

Model Deployment and Monitoring - 24 academic hours

Workshop Overview:

The **Model Deployment and Monitoring** workshop focuses on deploying, operating, and maintaining Machine Learning models in production environments. The workshop bridges the gap between model development and real-world production systems, emphasizing scalability, reliability, automation, and continuous monitoring.

Throughout the workshop, participants learn how to deploy machine learning models using batch and real-time strategies, integrate CI/CD pipelines into ML workflows, monitor model performance and system health, and manage testing and observability in production-grade ML systems. The workshop combines architectural understanding with hands-on, production-oriented practices used in modern MLOps environments.

What Participants Gain?

- Practical skills in deploying ML models to production using batch and real-time strategies
- Ability to design and operate CI/CD pipelines for ML systems
- Hands-on experience with monitoring model performance, system metrics, and logs
- Applying testing methodologies (unit, integration, performance) in MLOps workflows
- Operating scalable ML pipelines using distributed and streaming technologies (e.g., Spark, Kafka/Flink)
- Managing end-to-end model deployment and monitoring in real production environments

Target Audience

- Data Scientists and ML Engineers aiming to deploy and maintain Machine Learning models in production
- Data Engineers responsible for batch processing, streaming pipelines, and ML infrastructure
- DevOps engineers involved in AI and Machine Learning systems
- Developers working on data-driven or ML-based production systems
- Data and technology professionals seeking hands-on experience in production-grade MLOps workflows

Prerequisites

- Basic familiarity with Machine Learning concepts and model development workflows
- Experience with at least one programming language, preferably Python
- Basic understanding of data processing concepts and workflows
- General familiarity with DevOps concepts is an advantage
- Good technical English proficiency

Workshop Syllabus

- **Model Deployment Strategies**
 - Deployment strategies for machine learning models including Batch and Real-time
- **Monitoring and Logging**
 - Monitoring model performance, system metrics, and logs
 - Monitoring tools
- **Understanding Batch Processing**
 - Batch processing in the context of machine learning
 - Implementing Batch Jobs
 - Tools and frameworks (Apache Spark) for distributed batch processing
- **Introduction to CI/CD in MLOps**
 - Principles of Continuous Integration and Continuous Deployment in MLOps
 - Implementing CI/CD Pipelines
 - Testing, building, and deployment into automated workflows
 - Creating an end-to-end Batch processing with CI/CD
- **Real-time Processing in ML**
 - Fraud detection and recommendation systems
 - The principles of real-time data streaming
 - Real-time Processing Technologies (Kafka/Flink)
- **Testing in MLOps**
 - Testing methodologies include unit testing, integration testing, and performance testing
 - Automated Testing Frameworks (pytest)