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

2021-2022

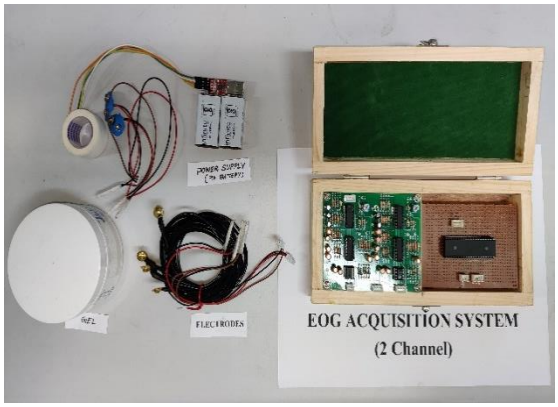
During the period of July 2021 to June 2022 Centre for Medical Electronics (CME) had received one funded project sponsored by LSRB-DRDO and one funded project recommended by SERB Power grant.

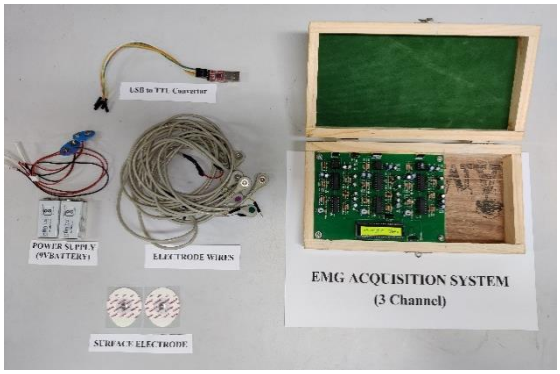
S.No	Name of the Project/ Endowments, Chairs	Name of the Principal Investigator/ Co Investigator	Sponsored by	Duration	Sanctioned Amount in Lakhs
1.	Productization and clinical evaluation of Bio potential signal analysis system for mobility assistance	Dr. M. Sasikala (PI), Dr.S.Poonguzhali (CoPI)	LSRB-DRDO	2021-2023	51.8
2.	Design and development of Real Time EMG pattern recognition for the control of below elbow Prosthesis	Dr.S.Nirmala Devi(PI) Dr.T.Jayasree(Co-PI)	SERB-POWER	2022-2025	Recommended 28.1

1. **Productization and clinical evaluation of Bio potential signal analysis system for mobility assistance**

   The proposed work has the following objectives

   - Product engineering of the developed prototype.
   - Clinical trials and validation of the developed system from subjects with neuromuscular disorders.
   - IEC 60601-1 certification for safety and effectiveness of the developed medical system, and IEC 60601-1-2 certification for safety and performance with regard to electromagnetic disturbances and emissions of the product.
   - Exploration of Transfer of technology (ToT) and commercialization.





Bio signals (EEG, EOG and EMG) based Acquisition system

Motor imagery EEG system for control of wheelchair

Indigenously developed EOG based control of wheelchair

Indigenously developed EMG based control of wheelchair

- Acquisition systems for the three different biosignals namely EEG, EOG and EMG are developed.
- These biosignals are acquired, processed and classified into control commands for the control of wheelchair.
- For EEG signals, Motor imagery signals (imagination of limb movements) are acquired from the scalp surface, processed and classified using deep learning.
- Horizontal and vertical eye movements captured from EOG signals.
- Muscle movements captured from EMG signals are classified into multiple classes using advanced signal processing and classification algorithm.
- The classifier output is converted into various control commands which are then given to the controller that controls the motion of the external mobility assistive device.
- The acquisition systems were validated on healthy individuals and amputees

Applications

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