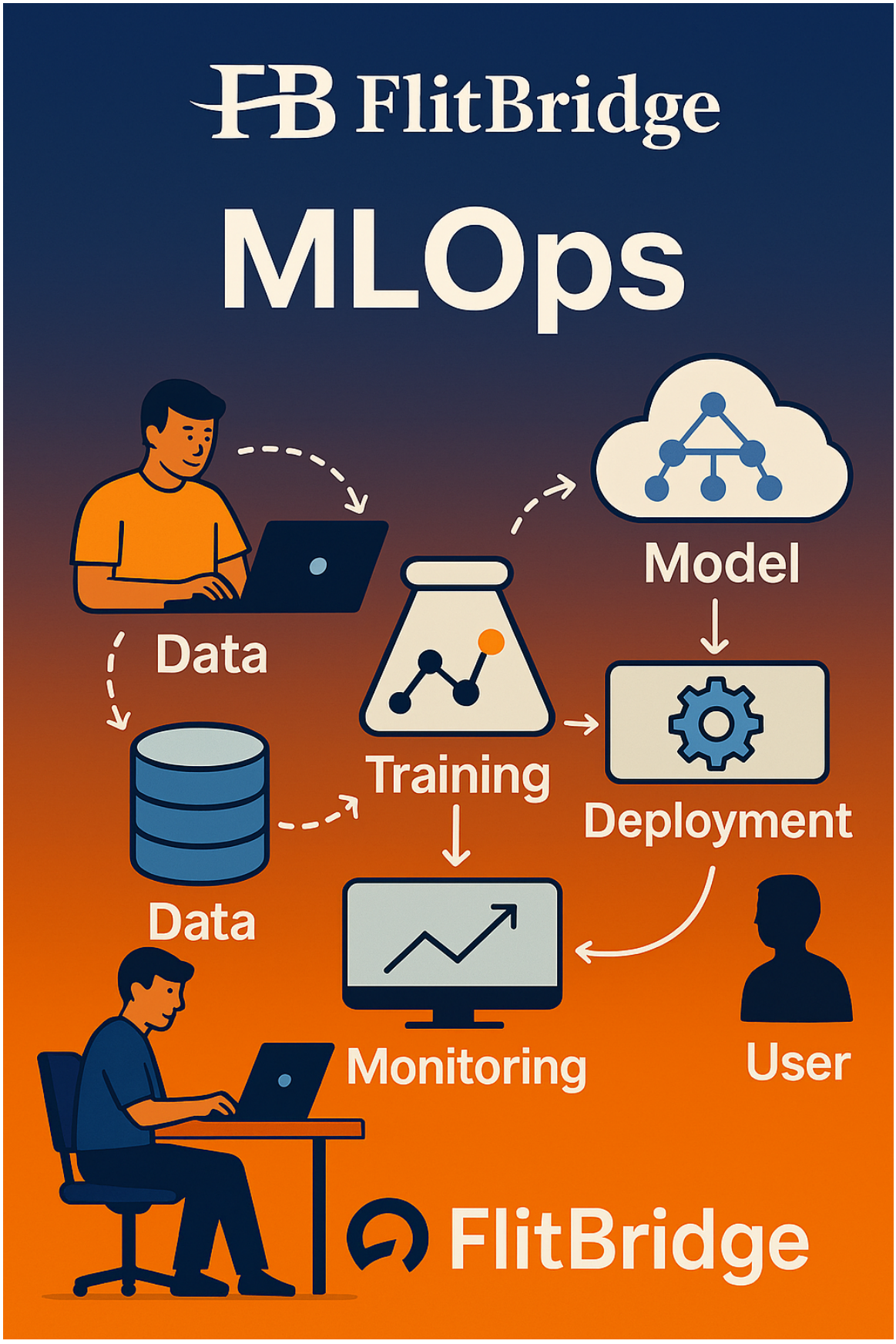
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MLOps
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Unlock Your Potential with Flitbridge's Comprehensive MLOps Program

Step into the future of machine learning with Flitbridge's all-inclusive MLOps course. Designed to help you master advanced tools and techniques, this program dives deep into the critical aspects of deploying, monitoring, and managing machine learning models in real-world production environments.
Through hands-on, industry-relevant projects and practical use cases, you'll gain the confidence to apply your knowledge effectively and solve complex operational challenges. Join today and accelerate your career to new heights in the rapidly evolving world of AI and MLOps.

Machine Learning Operations (MLOps)

■ Module 1: MLOps Fundamentals (Machine learning)
- MLOps fundamentals and lifecycle
- DevOps vs MLOps: similarities & differences
- Core MLOps principles: versioning, automation, reproducibility
- MLOps Architecture
- MLOps tools landscape

■ Module 2: Data Engineering Basics for MLOps
- Basics of ETL/ELT pipelines
- AWS Glue
- Data preprocessing automation

■ Module 3: Version Control System
- Git Essentials
- GitHub actions.
- GitHub commands and branching strategy.
- Real time scenarios of using GitHub.
- DVC (Data version control).
- MLOps Pipeline
- MLOps Lifecycle management.

■ Module 4: Cloud based MLOps
- Model management
- Data Versioning and Code Versioning.
- Model monitoring.
- Overview of Model management tools.
- ML Flow

■ Module 5: Docker & Kubernetes for MLOps
- Introduction to containers & Docker architecture
- Writing Docker files for ML applications
- Containerizing ML models (scikit-learn / PyTorch)
- Best practices: multi-stage builds, environment reproducibility.
- Container Orchestration.
- AWS Elastic Kubernetes Service (EKS) setup
- Deploying Dockerized ML models on EKS

- Kubernetes Introduction & Architecture
- Kubernetes Node Pools
- Kubernetes POD's
- Kubernetes Deployments
- Kubernetes Networking models
- Kubernetes Namespaces
- Kubernetes volumes (PV & PVC)
- Ingress and Ingress Controller
- Ingress Domain Name based Routing with External DNS
- AWS Container Registry for AKS
- EKS Cluster Autoscaling
- EKS - Horizontal Pod Autoscaler (HPA)
- Kubernetes scheduling
- Kubernetes Services

■ Module 6: Kubeflow for Building ML Pipelines

- Kubeflow Introduction.
- Features
- Kubeflow Fairing.
- Kubeflow Pipelines.

■ Module 7: MLOps on Cloud

- Training ML models using Amazon SageMaker
- Amazon sage maker Notebook instances
- Creating, training and deploying ML Models with Sage maker.
- Exploring the Sage maker Studio and Domain Features.
- Utilizing Pipelines and Graphs in Sage maker.
- Configuring Endpoints in Sage maker.

■ Module 8: Feature Store

- What is a feature store
- Online vs offline features
- AWS SageMaker Feature Store
- Feast (open-source feature store)

■ Module 9: Model Deployment Strategies

- Model deployment on AWS SageMaker endpoints
- Alternatives: ECS / EKS / Lambda + API Gateway
- Blue-green & canary deployments
- Model registry and version management
- Model registry concepts
- Versioning
- Promotion rules (dev → staging → prod)
- Approval workflows
- Automated rollback
- Unit tests for ML code
- Data tests
- Model quality tests

■ Module 10: CI/CD for ML Pipelines

• CI/CD fundamentals for ML (CT, CD)
• AWS Code Pipeline + Code Build + Code Deploy
• Integrating GitHub Actions or GitLab CI with AWS
• Automating Docker image builds and model retraining
• Deploying updated models automatically

■ Module 11: Infrastructure as Code (IaC)

• Infrastructure as Code with Terraform
• Define ECR, EKS, S3, and SageMaker via IaC
• GitOps approach to managing infrastructure

■ Module 12: Monitoring and Model Governance

• Monitoring inference endpoints using CloudWatch
• Drift detection and retraining
• Logging & alerting for containerized ML models
• Model auditability and governance

■ Module 13: Advanced Topics

• Using Kubeflow or MLflow with AWS
• A/B testing models in production
• Multi-cloud and hybrid MLOps architectures
• Cost optimization strategies on AWS

Module 14: Capstone Project:

End-to-End MLOps Pipeline on AWS with Docker & EKS

- Data stored on S3
- Model training via SageMaker
- Containerized deployment on EKS
- CI/CD using Code Pipeline
- Monitoring via CloudWatch
- Drift detection + automated retraining

Deliverables:

- Architecture diagram
- Source code (GitHub)
- Live demo or recorded walkthrough