BOOST
THE LEADING TRAINING PROVIDER

Information Technology

Quantum Machine Learning

Course Introduction

Quantum Machine Learning (QML) merges quantum computing with machine learning to address complex problems and enhance computational capabilities. This course will explore how quantum computing can revolutionize machine learning algorithms and models, providing practical insights and hands-on experience in this cutting-edge field.

Target Audience

- Data Scientists and Machine Learning Engineers
- Quantum Computing Enthusiasts
- Researchers and Academics
- IT Professionals and Developers
- Advanced Students in Computer Science and Engineering
- Technology Strategists and Innovators

Learning Objectives

- Understand the principles of quantum computing and how they apply to machine learning.
- Explore quantum machine learning algorithms and their advantages.
- Gain hands-on experience with quantum machine learning tools and frameworks.
- Apply quantum algorithms to solve real-world machine learning problems.

- Analyze the potential and challenges of quantum machine learning in various domains.

Course Outline

- **Day 01**

  Module 1: Introduction to Quantum Computing and Machine Learning

  - Basics of Quantum Computing and Quantum Bits (Qubits)
  - Overview of Machine Learning Concepts and Algorithms
  - How Quantum Computing Enhances Machine Learning
  - Hands-On Exercise: Visualizing Quantum Concepts and Machine Learning Models
  - Case Study: Applications of Quantum Computing in Machine Learning

- **Day 02**

  Module 2: Quantum Algorithms for Machine Learning

  - Quantum Algorithms Overview (e.g., Quantum Support Vector Machines, Quantum Neural Networks)
  - Quantum Data Encoding and Feature Mapping
  - Quantum Variational Algorithms (e.g., Variational Quantum Eigensolver)
  - Hands-On Exercise: Implementing Basic Quantum Machine Learning Algorithms

  Case Study: Real-World Applications and Benefits of Quantum Algorithms

- **Day 03**

  Module 3: Quantum Machine Learning Frameworks and Tools

  - Introduction to Quantum Machine Learning Frameworks (e.g., TensorFlow Quantum, PennyLane)
  - Quantum Computing Platforms and Tools (e.g., IBM Qiskit, Google Cirq)

- Developing and Testing Quantum Machine Learning Models
- Hands-On Exercise: Using Quantum Frameworks to Build and Train Models
- Case Study: Tools and Frameworks in Quantum Machine Learning Projects

• **Day 04**

Module 4: Advanced Quantum Machine Learning Techniques

- Quantum Data Analysis and Feature Extraction
- Quantum-enhanced Reinforcement Learning
- Hybrid Quantum-Classical Machine Learning Models
- Hands-On Exercise: Developing Advanced Quantum Machine Learning Models
- Case Study: Innovations and Advanced Techniques in Quantum Machine Learning

• **Day 05**

Module 5: Future Trends and Challenges in Quantum Machine Learning

- Emerging Trends and Research Directions in Quantum Machine Learning
- Challenges and Limitations of Quantum Machine Learning
- Potential Applications and Industry Impact
- Hands-On Exercise: Exploring Future Scenarios and Innovations
- Case Study: Cutting-Edge Projects and the Future of Quantum Machine Learning

Confirmed Sessions

FROM	TO	DURATION	FEES	LOCATION
April 14, 2025	April 18, 2025	5 days	4250.00 $	UAE - Dubai
Aug. 18, 2025	Aug. 22, 2025	5 days	5950.00 $	switzerland - Geneva

FROM	TO	DURATION	FEES	LOCATION
Oct. 20, 2025	Oct. 24, 2025	5 days	4250.00 $	UAE - Dubai