



Artificial Intelligence

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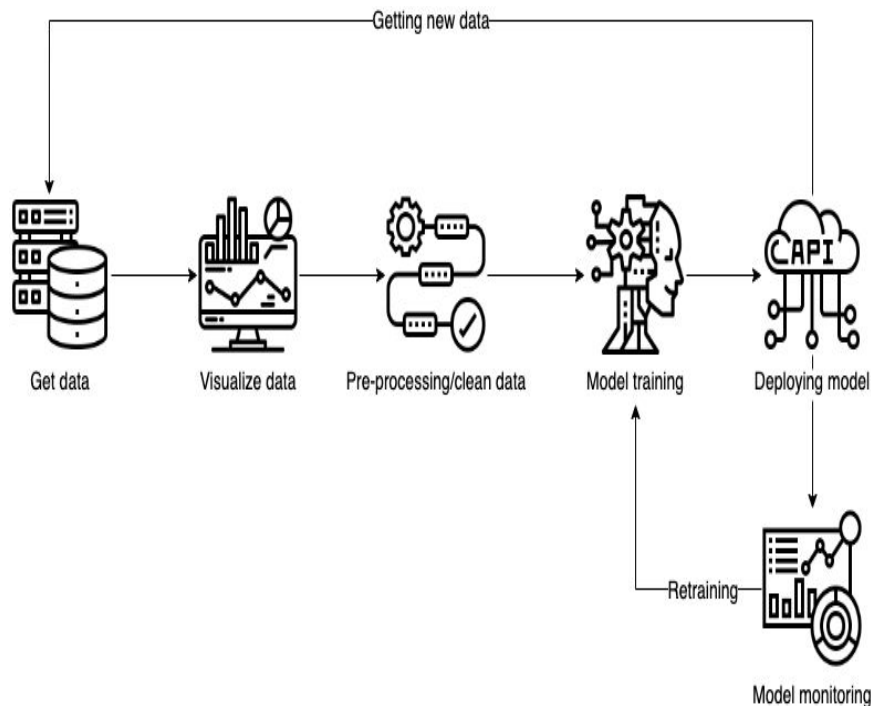


AI, ML, and MLOps

MLOps: Bridging ML and DevOps



What is MLOps?




MLOps: Bridging ML and DevOps

Definition: MLOps = Machine Learning + DevOps + Data Engineering.

Practices to automate, monitor, and manage ML workflows.

Why MLOps?

 **Reproducibility:** Track code, data, and models.

 **Scalability:** Deploy models to handle real-world demands.

 **Monitoring:** Detect model drift and performance decay.



MLOps Tools Overview

Tools for End-to-End ML Workflows



mlflow



Apache
Airflow

Tools for End-to-End ML Workflows

GitHub

Code version control & collaboration.

Example: "Merge feature-branch into main."

DVC (Data Version Control)

Track datasets like code.

Example: `dvc add data/raw` → `dvc push`.

DAGsHub

Unified platform for ML projects (Git + DVC + MLflow).

Example: Visualize experiments and data lineage.

Airflow

Orchestrate workflows with DAGs.

Example: Schedule daily model retraining.

MLflow

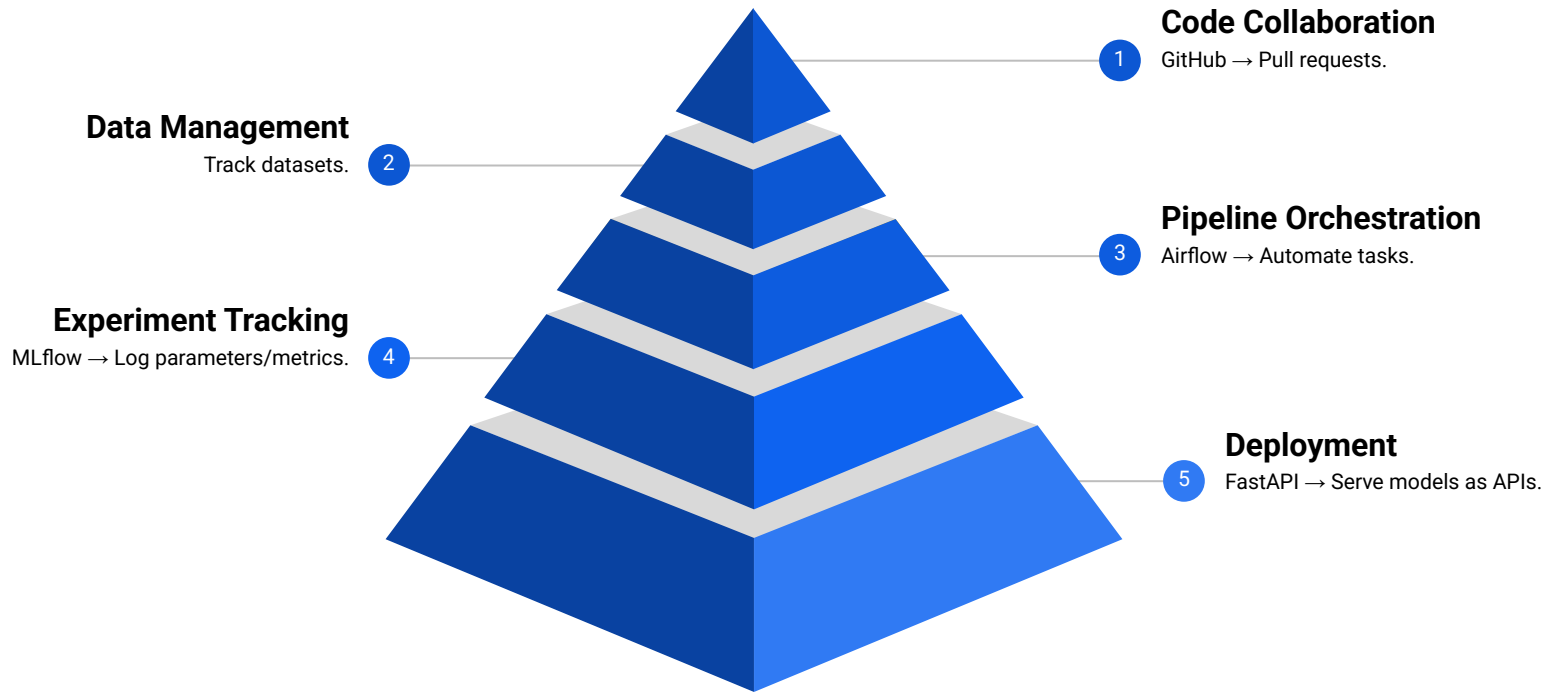
Experiment tracking, model registry, deployment.

Example: Log metrics with `mlflow.log_metric("accuracy", 0.95)`.



MLOps Tools in Action

How Tools Fit into the ML Lifecycle





Why MLOps Matters

The Impact of MLOps

<i>Without MLOps</i>		<i>With MLOps</i>	
Manual, error-prone	✗	✓	Automated pipelines
No experiment tracking	✗	✓	Reproducible workflows
Models fail in production	✗	✓	Scalable monitoring
Collaboration chaos	✗	✓	Git + DVC for teamwork

Any questions?