



**Five Days Online
Faculty Development Program
on**

**Signal Processing for Cognitive
Neuroscience Applications**

January 17 - 21, 2022



Sponsored by:



AICTE, NEW DELHI
Under
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ORGANIZED BY

Department of Electronics and
Communication Engineering
National Institute of Technology Meghalaya
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Key Speakers

Dr. Sanjeev Kubakaddi ITIE Knowledge Solutions
Mr. Aneesh Mitra ITIE Knowledge Solutions
Mr. Alex MITSAR, Russia
Dr. Mahesh Jayachandra St. John's Hospital, Bangalore
Dr. Ksh. Milan Singh NIT Meghalaya
Dr. Satyendra Singh Yadav NIT Meghalaya
Dr. Balajied Nongrun Regional Director (Asia Pacific) Reasons to Believe

Registration Process

- ✓ No registration fee will be charged from the participants.
- ✓ **To register, please visit:**
<https://atalacademy.aicte-india.org/signup>
More Info: <https://www.aicte-india.org/atal>
- ✓ Due to limited seats, applications will be considered on First Come First Serve basis.

About the Institute

National Institute of Technology (NIT) Meghalaya is one among the thirty-one NITs in India established under the NIT Act 2007 (Amended 2012) of the Parliament of India as Institutes of National Importance with full funding support from the Ministry of Human Resource Development, Government of India. NIT Meghalaya was established in 2010 and started functioning from its temporary campus in Shillong in 2012. Its permanent campus is currently under development at Cherrapunjee. Presently the institute has nine (9) Departments and eight (8) Centres with a combined strength of 68 regular faculty members and 07 Trainee Teachers. All the departmental laboratories are well equipped with advance equipment/ instruments and experimental set-up.

The institute has been ranked among the top 100 engineering institutes in India by NIRF ranking for the last four years. The institute also bagged 28th rank among top 25 engineering institutes of the country under India Today Ranking. NIT Meghalaya is committed to basic long-term research in frontier areas. The goals are in the pursuit and advancement of scientific and technological research. The institute aspires to be a leading centre with research focus on achieving better scientific and technological mechanisms, discovering, and exploring new technologies, and improving technological standards through its core programmes.

About the Department

The Department of Electronics and Communication Engineering (ECE) was established in 2010 with the inception of National Institute of Technology Meghalaya. The department offers B. Tech Programme with an intake capacity of thirty & M. Tech Programme with an intake capacity of twenty in Electronics and Communication Engineering and Ph.D. program in various specialized areas of Electronics and Communication Engineering. The major research areas of the department include High Speed and Low Power VLSI, Computer Arithmetic, Wireless Sensor Networks, Cognitive Radio, Antenna Design and Signal Processing. The major areas of faculty expertise of the department include VLSI Systems, High Performance Computing, Signal Processing, Digital Signal Processing, Communication and RF & Microwaves Engineering.

Detailed Schedule

Dates	09:30 AM to 11:00 AM	11:00 AM to 11:30 AM	11:30 AM to 1:00 PM	1:00 PM to 2:00 PM	02:00 PM to 4:00 PM	4:15 PM to 4:45 PM
17.01.2022 (Monday)	*Registration and Inauguration *(10:30 AM to 11:15 AM)	Break	Session 1 Signal processing for cognitive science Dr. Ch. V. Rama Rao	Lunch	Session 2 Visualization of signal processing concepts Dr. Sanjeev Kubakaddi	Discussion & Feedback
18.01.2022 (Tuesday)	Session 3 Time / Frequency Analysis Dr. Sanjeev Kubakaddi	Break	Session 4 Filtering Concepts Dr. Sanjeev Kubakaddi	Lunch	Session 5 Lab on EEG Data Acquisition Mr. Aneesh Mitra	Discussion & Feedback
19.01.2022 (Wednesday)	Session 6 EEG Signals Dr. Sanjeev Kubakaddi	Break	Session 7 Brain Computer Interface Mr. Aneesh Mitra	Lunch	Session 8 Live Demo BCI Mr. Alex	Discussion & Feedback
20.01.2022 (Thursday)	Session 9 Introduction to Cognitive Neuroscience Dr. Mahesh Jayachandra	Break	Session 10 Signal Processing for Biomedical Application Dr. Ksh Milan Singh	Lunch	Session 11 Session on human values and ethics Dr. Balajied Nongrun	Discussion & Feedback
21.01.2022 (Friday)	Session 12 Machine Learning Techniques Dr. Satyendra Singh Yadav	Break	Session 13 Speech Emotion Recognition Dr. Ch. V. Rama Rao	Lunch	Session 14 Lab on Speech Emotion Recognition Dr. Ch. V. Rama Rao	Quiz & Feedback

Broad Scope

The importance of developing cognitive computation and cognitive neuroscience systems has long of interest. The research in this field is now rapidly expanding with the current influx of advanced signal processing innovations. Nowadays, solutions based on advanced signal processing are dramatically transforming the lives of humans and are having a profound impact on a wide range of disciplines and industries. This workshop brought together cognitive neuroscience and signal processing researchers not only to understand the human brain but also to improve signal processing approaches to identify

- How information processing happens on the level of neurons in the human brain
- How does sensory data become perception
- Data acquisition techniques
- Approaches in brain computer interface

The course contains theoretical lectures supported with practical sessions on signal processing applications in cognitive neuroscience. Invited talks will be delivered by academicians and industry persons who are working in this area.

Who can register: The faculty members of the AICTE approved Institutions, research scholars, PG students, participants from Government, Industry (Bureaucrats/Technicians/participants from Industry etc).

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Note: It is pure an online workshop