## ABOUT THE WORKSHOP

This workshop focuses on applying AI techniques to process and analyze biomedical signals (ECG, EEG, PCG) and medical images (MRI, CT scans, ultrasound). Participants will engage in hands-on projects, learning advanced topics like neural networks, transfer learning, and regularization. By the end, they will have practical experience in building deep learning models, making the course valuable for both beginners and professionals seeking to master the fundamentals of deep learning for real-world data analysis.

## COURSE OBJECTIVE

**Understand the Fundamentals of Biomedical Signal and Image Processing:** Equip students with a solid understanding of the key concepts of ECG, PGC, Lung Sounds, and MRI images.

**AI Techniques for Digital Healthcare:** Enable students to explore and implement ML and DL algorithms for the classification and analysis of biomedical signals and images.

**Develop Skills in Preprocessing and Denoising Biomedical Signals and Images:** Teach students effective preprocessing techniques, including noise reduction, normalization, and artifact removal, to enhance the quality and interpretability of biomedical data for AI applications.

**Design AI-based Solutions for Real-world Biomedical Challenges:** Guide students in developing AI-driven solutions to real-world problems in healthcare.

## COURSE CONTENT

1. **Introduction to Biomedical Signal and Image Processing:** Provide an overview of common biomedical signals (ECG, EEG, PCG, etc.) and medical imaging modalities (MRI, CT, X-ray, ultrasound) used in clinical practice.

2. **AI Techniques in Biomedical Signal Processing**
Explore how AI techniques, such as machine learning, deep learning, and neural networks, are being applied to process complex signals like ECG, EEG, and SCG.
Discuss applications in signal noise reduction, feature extraction, and classification to improve the accuracy of medical diagnoses.

3. **AI for Medical Image Processing:** Highlight the use of AI, particularly deep learning models in image segmentation, enhancement, and classification.

4. **Challenges and Limitations of AI in for Digital Healthcare Innovation:** Address the challenges related to AI implementation, including the need for high-quality labeled data, training on diverse datasets, and ensuring the generalization of AI models across patient populations.

5. **Hands-on Sessions:** Offer practical sessions where participants can learn how to apply AI models to biomedical signal datasets and medical images, using platforms such as Python, TensorFlow, or MATLAB.

---

SERB Sponsored

National Workshop
On

# AI for Digital Healthcare Innovations

## (AIDHI-2024)

(Hybrid Mode)

**15th–19th OCT 2024**

**Chairman**
Prof. Bibhudutta Sahoo, HoD (CS)

**Convener**
Dr. Puneet Kumar Jain

Department of Computer Science and Engineering
**National Institute of Technology Rourkela**

## ABOUT NIT ROURKELA

National Institute of Technology (NIT) Rourkela is an institution of national importance funded by the Ministry of Education. NIT Rourkela was established as Regional Engineering College (REC) on August 15, 1961. In India, it was ranked 16 among engineering colleges by the National Institutional Ranking Framework (NIRF) in 2023. For details about the institute please visit us at www.nitrkl.ac.in.

### ABOUT DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

Department of Computer Science & Engineering, NIT, Rourkela was established in 1982. Since its inception, the Department is under dynamic progress and is able to establish the reputation for imparting quality education both at undergraduate and graduate programmes. The department also offers Ph. D. for regular as well as sponsored candidates. Please visit https://website.nitrkl.ac.in/CS/ to know more about the Department of CSE. The department has well equipped modern laboratories such as Software Engineering, Distributed Object Systems, Information Security & Data Communication, Image Processing & Cluster Computing and Advanced Database Engineering Labs for pursuing research keeping in view of the technological advancement.

## TARGET PARTICIPANTS

The short-term course is of immense interest for UG/ PG students, research scholars/professionals, staff/ faculty members and industry professionals working in the area of Data Science. The participants from different Science and Engineering (Computer Science and Engineering, Electronics and Communication Engineering, Electrical Engineering, etc.) background will be benefitted with this course.

## IMPORTANT DATES

| | |
|---|---|
| Registration Starts | 20th September 2024 |
| Registration Ends | 13th October 2024 |
| Maximum Offline Participants (First Come First Serve Basis) | 60 |
| Registration Confirmation | 13th October 2024 |
| Course Schedule | 15-19th October 2024 |

## PREREQUISITES

1. The offline participants should bring their laptop.
2. Basics of programming language and data structure will be a plus.

## TOURIST PLACES NEARBY

**Khandadhar Waterfall**

**Pitamahal Dam**

**Vedvyas Temple**

**Mandira Dam**

## REGISTRATION & FEE PARTICULARS

| Registration Fee | |
|---|---|
| Students | Rs. 590/- |
| Faculty from Academic Institutions | Rs. 1,180/- |
| Employees from Industry and R&D Organizations | Rs. 2,360/- |
| **Accommodation Charges** | |
| Guest house (South / North block) | As Per Institute Norms |
| Hostel (for students) | |

(Lodging, boarding, lunch and dinner facility can be availed on separate payment basis and based on availability.)

### BANK ACCOUNT DETAILS FOR REGISTRATION

| | |
|---|---|
| Account Name: | CONTINUING EDUCATION NIT ROURKELA |
| Account No.: | 10138951784 |
| Bank Name | State Bank of India(002109) |
| Branch: | NIT Rourkela Campus |
| IFSC Code | SBIN0002109 |

### REGISTRATION FORM

To complete the online registration, the participants need to fill the following google form:

Click here for the Google Form Registration Link

| Patron | Prof. K. Umamaheswar Rao, Director, NIT Rourkela |
|---|---|
| Chairman | Prof. Bibhudatta Sahoo |
| Convener | Dr. Puneet Kumar Jain |

### Correspondence

Dr. Puneet Kumar Jain
Assistant Professor & Convener, **AIDHI -2024**
CS Department, NIT Rourkela, Odisha, India-769 008.
E-mail: **jainp@nitrkl.ac.in**

### STUDENT COORDINATORS

Mr. Pratyusa Dwibedy          Ms. Subhashree Sahoo
Phone:7978708824                8917457094