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Patent Search

Invention Title	I-NEURO: EFFICIENT IOMT BASED SEIZURE DETECTION BASED ON MACHINE LEARNING
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Abstract:

Epilepsy, which is characterized by recurrent spontaneous seizures, has a considerably negative impact on both the quality and the expectancy of life of the patient. Approximately 3.4 million individuals in the USA and up to 1% of the world population are afflicted by epilepsy. This necessitates the real-time detection of seizures which done by the use of an IoT framework for smart healthcare. In this paper we propose an EEG based seizure detection system in the IoT framework which uses the discrete transform (DWT), Hjorth parameters (HPs), statistical features, and a machine learning classifier. Seizure detection is done in two stages. In the first stage, EEG signals are decomposed by the DWT into sub-bands and features (activity, signal complexity and standard deviation) were extracted from each of these sub-bands. In the second stag deep neural network (DNN) classifier is used to classify the EEG data. The prototype of the proposed I-Neuro was implemented using the hardware-in-the-loop approach. results demonstrate a significant difference in HP values between interictal and ictal EEG with ictal EEG being less complex than interictal EEG. In this approach, we report accuracy of 100% for a classification of normal vs. ictal EEG and 98.6% for normal and interictal vs. ictal EEG.

Complete Specification

Ongoing technological advancements offer considerable opportunities for the
improvement of health care and reduction of cost, but also present a challenge for
the incorporation of new technologies into clinical care. A considerable amount
of research effort is currently focused on smart healthcare to overcome the
shortcomings of traditional healthcare and to meet the ever-increasing demands
for quality healthcare. Smart healthcare can be conceptualized as a combination
of sensors, devices, applications, services and entities including: traditional
healthcare, biosensors, wearable devices, information and communication
technology (ICT), and smart emergency response services. The backbone of
smart healthcare is the Internet of Medical Things (IoMT) or the Internet of
Healthcare Things (IoHT), a collection of medical devices and applications that
connect through the Internet to healthcare IT systems. The automated detection of
epileptic seizures is one example of smart healthcare. Epilepsy is a neurological
disorder characterized by recurrent spontaneous seizures. A seizure is a sudden
and transient interruption of brain function which may also be marked by

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