BLACKBIRD FOR TRAINING

MLOps – Managing Machine Learning in Production

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Introduction

As organizations increasingly rely on artificial intelligence and machine learning to drive innovation, the challenge has shifted from building models to managing them effectively in production environments.

The MLOps - Managing Machine Learning in Production course focuses on bridging the gap between model development and operational deployment, ensuring that machine learning systems are scalable, reliable, and continuously improving.

This program provides a complete understanding of how to design, deploy, monitor, and maintain machine learning models in real-world production systems. Participants will gain the technical and strategic skills needed to integrate machine learning operations into their organizational infrastructure while maintaining high standards of performance, security, and compliance.

Course Objectives

By the end of this course, participants will be able to:

- Understand the key principles of managing machine learning in production environments.
- Design end-to-end MLOps pipelines covering model development, deployment, and monitoring.
- Apply automation techniques to streamline machine learning workflows.
- Monitor model performance and identify potential drifts or inefficiencies.
- Ensure data quality and version control across the entire model lifecycle.
- Manage multiple versions of models and track changes systematically.
- Implement security, governance, and compliance frameworks for ML systems.
- Foster collaboration between data scientists, engineers, and operations teams.

Course Outlines

Day 1: Fundamentals of MLOps and Model Lifecycle

- Introduction to MLOps and its importance in modern enterprises.
- Understanding the differences between model development and production deployment.
- Exploring the stages of the machine learning lifecycle.
- Common challenges in transitioning from research to production.
- Key tools and frameworks used in managing ML systems.
- Practical exercise: designing a simple end-to-end ML lifecycle.

Day 2: Building the Production Environment and Data Management

- Overview of infrastructure requirements for deploying ML models.
- Managing data pipelines for training, testing, and validation.
- Ensuring data quality, consistency, and version control.
- Integrating multiple data sources within a unified platform.
- Automating preprocessing and data ingestion workflows.
- Case study: building a data workflow for production ML models.

Day 3: Model Deployment and Performance Monitoring

- Core strategies for deploying machine learning models into production.
- Integrating models with business systems and applications.
- Setting up monitoring systems to track accuracy and latency.
- Detecting and addressing model drift and performance degradation.
- Defining key performance indicators KPIs for ML models.
- Hands-on session: deploying and monitoring a model in a simulated environment.

Day 4: Automation, Governance, and Security

- Applying automation to model retraining and deployment pipelines.
- Scheduling updates and version rollouts automatically.
- Managing model repositories and ensuring traceability.
- Implementing data and model governance policies.
- Securing machine learning systems and ensuring compliance with regulations.
- Real-world examples of successful MLOps governance practices.

Day 5: Continuous Improvement and Final Evaluation

- Applying continuous learning and retraining mechanisms.
- Evaluating model performance and operational health over time.
- Addressing organizational and cultural challenges in MLOps adoption.
- Capstone project: building a full MLOps pipeline from data to deployment.
- Presentation and peer feedback session.
- Final review and key takeaways for enterprise implementation.

Why Attend this Course: Wins & Losses!

- Gain a deep understanding of how to manage machine learning models in production.
- Develop practical skills to design and maintain reliable ML pipelines.
- Improve model accuracy and reduce operational risks.
- Implement automation for faster, more consistent ML deployment.
- Strengthen collaboration between data science and operations teams.
- Ensure compliance with governance and data-security standards.
- Enhance decision-making through stable and high-performing ML systems.
- Acquire advanced, in-demand skills essential for modern data-driven organizations.

Conclusion

The MLOps - Managing Machine Learning in Production course is essential for professionals aiming to operationalize artificial intelligence effectively.

It goes beyond model development to focus on the full lifecycle — from data management and deployment to monitoring, retraining, and governance.

Through a combination of theory, practical exercises, and real-world case studies, this course equips participants with the knowledge to build resilient, efficient, and scalable machine learning systems.

It empowers organizations to turn intelligent models into dependable, continuously improving assets that drive innovation and strategic growth.