MLOps Boot Camp | ML in Action: Deploy, Monitor, and Master - TTML5517

Gain the skills required to proficiently manage, deploy, and monitor machine learning models in real-world environments

Duration: 4 Days
Skill Level: Intermediate
Available Format: Instructor-Led Online ; On Public Schedule

Learning MLOps empowers professionals to efficiently manage, deploy, and monitor machine learning models, ensuring robust, scalable, and reliable AI-driven solutions in real-world applications. Welcome to Trivera's MLOps Boot Camp, a specialized hands-on program crafted for Python-proficient professionals aiming to gain practical expertise in the world of machine learning operations (MLOps).

What You'll Learn

Overview

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Throughout the course, our engaging machine learning expert will guide you through hands-on labs and share rich experiences, offering practical insights into managing and deploying machine learning models effectively. Each session is geared towards building fundamental skills in areas such as experiment management, workflow orchestration, model deployment, and monitoring. The workshop style sessions are crafted to simulate

real-world scenarios, equipping you with the necessary skills to handle the complexities of MLOps in a professional setting.

By the end of this immersive boot camp, you will emerge with a comprehensive understanding of how to apply MLOps principles and practices. The course emphasizes developing problem-solving skills and building confidence in applying MLOps strategies. Whether it's enhancing the efficiency of your ML projects, ensuring model reliability, or contributing to your team's success, the skills you gain here will be immediately applicable in your professional life.

Objectives

Working in a hands-on learning environment you'll learn to:

- Develop the ability to efficiently manage and track machine learning experiments, honing skills in organizing and analyzing ML workflows.
- Master the techniques of deploying machine learning models across various environments, focusing on adaptability and effectiveness.
- Acquire hands-on experience in orchestrating ML workflows, learning to convert theoretical models into practical, executable pipelines.
- Enhance skills in monitoring and maintaining the performance and reliability of machine learning models in operational settings.
- Cultivate proficiency in implementing MLOps best practices, emphasizing code quality, testing methodologies, and continuous integration.
- Build problem-solving capabilities and confidence in applying MLOps strategies, preparing for immediate and impactful application in professional scenarios.

If your team requires different topics, additional skills or a custom approach, our team will collaborate with you to adjust the course to focus on your specific learning objectives and goals.

Audience

The MLOps Boot Camp is an intermediate-level program suited for technical professionals interested in learning about putting ML in production. Attendees would include data scientists, ML engineers, and software developers seeking to deepen their

understanding of MLOps. It's perfect for those looking to enhance their practical skills in managing, deploying, and monitoring ML models within their organizations.

Pre-Requisites

This is an intermediate-level program, designed to prepare attendees for a deeper dive into next-level, heavy hands-on machine learning courses and workshops. Attendees should have practical, hands-on experience working with Python for Data Science.

- Proficiency in Python programming, with a solid understanding of its syntax and common libraries used in data science and machine learning.
- Familiarity with fundamental data handling and processing techniques, including working with datasets in various formats.
- Working with Docker

Next Steps / Follow-on Courses: We offer a wide varietyof follow-on courses and learning paths for Generative AI, AI for Business, GPT, Applied AI, Azure OpenAI, Google BARD, AI for developers, testers, data analytics, machine learning, deep learning, programming, intelligent automation and many other related topics. Please see our catalog for the current **AI & Machine Learning Courses, Learning Journeys& Skills Roadmaps**, list courses and programs.

TTAI2810   Mastering Machine Learning Operations (MLOps) and AI Security Boot Camp

Agenda

Please note that this list of topics is based on our standard course offering, evolved from typical industry uses and trends. We'll work with you to tune this course and level of coverage to target the skills you need most. Topics, agenda and labs are subject to change, and may adjust during live delivery based on audience skill level, interests and participation.

Module 1: Foundations of MLOps

Objective: Build a solid foundation in MLOps by understanding its essential concepts, scope, and maturity. This module focuses on developing the ability to conceptualize and articulate the importance of MLOps in the data science landscape.

Topics

- Introduction to MLOps: Definition and Scope
- Understanding the MLOps Maturity Model
- Case Study: Analyzing New York Taxi Trips Dataset
- The Necessity of MLOps in Modern Data Science
- Course Outline and Expectations
- Setting Up the Learning Environment
- Assignment: Basic MLOps Conceptualization
- Additional Resources

Module 2: Managing Experiments and Models

Objective: Equip yourself with the skills to efficiently manage and track machine learning experiments and models. Learn to navigate the complexities of experiment tracking and model management, enhancing your ability to handle real-world ML scenarios.

Topics

- Fundamentals of Experiment Tracking
- Kickstarting with MLflow for Experiment Management
- Advanced Experiment Tracking using MLflow
- Techniques in Model Saving and Loading with MLflow
- Introduction to Model Registry in MLflow
- Practical Applications of MLflow in Real-World Scenarios
- Assignment: Experiment Tracking and Management
- Further Reading

Special Session: Weights and Biases Workshop

Engage in an immersive workshop focused on the practical application of Weights and Biases in ML projects. This session aims to enhance hands-on skills in utilizing Weights and Biases for optimizing and tracking machine learning experiments, fostering a deeper understanding of how to effectively manage and monitor model performance.

Module 3: Workflow Orchestration and ML Pipelines

Objective: Delve into the intricacies of ML workflow orchestration and pipeline development. This module is about gaining practical skills in transforming ideas into executable ML workflows and understanding the dynamics of efficient pipeline deployment.

Topics

- Principles of Workflow Orchestration in ML
- Exploring Prefect 2.0 for ML Workflows
- Converting Notebooks into Executable Pipelines
- Deploying Prefect Flows for ML Operations
- Assignment: Building and Deploying a Simple ML Pipeline
- Supplementary Information

Module 4: Strategies for Model Deployment

Objective: Explore and master diverse strategies for deploying machine learning models. This part of the course is designed to provide hands-on experience in deploying models across different environments, emphasizing the adaptability of ML solutions.

Topics

- Overview of Model Deployment: Online, Streaming, and Offline Methods
- Implementing Web Services for Model Deployment using Flask
- Streaming Model Deployment: AWS Kinesis and Lambda Integration
- Offline Batch Processing for Data Scoring
- Assignment: Deploying ML Models in Various Environments
- Additional Insights

Module 5: Monitoring ML Models

Objective: Gain expertise in the critical area of monitoring ML models in various operational environments. Learn the art of maintaining model performance and reliability, ensuring that your ML solutions continue to deliver value post-deployment.

Topics
- Monitoring Techniques for ML-Based Services
- Web Service Monitoring using Prometheus, Evidently, and Grafana
- Monitoring Batch Jobs with Prefect, MongoDB, and Evidently
- Extended Monitoring

Module 6: MLOps Best Practices

Objective: Dive into the best practices of MLOps, focusing on enhancing code quality and implementing effective testing methodologies. This module aims to instill a deep understanding of the standards and practices that underpin successful MLOps strategies.

Topics

- Testing Methodologies: Unit and Integration Tests
- Python Code Quality: Linting and Formatting
- Implementing Pre-commit Hooks and Makefiles
- Continuous Integration and Deployment with GitHub Actions
- Infrastructure Management using Terraform
- Assignment: Applying Best Practices in a Sample Project
- Further Exploration

Capstone Project: Comprehensive MLOps Implementation

Apply all the skills and knowledge acquired in a comprehensive, real-world MLOps project. This capstone is about demonstrating your ability to integrate various MLOps concepts and techniques into a cohesive and functional whole.

Related Courses

TTAI2810	Mastering Machine Learning Operations (MLOps) and AI Security Boot Camp
TTML5503	Introduction to AI & Machine Learning JumpStart

All applicable course software, digital courseware files or course notes, labs, data sets and solutions, live coaching support channels, CodeCoach.AI anytime tutor access, and rich extended learning and post training resources are provided for you in our "easy access, single source, no install required" online **Learning Experience Platform (LXP),** remote lab and content environment. Access periods vary by course. We'll collaborate with you to ensure your team is set up and ready to go well in advance of the class. Please inquire about set up details and options for your specific course of interest.

For More Information

Please contact us or call 844-475-4559 toll free for more information about our training services (instructor-led, self-paced or blended), coaching and mentoring services, public course enrollment or questions, partner programs, courseware licensing options and more.