

# 2-Days International Webinar on Cognitive Science & Its Applications

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## Probable Speakers

Anupam Basu, Director, NIT Durgapur

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Aniruddha Sinha, TCS, Kolkata

Nischal K Verma, IIT Kanpur

Sanjay Kumar Saha, JU

Prabhat K Mandal, Director-in-Charge, NBRC, Haryana

## Organisers

Patron: Prof. Anupam Basu, Director, NIT Durgapur

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Program Committee: Chiranjib Koley, Mamata Dalui,

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Organizing Committee: Subhasish Karmakar, Supriti

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## About Webinar

The interdisciplinary, scientific study of the mind and its processes is known as cognitive science. Cognitive science deals with intelligence and behaviour, emphasising how nervous systems represent, process, and transform information. It investigates the nature, tasks, and functions of cognition (in a broad sense) - such as task-taking and decision-making. The webinar focused on applying electroencephalogram (EEG), functional near-infrared (fNIR), and machine learning in cognitive science.

EEG measures the electrical potential between two electrodes on the scalp, indicating that the electrical signal originates in the brain. The EEG signal is spontaneous but context-dependent; EEG generated during quiet rest differs quantitatively from EEG generated during cognitive processing. The temporal resolution of the EEG signal is on the order of milliseconds. As a result, postsynaptic changes are immediately reflected in the EEG, making this methodology ideal for tracking rapid changes in brain functioning.

One of the most important fields of application is cognitive neuroscience, where the mechanisms underlying brain functioning are investigated by monitoring changes in the brain during mental task execution. fNIRS allows for the study of cognition with few physical constraints, allowing for brain monitoring in a wide range of cognitive tasks.

Machine learning is a subset of artificial intelligence (AI) that enables software applications to become more accurate at predicting outcomes without explicitly programming them to do so. Machine learning algorithms signify new output values by using historical data as input rather than just analysing raw data.

Professor Tandra Pal

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