state and the dark line shows the responsive state. This responsive state transferred to the coordinator device. Using this only can able to treat the patient.




The diagram shows the models of the process of this paper. The EEG monitoring the electrical signal from the brain and transmitting the signal waves via the wireless access point to the server and then physician get that alert from the clinical back end system.

## VI. CONCLUSION

Coma patient's brains are monitored and the electrical signals are recorded. The recorded signals transferred to the clinical backend server using Wireless Sensor Network, that accessed by prescriber. The treatment process send to the coordinator's device with the help of Wireless Sensor Network, this might helps to immediate remedy to the patient. Finally this paper helps to treat a coma patient immediately without delay. The data also secure from the unauthorized access using the wireless networks.

## REFERENCES

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BIOGRAPHY

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