IEE EMBS Activity Report

Title : Educational Visit to BITS pilani, K K Birla Goa Campus To Explore Computer Technology in Neuroscience.

21 March 2025

MIT Art,Design and Technology University, Pune

Prepared by : IEEE EMBS MIT-ADT Student Branch Chapter

Approved By: Sujal Jadhavar

Title: Educational Visit to BITS pilani, K K Birla Goa Campus.

Objective: Educational visit to BITS pilani K K Birla, Goa Campus

Event Level: University Level

Date and Time: March 21, 2025 ; 11 AM To 4 PM

Participants Count : 16 (13 Students + 3 faculty members)

The Educational visit to BITS Goa, under **IEEE EMBS MIT-ADT Student branch Chapter** held on **21st March 2025** it was The intersection of computer technology and neuroscience has sparked groundbreaking developments in understanding the brain and creating innovative technologies that bridge the two fields. As part of our visit to the **Birla Institute of Technology and Science (**BITS) Goa, our focus was to explore how computer science, artificial intelligence, and other computational technologies are being leveraged to advance research and innovation in **Neuroscience.**

Group photo at the Main building of BITS pilani K K Birla GOA Campus

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Insightful Visit to Cognitive Neuroscience Lab

Cognitive Neuroscience lab

At the **Cognitive Neuroscience Lab**, we gained in-depth knowledge about EEG (Electroencephalography) data, including its collection process, necessary precautions, and further applications. EEG measures the brain's electrical activity using electrodes placed on the scalp, Once collected, EEG data undergoes preprocessing to remove noise using techniques like bandpass filtering and Independent Component Analysis (ICA). After cleaning, important features like power spectral density and frequency bands (delta, theta, alpha, beta, gamma) are extracted for analysis's, cognitive and psychological research, brain-computer interfaces (BCI) for assistive technology, mental health monitoring, and neurofeedback training to enhance focus and cognitive abilities. The session provided a comprehensive understanding of EEG, from data collection to processing and its transformative role in neuroscience and healthcare.
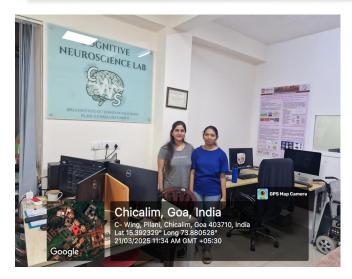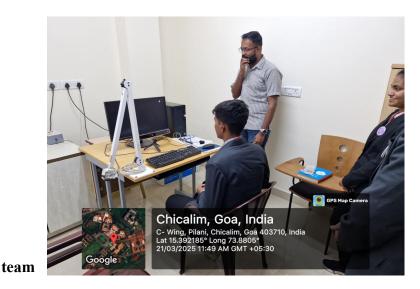
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Niharika Tewari & team Ranjith Jaganathan

Niharika Tewari explained her research about the dementia as it is the rising public health care concern globally emophasizing the importance of early assement and diagnosis .

One of her approch involves assessing congnitive abilities through Virtual reality and mobile based cognitive games ,incliuding navigation, Shopping and memory task, to identify individuals at risk of cognitive decline. Mam explained us in detail about the EEG-based grsph theory metrices helping in early detection and diffrential diagnosis.

Ranjith Jaganathan   provided students of MIT ADT University with a hands-on experience using an **eye tracker system**, a cutting-edge technology that tracks and visualizes eye movements in real time. This system detects the exact point where a person is looking this practical experience helped us understand the significance of eye-tracking in fields like virtual reality, marketing research, and medical diagnostics, making it a valuable learning opportunity.king on a screen and represents it with a dot, indicating the current focus of their eyesight.

Chicalim, Goa, India
9vrj+h7p, Pilani, Chicalim, Goa 403710, India
Lat 15.391449° Long 73.880964°
21/03/2025 12:30 PM GMT +05:30

Exploring innovation and Research: A Visit to iBrain lab

At iBrain Lab, we were privileged to know their ways to check the cognitive development of people. Also, we got to know about how efficiently different group of people grasp the knowledge on same topic via different medium including AI chatbots and Text books

Hema Nawani Neuroscientist Research Associate explained us in detail about her research on dementia research focuses on detecting dementia in individuals without a genetic or family history of the disease. Her study highlights alternative risk factors such as lifestyle choices,

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environmental exposure, chronic illnesses like diabetes and hypertension, and mental health conditions such as depression and social isolation. To aid early detection, she explores methods like cognitive assessments. biomarker-based blood tests, and AI-driven analysis of speech and facial patterns. The research emphasizes early intervention through lifestyle changes, medications, and cognitive therapies, offering new diagnostic tools beyond genetic testing to help identify and manage dementia at an early stage.

Soumya tripathi a phD student explained us about her research on the **A mixed method study idea on GenAI learning tools and compared to textbooks .** in which they use morrie a large language model build on the gpt frameworks the objective of her research was to compare the impact of AI-GPT tools with traditional methods it was comparison between mind map learning and comprehension retention. Her study was designed with Quantitative comparion & Qualitative comparsion respectively students deep undestanding about how we cam use AI-tools to ease out our work in our daily life

Group Discussion Activity

A group discussion was held at the **iBrain Lab,** where students from **MIT ADT University** interacted with a professor from BITS Pilani, along with faculty members and **researchers.** The session focused on exploring **future opportunities** and collaboration prospects for students in emerging fields in neuroscience. The professor introduced the lab's ongoing research projects and highlighted the growing demand for interdisciplinary knowledge in AI-driven industries.

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Students actively participated by asking about career pathways, higher studies, and research opportunities. The discussion also emphasized potential collaborations between MIT ADT and BITS Pilani through joint research projects.The session concluded with a **Q&A** segment, where students gained insights into industry trends and the significance of academic research. Overall, the discussion served as a platform for knowledge exchange, encouraging students to explore research-driven opportunities and fostering a potential academic partnership .

Felicitation of prof Veeky Baths by prof   Dr . Reena pagare

Head IEEE MIT-ADT Student Branch

Dr. Reena Pagare mam Head IEEE STB chair IEEE pune section is felicitating **Prof. Veeky Baths sir** in appreciation of his guidance and detailed explanation of the Cognitive Neuroscience Lab and the iBrain Lab at BITS Pilani, Goa .and also giving us the valuable insights about the current projects

Dr. Reena Pagare

Head,

IEEE MIT-ADT Student

Prof. Ganesh Pathak

Head of Department,

CSE.

Dr Vipul Dalal

Director,

School of Computing

Prof. Dr. Ramachandra Pujeri

Pro-Vice Chancellor,

(Technology Cluster)