

Project

I want to build a wearable EEG monitoring device specially catered to individuals with down syndrome which enable us to detect epilepsy seizures.

Individuals with Down syndrome have an increased risk for epilepsy during the whole lifespan, but especially after age 40 years. The increase in the number of individuals with DS living into late middle age due to improved health care is resulting in an increase in epilepsy prevalence in this population. However, these epileptic seizures are underdiagnosed and inadequately treated.

So, such a device would enable healthcare professionals and caretakers to properly handle the situation. A real time alert can be sent to them.

Existing research in this field includes EEG analysis in people with Down Syndrome, Machine Learning to detect epileptic seizures etc.

Didn't find specific research on such a device catered to specially to people with down syndrome.

Problems to address

- Proper designing of a wearable device which would be comfortable to wear considering the easy irritability of individuals with Down Syndrome.
- Understanding difference of brain waves in Down Syndrome individuals and developing accurate fault markers.
- Development of a proper algorithm which would in real time detect epileptic seizures which would factor in the differences in Down Syndrome individuals.

Solutions

- Utilize existing datasets of EEG analysis of Down Syndrome individuals and epilepsy seizures.
- Take help and guidance from Chemical Engineering profs or any others regarding materials for electrodes for extra comfort as well better and precise EEG analysis.
- Human resources for development of the Algorithm.

PS

I really believe that we can make this happen.