

## Flat Electroencephalography's cluster centers movement tracking during Epileptic Seizure

Syu'aiba Mukhni<sup>a</sup>, Tan Lit Ken<sup>a</sup>, Nor Azwadi Che Sidik<sup>a</sup>, Goh Chien Yong<sup>b</sup>, Lee Kee Quen<sup>a</sup>, Chuan Zun Liang<sup>c</sup>, and Yutaka Asako<sup>a</sup>

<sup>a</sup> Malaysia-Japan International Insititute of Technology, Universiti Teknologi Malaysia, Jalan Sultan Yahya Petra, 54100 Kuala Lumpur

<sup>b</sup> Xiamen University Malaysia, Jalan Sunsuria, Bandar Sunsuria, 43900 Sepang, Selangor.

<sup>c</sup> Universiti Malaysia Pahang, Lebuhraya Tun Razak, 26300 Gambang, Pahang.

### ABSTRACT

Epilepsy is a term used for a chronic disorder caused by excessive and abnormal nerve cell activity within the brain. This dynamic process is often associated with electroencephalography (EEG), which is an electrophysical method to record the electrical activity of the brain. For epilepsy patients, their EEG signals are characterized by abnormal signal flow and large spikes. This shows the excessive electrical activity within the brain can be extracted thus locating problematic cells of epilepsy is possible. However, it is very challenging due to the complexity of the signals to be analyzed. Through *fEEG*, the signals can be viewed in a Cartesian plane which consists of EEG's channels and cluster center of electrical potential during epilepsy. To date, no research has been done on across time-frame of *fEEG*. In order to gain better insight into the dynamic process of epilepsy, a dynamic study on the cluster center movement across time-frame is necessary. Therefore, this study to shows the tracking of cluster centers movements across time-frame of *fEEG*. This movement tracking is essentials to understand the behavior of epilepsy such as the patterns of electrical potential. Further studies on the model could potentially assist in locating the problematic cells caused by epilepsy.

### KEYWORDS:

Electroencephalography's Cluster; Epileptic Seizure