**Epileptic Seizures Prediction Using Deep Learning Techniques**

**Abstract:**

Epilepsy is a very common neurological disease that has affected more than 65 million people worldwide. In more than 30 % of the cases, people affected by this disease cannot be cured with medicines or surgery. However, predicting a seizure before it actually occurs can help in its prevention; through therapeutic intervention. Studies have observed that abnormal activity inside the brain begins a few minutes before the start of a seizure, which is known as preictal state. Many researchers have tried to find a way for predicting this preictal state of a seizure but an effective prediction in terms of high sensitivity and specificity still remains a challenge. The current study, proposes a seizure prediction system that employs deep learning methods. This method includes preprocessing of scalp EEG signals, automated features extraction; using convolution neural network and classification with the support of vector machines. The proposed method has been applied on 24 subjects of scalp EEG dataset of CHBMIT resulting in successfully achieving an average sensitivity and specificity of 92.7% and 90.8% respectively.

Existing System:

Current efforts in epileptic seizure prediction using deep learning techniques involve the development of models that analyze electroencephalogram (EEG) data to detect patterns indicative of impending seizures. Researchers have explored various deep learning architectures, such as Recurrent Neural Networks (RNNs) and Long Short-Term Memory (LSTM) networks, to capture temporal dependencies in the EEG signals. Convolutional Neural Networks (CNNs) have also been employed for spatial feature extraction. These models are trained on labeled datasets, where EEG recordings are annotated with seizure and non-seizure segments. The performance of existing systems is evaluated based on metrics like sensitivity, specificity, accuracy, and the area under the ROC curve. However, challenges such as limited data availability and the variability of seizure patterns among individuals persist, necessitating ongoing research and refinement.

Proposed System:

The proposed epileptic seizure prediction system aims to address the limitations of existing models by incorporating advancements in deep learning and additional features for improved accuracy and reliability. Leveraging hybrid models that integrate information from multiple sources, including EEG data and other physiological signals, is a key component of the proposed system. This approach seeks to enhance the robustness of predictions and provide a more comprehensive understanding of the patient's condition. Additionally, efforts are directed towards developing models that can adapt to individual variations, considering the heterogeneity of seizure patterns across different patients. The proposed system places emphasis on thorough validation, ethical considerations, and compliance with regulatory standards to ensure safe and effective deployment in real-world clinical settings. Ongoing research and collaborative efforts between researchers and clinicians drive the evolution of the proposed system, aiming to significantly improve the quality of life for individuals living with epilepsy.

**HARDWARE & SOFTWARE REQUIREMENTS:**

**HARD REQUIRMENTS :**

* System    :   Pentium IV 2.4 GHz.
* Hard Disk  :   40 GB.
* Floppy Drive :   1.44 Mb.
* Monitor   :   15 VGA Colour.
* Mouse    :   Logitech.
* Ram    :   512 MB.

**SOFTWARE REQUIRMENTS :**

* Operating system   : Windows 8Professional.
* Coding Language  : python