ACTIVITY REPORT FORMAT

1. Name of the Department: CSE and MD

2. Name of the Activity: ISTE sponsored *One week FDP/SDP on "Bio-Medical Signal Acquisition and Analysis "*

3. Objectives: The objective of the FDP is to introduce computer based data acquisition and analysis techniques which are currently widely used in Biomedical Signal Processing. The acquisition of the brain signal will address the key issues which must be considered in order to properly acquire a particular physiological signal. Biomedical signals like ECG,EMG,EOG are also included in the acquisition part. The FDP will provide insight on analyzing an actual physiological signal, the electroencephalogram, which is a recording of the2ctiveity of the brain obtained from electrodes placed on the scalp. Many Statistical methods using popular tools like SPSS and many other platforms will be explored during the sessions.

4. Date, Time Venue of the Activity: *24th April 2023 to 28th April 2023, Computer lab of Dept of MD and MBA*

5. Name and details of collaborating agency (if it is collaborative/joint activity)- ISTE Sponsored

6. Brief summary of the Programme

The Key objectives of the workshop were to train participants to acquire, process and analyse electrical signals such as the ECG (Electrocardiogram), EMG (Electromyogram), EOG (Electrooculogram) and EEG (Electroencephalogram) signals.

Day 1 and Day 2 of the workshop focused on acquiring signals using wired, wireless and bluetooth methods. The resource persons from M/s Gentech Marketing and Distribution P. Ltd., demonstrated and gave hands-on training about use of BIOPAC hardware and software devices to acquire ECG, EMG and EEG signals. The physiology expert explained the significance and process of preparing the subject / patient before acquiring the physiological signals. Mr. Deepak, the technical expert helped with the technical aspects of the software required for signal processing. Dr. Baskaran, the Biomedical Engineer trained participants to acquire ECG, EMG and EEG signals using

gel electrodes, wired and wireless transmitters and to analyse signals through the free BIOPAC BSL Education software. He also demonstrated analyzing signals using AcqKnowledge data software. The team also gave a hands-on training of ECG, EEG and EDA acquisition using PLUX Biosignals (BI Talino) using smart phone devices and bluetooth technology.

On Days 3, 4 and 5 participants received theory and practical training about using statistical tools and methods for statistical data analysis.   Dr. Smita Shenoy from BMSCE introduced concepts of biostatistics, the multiple types of data, methods of statistical analysis, and confusion matrix measures. Later, Dr. Deepak from MSRIT, guided participants with the importance of hypothesis testing and stepwise approach to the same using different tests such as the z test, t test, ANOVA, ANCOVA and MANOVA. He gave hands-on training to participants to use with excel, and SPSS for statistical analysis.

He also detailed about huge data in time series analysis with 'r' statistical program. On the concluding day of the workshop, Dr. Smita Shenoy trained participants with data modeling, linear and logistic regression, correlations, chi square, log transform the data, calculate standard errors, coefficients and each of their significance in analyzing statistical significance of data. She also trained participants about how to use SPSS with cluster, factor, reliability and discriminant analysis. She highlighted the importance of using appropriate analysis methods to publish in journals.

Participants included people from industry and academia. Faculty, Research scholars and PG students from Machine Learning, Computer Science, Medical Electronics disciplines represented different academic institutes in Bangalore and Chennai.

Conveners of the program: Dr. Jyothi S Nayak, Professor and Head of Department of Computer Science & Engineering and Dr. Joshi Manisha S, Professor and Head of Department of Medical Electronics & Engineering. Faculty Coordinators: Dr. Kavitha Sooda, Associate Professor, Department of Computer Science & Engineering, BMSCE and Dr. Vijayalakshmi, K, Professor, Department

7. Outcomes

The participants had a intense insight to the data analysis and how to go about if any raw data is given. The other equipment show cased by Biopac gave the participants the usage of the medical device for signal acquisition.

8. Number of participants

Particulars	Number of Faculty		Non-Teaching Staff		External Participants	
	Male	Female	Male	Female	Male	Female
Number of Participants	1	3	1	3	09	13

9. Two or three relevant Photographs of the activity
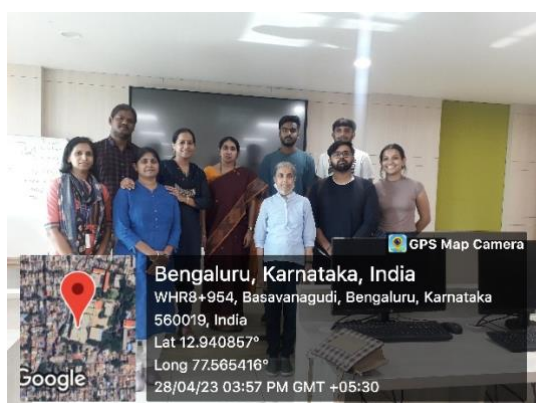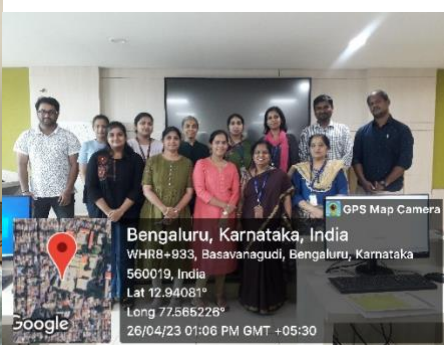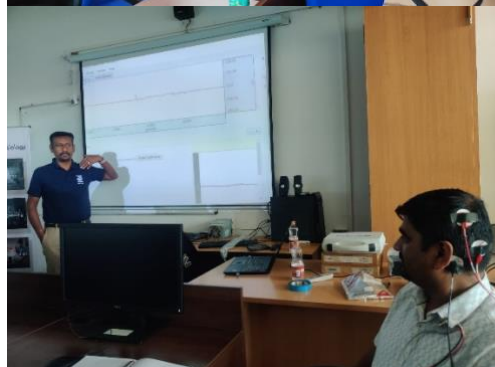
Supporting Documents
   a) Attendance sheet
   b) Circulars/Brochures