Self-Sponsored Workshop On

Quantum Computing for Machine Learning Applications

25th -29th March, 2024

REGISTRATION FORM

This is an online workshop. The participant(s) should check updates and register only below Google form:

Registration Link

https://forms.gle/aJGZKTobenVrjcvg9

Registration Details for Participants

The participants in the course will be faculty & Ph.D Scholars AI researchers, data scientists, and anyone interested in the convergence of quantum computing and AI. from Technical institutes. **The Registration fee as following:**

Participants	**Fee (Rs.)**
Student (UG/PG/Ph.D.)	750/-
Faculty Members	1,000/-
Industry Persons	1,200/-

Account details for Online payment of fee:

Acc. Name: Director MANIT

Acc. No.: 10020150107

IFSC code: SBIN0001608

Branch code: 001608

There will be no registration fees for MANIT students. This is online workshop.

Chief Patron

Dr. K. K. Shukla, Director, MANIT Bhopal

Patron

Dr. S. P. S.Rajput, Dean (ID & IR), MANIT Bhopal

Convener

Dr. Deepak Singh Tomar

Department of Computer Science and Engineering

Coordinators

Dr. Akhtar Rasool

Dr. Mitul Kumar Ahirwal

Dr. Vijay Bhaskar Semwal

Address for Correspondence

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Contact No.: 07541805885

Important Dates

Last date of receipt of application: 10th -March-2024.

Notification about selection: By email.

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Organized by

Department of Computer Science & Engineering

Maulana Azad National Institute of Technology

Bhopal -462003 (Madhya Pradesh)

About the Institute:

Maulana Azad National Institute of Technology Bhopal (An Institution of National Importance), offers various undergraduate and post graduate courses and research programs. Under the peaceful and friendly environment, MANIT is producing technocrats who are resources to Nation and the world. Our bright students with excellent technical skills have always contributed to the successes of various sections towards the technical group.

The total area of campus is 650 acres and protected by boundary wall and ring road. The entire campus consists of administrative and academic building, workshop, Library and community center, Residential area accommodation for students and staff and other general amenities such as post office, Shopping complex, a School for children, dispensary, an auditorium with the capacity of 1000 persons and sports complex with vast expanse of open area.

About Department:

The computer science and engineering department was established in the year 1986. Since the inception, it is consistently creating its place of excellence not only within the institute but among its counter parts in the country and abroad. Bright students from all the parts of the country for quality education in computer science and engineering at under graduate, post graduate, and doctoral levels are attracted. The department has highly qualified and competent faculty members, and adequate facilities to support teaching and learning activity.

About Workshop:

This workshop is the seventh workshop conducted by the coordinators & CSE department and first workshop on Quantum Computing. The title of first workshop was "*Artificial Intelligence and Machine Learning Applications*" and conducted in Dec. 2019. The second workshop was sponsored by ATAL academy on "*Artificial Intelligence"* and conducted in May 2020. Third workshop on Robotics sponsored by ATAL academy. Fourth and Fifth was on *Artificial Intelligence and Machine Learning* self-sponsored. The Sixth was on Optimization technique for deep learning.

The aim of Quantum Computing for ML application workshop is to bridge the gap between quantum computing and artificial intelligence, providing participants with the knowledge and skills to navigate this exciting interdisciplinary field. We look forward to the collaboration and innovation that will undoubtedly emerge from this workshop. Course covered in this workshop is designed to provide an exposure to the fundamentals of Quantum Computing, Linear Algebra and statics, Machine Learning and Parallel Computation with their applications. Participants will learn the implementation on quantum simulator, python, Open MPI and various other tools of machine learning

This course will be useful for faculty of engineering and sciences, research scholars who are interested in the learning of Quantum Computing, Artificial Intelligence, & Machine Learning models. In recent years, the intersection of quantum computing and machine learning has emerged as a groundbreaking field with the potential to revolutionize the way we approach complex problem-solving. This workshop aims to provide participants with a comprehensive introduction to quantum computing and its applications in the realm of machine learning.

Course contents

- Overview of classical vs. quantum computing.
- Quantum bits (qubits) and their properties.
- Introduction to Quantum Gates and Circuits, algorithms (Grover's algorithm) and Quantum parallelism hardware
- Introduction to Quantum Machine Learning, SVM, Neural Networks and it's implementation.
- Advance topics Quantum enhanced optimization and Quantum Cryptography
- **Idea and discussion over SERB-DST project writing and submission, and technical paper writing.**

Resource Person:

1.Dr. Akhtar Rasool (Asstt.. Prof. MANIT Bhopal)
2.Dr. Mitul Kumar Ahirwal (Asstt.. Prof. MANIT Bhopal)
3.Dr. V. B. Semwal (Asstt.. Prof. MANIT Bhopal)