ABOUT THE WORKSHOP

This workshop will focus on foundational and advanced deep learning techniques, exploring their applications in real-world scenarios such as healthcare, autonomous systems, and intelligent decision-making. Participants will gain hands-on experience with neural networks, optimization strategies, and modern architectures, covering topics from convolutional and recurrent networks to attention mechanisms and generative models. The discussions will emphasize the mathematical foundations, practical implementations, and recent breakthroughs in deep learning research.

COURSE OBJECTIVE

- Understanding deep learning fundamentals, including neural networks, backpropagation, and gradient descent.
- Exploring modern architectures such as Convolutional Neural Networks (CNNs), Recurrent Neural Networks (RNNs), and Transformers.
- Optimization techniques like Stochastic Gradient Descent (SGD), Adam, and learning rate scheduling for efficient model training.
- Understand the working of recurrent neural networks and transformers for sequential data processing.
- Applications in computer vision and natural language processing, with practical implementations.
- Hands-on experience with deep learning frameworks like PyTorch and TensorFlow for real-world implementation.

COURSE CONTENT

1. Introduction to Deep Learning: Provide an overview of deep learning fundamentals, key architectures, and real-world applications.

2. Optimization Strategies: Explore optimization techniques such as gradient descent, Adam, and learning rate scheduling for efficient model training.

3. Convolutional Neural Networks (CNNs): Discuss CNNs for feature extraction, object recognition, and advanced architectures in deep learning applications.

4. Advanced Optimization Algorithms: Highlight the role of RMSProp, Adagrad, and Adam optimizers in improving deep learning model performance.

5. Backpropagation and Automatic Differentiation: Explain the backpropagation process and the importance of automatic differentiation in efficient model training.

6. Recurrent Neural Networks (RNNs) and Transformers: Cover sequence modeling techniques using RNNs and the role of transformers in attention mechanisms.

7. Hands-on Deep Learning: Provide practical sessions on implementing and training deep learning models using PyTorch and TensorFlow.

Department of Computer Science and Engineering
National Institute of Technology Rourkela

Short-Term Course
On

Deep Learning: Fundamentals and Implementation
(DLFI-2025)
(Hybrid Mode)
26th–30th May 2025

Chairman
Prof. Bibhudutta Sahoo, HoD (CS)
Convener
Dr. Anup Nandy
Dr. Ratnakar Dash

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 19th among engineering colleges by the National Institutional Ranking Framework (NIRF) in 2024. 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 has been under dynamic progress and has been able to develop a reputation for imparting quality education both in undergraduate and graduate programs. The department also offers Ph. D. for regular and sponsored candidates. Please visit https://website.nitrkl.ac.in/CS/ to learn 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 while keeping in view of 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	06th March 2025
Registration Ends	22nd May 2025
Maximum Offline Participants (First Come First Serve Basis)	60
Registration Confirmation	23rd May 2025
Course Schedule	26th-30th May 2025

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. 1180/- (online) Rs. 2,360/- (offline)
Faculty from Academic Institutions	Rs. 2,360/-
Employees from Industry and R&D Organizations	Rs. 2,360/-

Accommodation Charges

Guest house (South / North block) Hostel (for students)	As Per Institute Norms

(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:
https://forms.gle/hFhsXsdRe38U31gcA

Patron	Prof. K. Umamaheswar Rao, Director, NIT Rourkela
Chairman	Prof. Bibhudatta Sahoo
Convener	Dr. Anup Nandy and Dr. Ratnakar Dash

Correspondence
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STUDENT COORDINATORS

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