Abstract

Epilepsy is a chronic neurological disorder which is characterized by recurrent and sudden seizures. People with epilepsy suffer from multiple types of seizures and Electroencephalography is an important clinical tool for diagnosing, monitoring and managing neurological disorders related to epilepsy. EEG signals are most often used to diagnose epilepsy, as seizures cause anomalies in EEG readings. In today’s world where adult life expectancy is rising and humans are living longer than ever before, the healthcare system generates vast amounts of data, including EEG signals. This paper examines the prospects and challenges faced in utilizing this data in order to optimize seizure detection in order to improve the patients’ quality of life. This paper also explores how Machine Learning can be applied to extract features and analyze the EEG signals and propose methods to achieve high classification accuracy.


New Learning Scheme of Feedforward Neural Networks”, Proceedings. 2004 IEEE International
Joint Conference on Neural Networks, 2004.
17. [ONLINE] Andrew L. Maas, Awni Y. Hannun, Andrew Y. Ng, “Rectifier Nonlinearities
Improve Neural Network Acoustic Models“, Computer Science Department, Stanford
University, CA 94305 USA -
18. Alexander Rosenberg Johansen, Jing Jin, Tomasz Maszczyk, Justin Dauwels, Sydney
S. Cash, M. Brandon Westover, "Epileptiform spike detection via convolutional neural
networks", IEEE International Conference on Acoustics, Speech and Signal Processing
(ICASSP), 2016.
for seizure detection”, International Joint Conference on Neural Networks (IJCNN), 2016.

Index Terms

Computer Science
Signal Processing

Keywords

EEG signal analysis, Epileptic Seizure Detection, Machine Learning, Feature Extraction,
Wavelet Transform, Signal Preprocessing, Signal Classification, Bidirectional Neural Networks,
Auto Regressive model, Approximate Entropy, Wavelet Packet Decomposition, Extreme
Learning Machines.