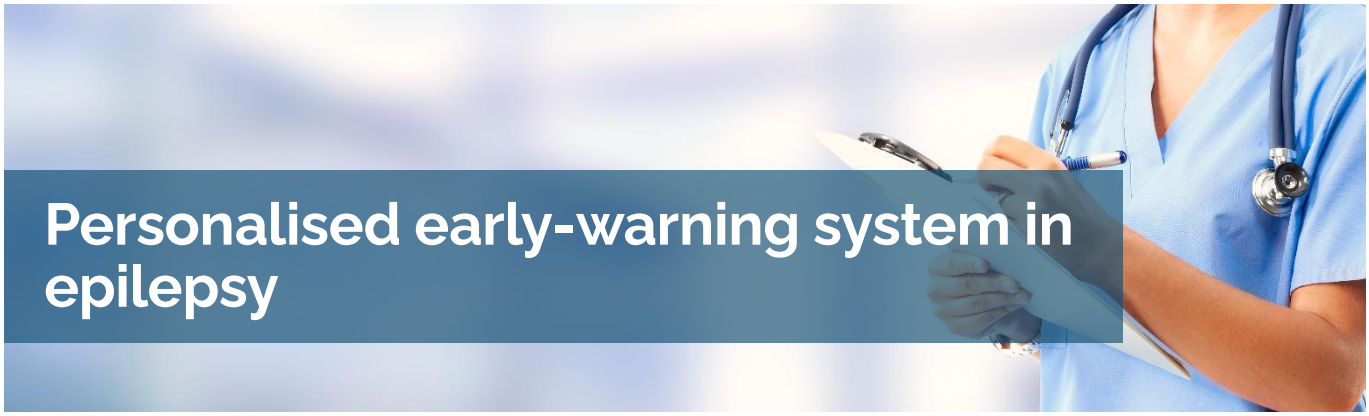
Prediction of epileptic seizures

DeepHealth

Epilepsy is the second most common serious neurological condition after migraine and affects 65 million people worldwide. The unexpected occurrence of seizures has serious impact on the life of patients and their families, who have to face a high risk of accidents and injuries. DeepHealth can provide new early-warning systems in epilepsy.



Personalised early-warning system in epilepsy

Challenge

The risk of sudden death in epileptic patients is up to three times higher compared to general population. The proper diagnosis and treatment of epilepsy can ensure a seizure-free life for up to 70% of people. Recently many studies have shown that non-invasive EEG signals can identify unusual patterns that could forecast the timing of next seizure attacks. An early-warning system that can timely predict the possible upcoming seizures will greatly benefit patients, their relatives and caregivers to take actions and avoid injuries caused by the incidents, while also research community will be benefited as they will be able to develop new methods to control or suppress the future seizure, i.e., electrical stimulation, etc.

Solution

As part of the DeepHealth project, the WINGS Health platform is used for the identification of potential upcoming seizures. Data from different sources such as open data repositories or other DBs, medical devices such as EEG wearables, sensors, etc. can be transmitted to the WINGS health platform where they are analysed. The system uses advanced machine learning on EEG signals to detect unusual patterns before the episode that may be associated with seizures. An interactive dashboard provides useful insights concerning the prediction of seizures to healthcare experts. As soon as an incident is detected, the system immediately notifies caregivers triggering an alarm. Healthcare experts have access to the raw signals coming from EEG and they can observe various information about the model's performance, as well as metrics which evaluate the model's prediction capabilities, like accuracy, sensitivity, specificity, precision, elapsed time of the model's inference.

Benefits

WINGS personalised early-warning system in epilepsy is considered a very helpful tool for the medical and research community as it can support the epilepsy management through useful insights that lead to better diagnosis and choices of treatment.

Medical specialty:
Neurology

Use Case:
Seizures Prediction

Sites:
Athens (Greece)

Entities:

WINGS ICT SOLUTIONS

DeepHealth Project

DeepHealth is a H2020 collaborative project which develops new HPC and Deep Learning techniques applied to large and complex biomedical datasets to support new and more efficient ways of diagnosis of diseases. The technologies developed (EDDLL, ECVL, etc.) have been validated by clinicians on 14 Use Cases like this, providing 14 Success Stories ready to scale to other healthcare institutions.

DeepHealth for seizures prediction.

Watch our Video.

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https://deephealth-project.eu/

DEEPHEALTH