

Brief Report on Self-sponsored One-Week Online Short-Term Course on "AI for Healthcare and Instrumentation (AI *for* HI-2024)" from November 13 to November 17, 2024, by the Department of Instrumentation and Control Engineering, Dr. B. R Ambedkar National Institute of Technology Jalandhar.

Organizing Chair: Prof. Dilbag Singh, Prof. K. S. Nagla

Convener: Dr. Richa Sharma, Dr. Karan Jain

Coordinators: Dr. Afzal Sikander, Dr. Ravi Verma

The short-term course on AI for Healthcare and Instrumentation (AI *for* HI-2024) was successfully completed. We had 94 participants overall, including faculty members from different Institutes, research scholars, engineering students, and industry professionals from different domains. We began this course on November 13, exploring the dynamic intersection of Artificial Intelligence and Healthcare Instrumentation. This fusion holds great promise for improving patient outcomes, optimizing healthcare systems, and creating more effective and personalized treatments. The opening session was by Dr. Amit Bhardwaj from IIT Jodhpur, who discussed an interesting session on haptics and telesurgery—followed by a talk by Dr. Bhavsar from IIT Mandi on EEG signals and their decoding using deep learning methods. On Day 2, Dr Shiru Sharma from IIT-BHU gave enriching insights on Prosthetic hand development, followed by a talk on Semiconductor memories for AI hardware by Dr. Balwinder Raj, NIT Jalandhar. On day 3, there was a talk by Prof. Dilbag Singh on advanced medical imaging techniques, followed by a session with an Industry Expert, Mr. Pratyush Roy, from Mathworks on Medical Imaging and AI. On Day 4, we had a session on AI for Biomedical signals by Dr. Varan Bajaj from MANIT Bhopal, followed by a session on Functional Electrical Stimulation by Dr. Deepak Joshi from IIT Delhi. On day 5, we had a session with Prof. Ghosh from NIT Raipur, followed by our last session with an esteemed Industry Expert, Mr. Dhirendra Singh, on Drone technology. In these five-day-long STC, we have covered topics from machine learning models, biomedical imaging and signal technologies, AI-driven diagnostics, and the critical role of smart medical instrumentation in transforming healthcare delivery.

Photographs:

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Amit Bhardwaj (Presenting)

Data-Driven Haptics: Applications in Medical Simulators and Tele-surgery

Amit Bhardwaj
Associate Professor
Department of Electrical Engineering
Secondary Affiliations: School of AIDE & IDRP Robotics and Mobility Systems
IIT Jodhpur

11/13/2024 Amit Bhardwaj

Amit Bhardwaj
 Dr Dilbag Singh
 Naziya Shaikh
 Shivani Sinha
 Dr Afzal Sikan...
RAJESH BIROK
 Manoj Gupta
57 others
 Dr Richa Shar...

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Shiru Sharma (Presenting)

Upper-limb amputation

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Shiru Sharma
 Dr Afzal Sikan...
RAJESH BIROK
 Haneesh K M ...
 SUSAN VARG...
 Shikha Suman
 Taruna Saini
37 others
 Dr Richa Shar...

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Arnav Bhavsar Vinayak (Presenting)

1. Research: Perceptual Brain Decoding

- Perceptual Brain Decoding refers to an approach that uses the responses from brain (evoked by different stimulus) to identify the original stimulus.

Brain Response

Seen / Imagined Image

EEG Classification

Collection of brain responses

Pre-Processing

DL/ML Approach

Image Generation

Perceptual Brain Decoding Framework

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Arnav Bhavsar... Aneesha Acha... Pradip Patel

NEVIN AUGUS... muhammed s... Surya Lakshmi

Lakshmi Mada... 47 others Dr Richa Shar...

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Pratyush Roy (Presenting)

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Pratyush Roy Ramesh GNIT... Mugdha Sriva...

Lakshmi Mada... Neetu Sehra... Sripathi Raja V...

NEVIN AUGUS... 51 others Dr Richa Shar...