

# Science & Engineering Research Board (SERB)

Accelerate Vigyan  
Sponsored  
High End Workshop On

# ML/DL Application Enablement on PARAM Utkarsh HPC System

(High Performance Computing for  
ML/DL applications)

**18 July – 22 July 2022 at**

Centre for Development of Advanced Computing,  
Electronics City, Bengaluru – 560100

## Introduction

C-DAC Bangalore is conducting one week workshop “ML/DL application enablement on PARAM Utkarsh HPC system” for PG and PhD students. This is Accelerate Vigyan Sponsored High End Workshop scheduled from 18<sup>th</sup> July to 22<sup>nd</sup> July 2022.

## Objective of karyashala.

This karyashala is on HPC, AI and ML Technologies, designed with presentations, demo, hands-on sessions and invited talks. The aim is to demonstrate “PARAM Utkarsh” supercomputer and enable ML application on this. Participants will have opportunity to work on Supercomputer. The session on “Writing and Publishing Quality Technical Paper” is scheduled to refine the quality publications. Through this karyashal the participants can enhance their research methodology and learn new avenues of the technologies.

## About C-DAC

Centre for Development of Advanced Computing (C-DAC) is a Premier Scientific and Research Institution under MeitY, Government of India. C-DAC's major milestone projects include National Supercomputing Mission, Microprocessor Development Programme, Health, Education & Training, Language Technology Applications, Professional Electronics Technologies, IoT, Quantum Computing, Cyber Security & Forensics Applications, and Bio-Informatics applications.

## About NSM

The National Supercomputing Mission initiated by Government of India was launched to enhance the research capacities and capabilities in the country by connecting supercomputer with National Knowledge Network as the backbone, having the objective to meet the increasing computing demands of the scientific and research community. This initiative supports the government's vision “Digital India” and “Make in India”.

## About PARAM Utkarsh Supercomputer

PARAM Utkarsh is a High Performance Computing System setup at C-DAC, Bangalore under the National Supercomputing Mission (NSM), Government of India. This system offers Artificial Intelligence over Machine Learning & Deep Learning frameworks, Compute and Storage as a cloud service. This leads to reduced turnaround time to market of MSMEs and Startup India, thereby increasing their innovation potential. PARAM Utkarsh is based on Intel Cascade Lake processor and NVIDIA Tesla V100 GPU with 100Gbps infiniband non-blocking interconnect. Equipped with 50,000+ compute cores (CPU & GPU) and liquid cooling system for efficient PUE, PARAM Utkarsh offers peak computing power of 838 Teraflops.

## Advisory Board:

Smt. Sunita Verma, Scientist G, & Group Coordinator,  
Microelectronics Development Division, MeitY  
Dr. S. D. Sudarsan, Executive Director, C-DAC, Bangalore  
Dr. Sridharan R, Senior Director, C-DAC, Bangalore.

## Core Committee:

Shri Natraj A C  
Smt Divya M G  
Shri Soundararajan P  
Shri Sreekantha B A  
Shri Gokultheerthan M  
Dr Sanjay Adiwai

## Organizing committee:

Smt Jyotsna Muralidhar  
Shri Muthukumaran S  
Shri Sudhakar V V B  
Shri Mohamed Ashfaq



## How to apply

- Only the students pursuing their Masters or Ph D degree from a recognized University/Institution are eligible to apply.
- The applicants must produce a letter of Authentication (Approval from Organization) from their Supervisor/Head of the Department/Head of the Institute indicating their Association with the institute and “No Objection Certificate (NOC)” for allowing their students to undergo training in the workshop if selected. There is no dedicated format for the same, however it must be obtained from the Institute/University on their letter Head.
- Applicants must register Online. If selected NOC & Letter of Authentication must be produced and it's mandatory.
- As the number of participants in the workshop is limited to 25, the applicants will be selected on the basis of their area of research, motivation and Interest to attend the workshop.
- Only selected candidates will be informed by the email after a week of application deadline Therefore, the candidates must provide a valid E-mail ID while applying for the workshop.
- Shared accommodation in the Hostel with food and Travel Allowance as per GOI rules and guidelines will be provided to the selected candidates. It is one week residential course.
- The participants will be provided with the necessary stationary and consumables items for the workshop.
- Certificate will be provided after successful completion of the workshop to the participants.
- Last date for registration is 27<sup>th</sup> June 2022.



Registration link: <https://tinyurl.com/cdac-karyashala>

Registration Start date: 18<sup>th</sup> June 2022

Registration End date: 27<sup>th</sup> June 2022

Workshop cost: Nil

Mode of workshop: Offline @ C-DAC, Electronics City, Bangalore.

Duration: One Week Residential Course

Only 25 Participants will be selected through online interview

Selected Candidates will be intimated by

Email by 30<sup>th</sup> June 2022

### Contact Details

Phone: 9449994478

Email: [utkarsh-support@cdac.in](mailto:utkarsh-support@cdac.in)

## Speakers:

Dr S D Sudarsan, Executive Director, C-DAC, Bangalore.

Dr Janaki C H, Associate Director, C-DAC, Bangalore.

Prof Deepa Shenoy, Professor, UVCE, Bangalore.

Prof Navin Kumar, Associate Professor, Amrita Vishwa Vidyapeetham, Bangalore.

Mr Natraj A C, Associate Director, C-DAC, Bangalore.

Prof Abhishek Appaji, Associate Professor, BMSCE, Bangalore.

Dr Ramakrishnan Raman, Technology & Systems Leader, Honeywell Technology Solutions, Bangalore.

Mr Sreekantha B A, Joint Director, C-DAC, Bangalore.

Prof Pushpa Mala S, Assistant Professor, Dayananda Sagar University, Bangalore.

Mr Ramesh Naidu L, Joint Director, C-DAC, Bangalore.

Ms Divya MG, Joint Director, C-DAC, Bangalore.

Mr Mohit Ved, Joint Director, C-DAC, Bangalore.

Ms Priyanka Sharma, Principal Technical Officer, C-DAC, Bangalore.



## Program schedule:

Technical programs: 10 am - 6 pm, Lab Facility: 7am - 7pm

Day 1	Artificial Intelligence: Overview and Use cases
	Fundamentals and Principles of AI/ML/DL
	Machine Learning Techniques: Supervised and Unsupervised Learning
Day 2	Linux Tutorials*
	PARAM Utkarsh Supercomputer: Architecture, Service offerings, Software Stack
Day 3	High Performance Computing Application*
	Job submission*
	Deep Learning & Reinforcement Learning - Concepts
Day 4	Machine Learning & Deep Learning - Tools and Libraries
	ML Models for Behavior & Performance Predictions in Complex Systems
Day 5	Predicting the disease in Nephrology using ML techniques*
	ML/DL applications on HPC*
	Biomedical image processing using Machine Learning*
Day 5	Advances in AI: Fireside Chat
	Visit to PARAM Utkarsh HPC facility
	Imaging Prognosis and Digital Twin model for particle pollutant estimation*
	Writing and publishing quality technical paper
<b>*Presentation followed by demo and hands-on</b>	

C-DAC, No. 68, 4<sup>th</sup> Cross, Electronics City, Phase -I, Bangalore - 560100