

## **Transforming Epilepsy from a chronic condition towards an acute one using tinyML**

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Epilepsy is a neurological disorder in which brain activity becomes abnormal. This complex disease has >100 subclasses which all have one commonality: unprovoked, recurrent seizures. The number of seizures is the basis of any medical decision to prescribe or alter the drug for treatment and for approving drugs for their efficacy. Moreover, according to patient testimonies, the real burden of epilepsy comes from the unpredictable nature of seizure occurrences. This has a serious impact on the patients' quality of life: educational problems, limited employability, no driving license, societal stigma, restricted recreational choices (e.g. no/supervised swimming), ever-present fear and anxiety for another seizure, pregnancy complications, etc.

Currently, long-term patient follow-up and the low sensitivity of patient reported outcome (PRO) are very apparent in this disease area. The gold standard for patient diagnosis is video-EEG where patients need to be hospitalized for up to one week, while being connected to a full set of sensors. This procedure is resource-intensive, time-consuming and is not a guarantee for seizure detection (50% of patients do not experience seizures while hospitalized).

Byteflies aims to overcome these challenges by offering a unique, unobtrusive and wearable solution for the combined and non-invasive measurement of vital parameters needed for objective seizure logging and diagnosis of the different epileptic subclasses to improve the standard of care for Epilepsy patients. Moreover, the combination of this continuous daily monitoring solution and the online data analysis capabilities of tinyML enable objective assessment in epilepsy – including seizure prediction, the holy grail.