

## Centre for Medical Electronics

### Anna University, Chennai

#### 3.3.1 Institution has created an eco-system for innovations including Incubation centre and other initiatives for creation and transfer of knowledge

During the period of July 2017 to June 2018 Centre for Medical Electronics (CME) had received 2 sponsored projects funded by DST and LSRB-DRDO.

S.No	Name of the Project/ Endowments, Chairs	Name of the Principal Investigator/ Co Investigator	Sponsored by	Duration	Sanctioned amount in lakhs
1	Development of Low Cost Sweep VEP System	Dr. S. Shenbaga Devi	DST	2016-2019	44.8
2	Design and development of bio-potential signal analysis system for control of mobility assistive device	Dr. M. Sasikala (PI), Dr.S.Poonguzhali (CoPI)	LSRB-DRDO	2017-2020	30.5

#### 1. Development of Low Cost Sweep VEP System

##### Investigators:

**Dr.S.Shenbaga Devi**  
Professor & Director  
Centre for Medical Electronics  
Services  
Anna University, Chennai

**Dr.Parveen Sen**  
Senior Consultant,  
Vision Research Foundation  
18, College Road, Nungambakkam,  
Chennai – 600 006.

**Dr.Ronnie J George**  
Director – Research  
Deputy Director, Glaucoma

**Industry Partner**  
M/s Appasamy Assoicaites  
Chennai

##### Need for the device

- + Helps to quantify visual function.
- + Helps to assess objective visual function
- + Complementary test for amblyopia in pre-verbal children(lazy eye- 2 to 3 children out of 100)
- + Can be used to assess the visual pathway in neurological disorders
- + Amblyopia – if untreated , leads to monocular /visual impairment among young and middle aged adults(National Eye Institute- Part of National Institutes of Health).
- + In India, the prevalence of amblyopia is 0.8% in urban and 0.2% in rural children.

## Advantages

- + Conventional VEP takes more time than sweep VEP
- + Sweep VEP tests a wider range of acuity in a shorter time with automated analysis
- + Useful for
  - + Preverbal children
  - + Non cooperative subjects ( eg. people with psychological disorders )
  - + In individuals with developmental delay / sub normal comprehension

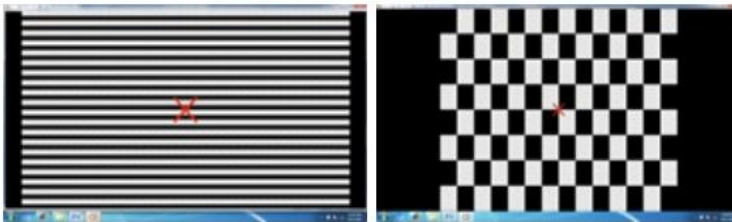
## Deliverables:

- + A system that can generate stimulus patterns at the required rate, can record steady state VEP signal and compute the parameters associated with visual acuity

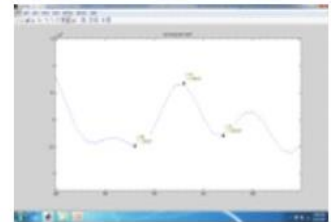
Comparison of Vision between normal eye and lazy eye



## Stimulus patterns :



## Extracted VEP from a subject



The corresponding work is filed for patent - Application No. 201941004031, and technology transferred with the industrial partner M/s Appasamy associates, Chennai.

## 2. Design and development of bio-potential signal analysis system for control of mobility assistive device

### Objectives:

- Development of Bio-potential signals (EEG, EMG and EOG) based control of mobility assistive device to offer a new means of communication for those with paralysis or severe neuromuscular disorders.
- Development of indigenous Bio-potential amplifier to acquire EEG/EMG/EOG signals, which can be used as control signals for mobility assistive device.
- Development of advanced signal processing and classification techniques to efficiently

identify the intended signatures from each of the bio- potential signals and validate the same



**Motor imagery EEG system for control of wheelchair**



**Indigenously developed EOG based control of wheelchair**



**Indigenously developed EMG based control of wheelchair**

### Applications:

- Biosignal based wheelchair can be used for those with amyotrophic lateral sclerosis (ALS), brain or spinal cord injury or other neuromuscular disorders.
- Biosignal based Robotic exoskeleton, help people with spinal injury to walk again using the developed signal processing algorithm.

### Workshop organized during this period

S.No	Workshop Title	Name of the Coordinators	Date	No of participants
1	Gait Analysis and Rehabilitation	Dr. M. Sasikala Dr.S.Poonguzhali Dr.T.Jayasree	4th and 5th October 2017	40
2	Brain computer Interface(BCI) and applications	Dr.S.Shenbaga Devi, Dr.N.Kumaravel, Mrs.T.Jayasree	21st and 22nd September 2017	50



The workshop was held at Mini auditorium, Department of ECE, CEG, Anna University Chennai.



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**University with potential for Excellence in Biomedical Engineering and Instrumentation (UPE-BI)**

During the year of 2017 to 2018 UGC awarded the coveted status of **University with Potential for Excellence in Biomedical Engineering and Instrumentation** and all the faculty members from the CME were actively involved in the implementation of the project.