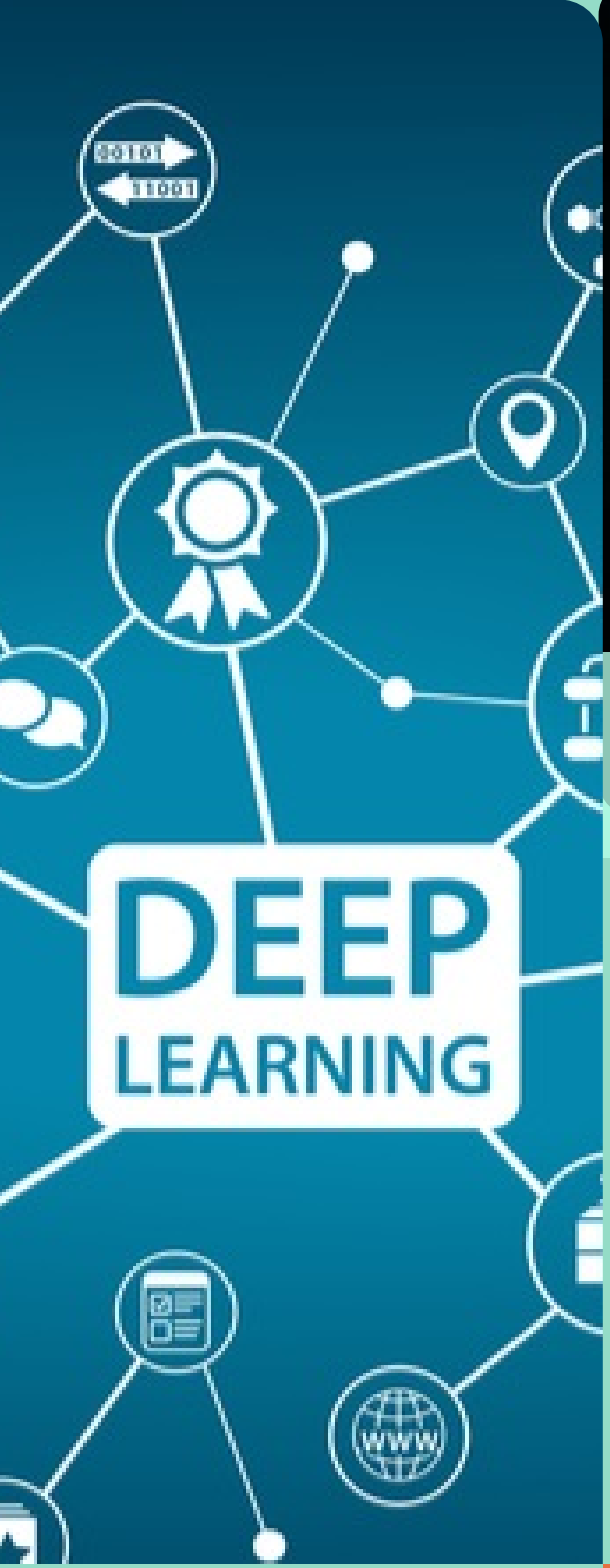

Let's Join
With Us

TWO DAY FDP
ON
GPU PROGRAMMING AND DISTRIBUTED DEEP LEARNING WITH PYTORCH: SCALING AND OPTIMIZATION

19 - 20 SEPTEMBER, 2023

Organised by

Department of Computer Science
Cochin University of Science and Technology
Cochin - 682022
Kerala

The Program

This comprehensive two-day workshop, titled "GPU Programming and Distributed Deep Learning with PyTorch: Scaling and Optimization," is a unique opportunity to dive into the advanced realms of deep learning and GPU programming. Led by the esteemed speaker Mr. Mahesh C, an Assistant Professor with extensive experience in GPGPU clustering and programming and recognized for his contributions to various technical domains, participants will explore topics such as multi-GPU training, multi-CPU and distributed computing, model optimization techniques, custom loss functions, efficient data loading, hyperparameter tuning, and more. Held at the prestigious Cochin University of Science and Technology (CUSAT), this workshop offers a deep dive into the world of GPU programming and distributed deep learning, equipping participants with the knowledge and skills needed to excel in the rapidly evolving field of artificial intelligence. Don't miss this opportunity to learn from a renowned expert and take your deep learning skills to the next level.

About us

CUSAT

Cochin University of Science and Technology (CUSAT) was established in 1971 with an emphasis on postgraduate studies and research in applied science, industry, and commerce. Since its inception, it has excelled in research and academic activities, contributing to solving significant societal, scientific, and engineering challenges. CUSAT's vision is to strive for excellence, compete globally in technical education, and focus on knowledge assimilation, generation, and dissemination. In its pursuit of international excellence, CUSAT has established academic collaborations with various universities in India and abroad. The main campus is located approximately 1 km off NH 544 (Old NH 47) in South Kalamassery. CUSAT is accredited with an 'A+' grade by NAAC and consistently ranks among the top universities in India.

Department of Computer Science

The Department of Computer Science was established in 1984, introducing the first M.Tech. course in Computer and Information Science in the state of Kerala. In 1986, the Department was recognized by the Defence Research and Development Organisation (DRDO) for offering an M.Sc. program in Computer Software, serving as a feeder course to DRDO Laboratories. The department played a pivotal role in seeding the establishment of the Computer Centre, which was inaugurated by the then Prime Minister in 1990. In June 1994, the department was entrusted with the responsibility of conducting the MCA program, contributing to its refinement and success. Currently, the department offers M.Tech programs in various specializations, a five-year integrated M.Sc. course, and Ph.D. programs. Active research is conducted in areas such as Artificial Intelligence, Computer Vision, Networking, and Information Systems Engineering. To date, the department has conferred approximately 40 Ph.D. degrees.

Head of the Department and Coordinator

Prof. (Dr.) Madhu S. Nair

Organizing Committee

- **Prof. (Dr.) G. Santhosh Kumar**
  Professor
- **Prof. (Dr.). Philip Samuel**
  Professor
- **Dr. Bijoy A. Jose**
  Associate Professor
- **Dr. Jereesh A. S.**
  Assistant Professor
- **Dr. Shailesh S.**
  Assistant Professor
- **Dr. Jeena Kleenankandy**
  Assistant Professor
- **Dr. Ajees A P**
  Assistant Professor

Patron

Prof. (Dr.) P.G.Sankaran
Vice Chancellor
Cochin University of Science and Technology

Advisory Committee

Dr. Meera V.
Registrar
Cochin University of Science and Technology

GPU PROGRAMMING AND DISTRIBUTED DEEP LEARNING WITH PYTORCH: SCALING AND OPTIMIZATION

Eligibility

Faculty members, research scholars, postgraduate students, and professionals working in industry.

Prerequisite

Prior familiarity with Deep Learning using Python is recommended.

Registration

LInk: https://forms.gle/xo3ZFmsqWNNGdSL1A

1. **Registration**: To participate in the event, Interested individuals must register through the provided registration link before 16 September, 2023.
2. **Selection**: There are a total of 20 seats available for the workshop, and they will be allocated on a first-come, first-served basis.
   - No TA/DA will be provided.
   - No Food and Accomodation

Venue

Venue: Department of Computer Science,
Cochin University of Science and Technology.
Date: 19-20 September, 2023.
Time: 10:00 AM - 4:00 PM.

Featuring Speaker

Mahesh C.
Assistant Professor.
Federal Institute of Science and Technology.
Coordinator, Center for High-Performance Computing.

About Mahesh C.

Mahesh C. is an esteemed Assistant Professor at the Federal Institute of Science and Technology(FISAT) with a rich background in guiding over 400 B.Tech projects. His expertise extends across several key technical domains, including:

- Design of Deep Learning Systems
- GPGPU Clustering and Programming
- Robotics and IoT
- Systems Integration & Administration

Recognitions:

- 2006 IEEE Leadership Award, IEEE Asia Pacific
- 2008 Best Developer, Cognizant-D&B

Address for Correspondence

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Workshop Highlights

Day 1: Advanced Topics in Deep Learning with PyTorch (6 hours)

Session 1: Distributed Training with Multiple GPUs (2 hours)

- Challenges in multi-GPU training
- Data parallelism vs. model parallelism
- Implementing distributed training with PyTorch

Session 2: Model Optimization Techniques (2 hours)

- Quantization and reducing model size
- Pruning and sparsity techniques
- Mixed-precision training for faster convergence

Session 3: Custom Loss Functions and Metrics (1 hour)

- Implementing custom loss functions
- Defining custom evaluation metrics
- Fine-tuning model performance

Day 2: Scaling and Optimization (6 hours)

Session 4: Multi-CPU and Distributed Computing (2 hours)

- Scaling to multiple CPUs
- Distributed computing with PyTorch
- Managing data and communication overhead

Session 5: Efficient Data Loading and Augmentation (1 hour)

- Optimizing data loading pipelines
- Data augmentation for improved model generalization
- Using PyTorch's data loading utilities

Session 6: Hyperparameter Tuning and AutoML (2 hours)

- Hyperparameter optimization strategies
- Tools like Optuna and HyperOpt
- Automated machine learning (AutoML) pipelines

Session 7: Workshop Conclusion and Q&A (1 hour)

- Recap of advanced topics covered
- Open Q&A session for participants
- Advanced resources and further learning