ML Ops

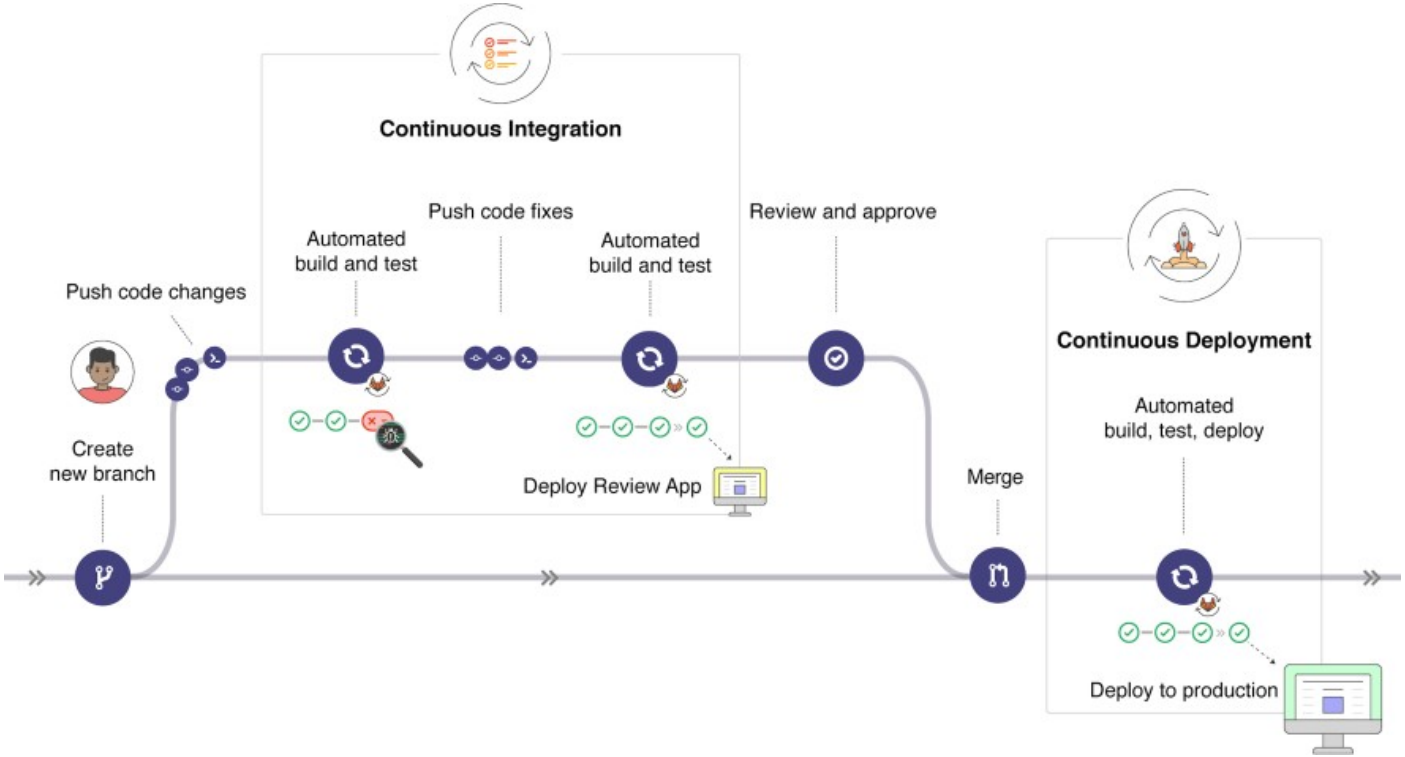
Professor Kartik Hosanagar

Agenda

- Overview of traditional DevOps
- Overview of machine learning workflow
- Challenges in CI/CD for ML
- Existing MLOps tools in the market

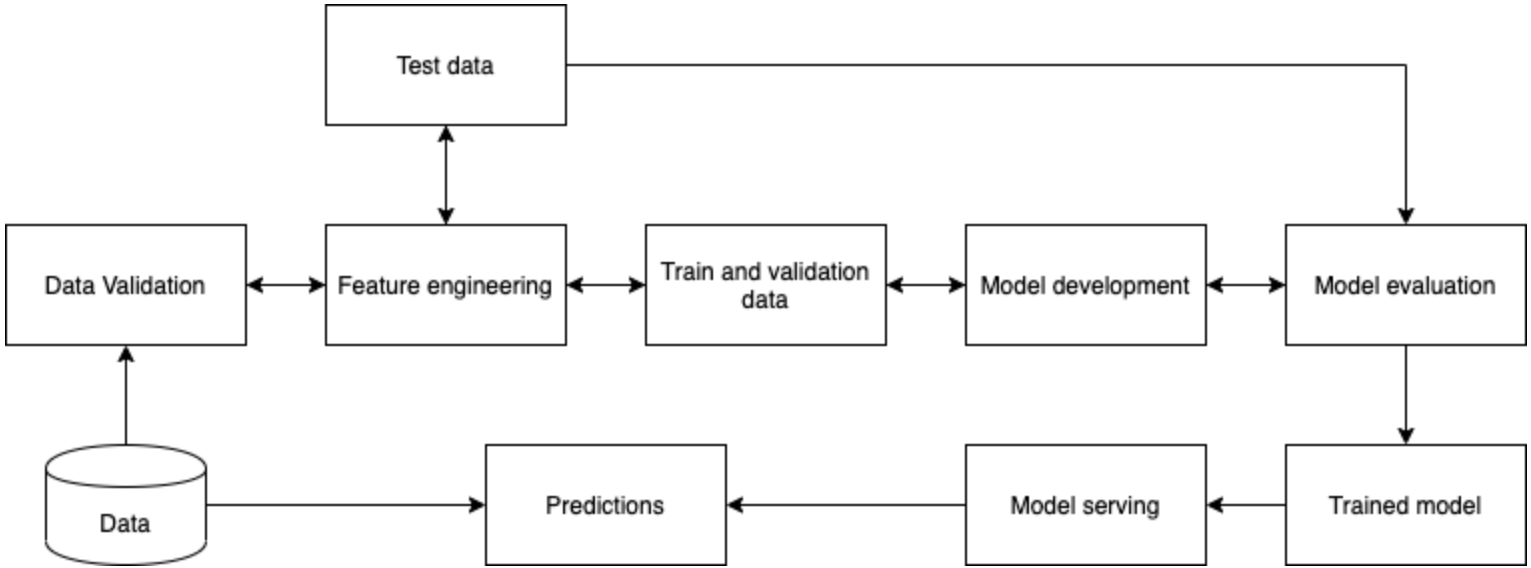
Traditional Dev Ops

Practices and tools used to build, test, and deploy code to production



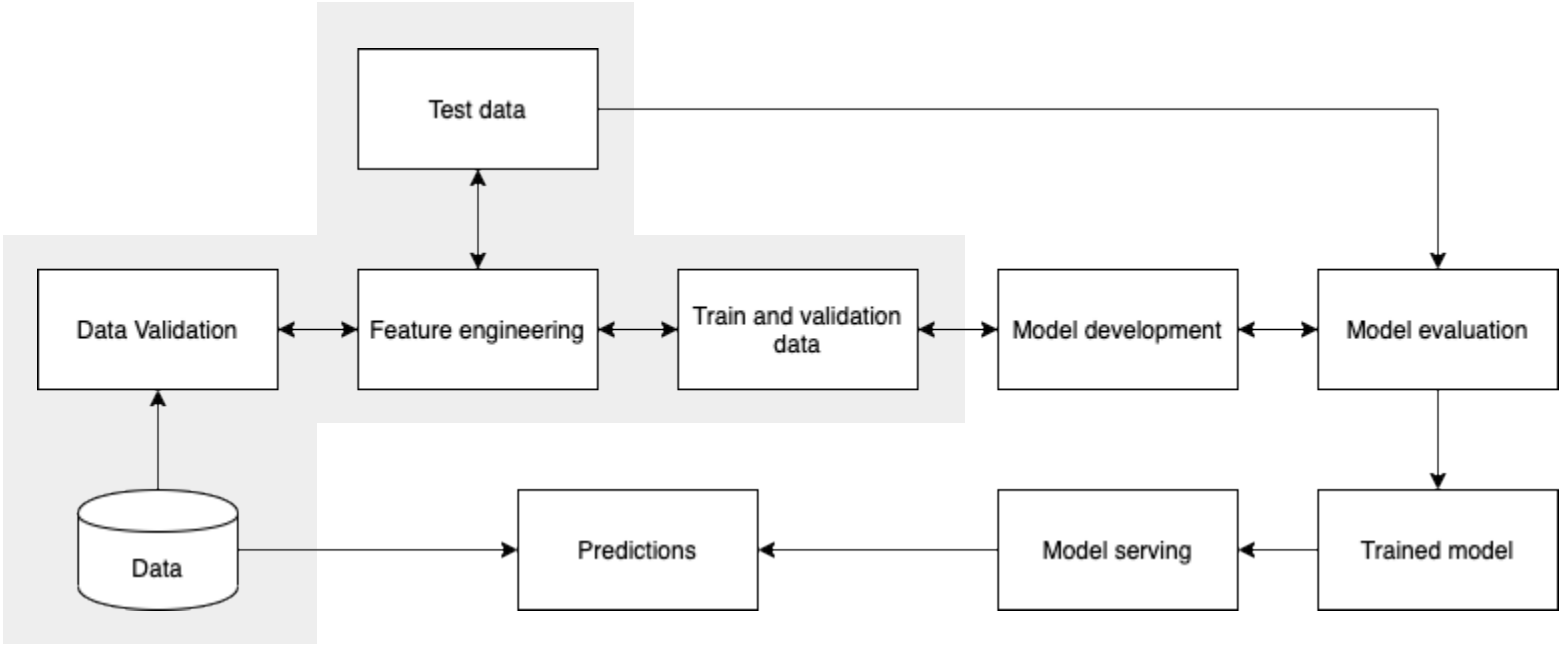
https://docs.gitlab.com/ee/ci/introduction/

Machine learning workflow



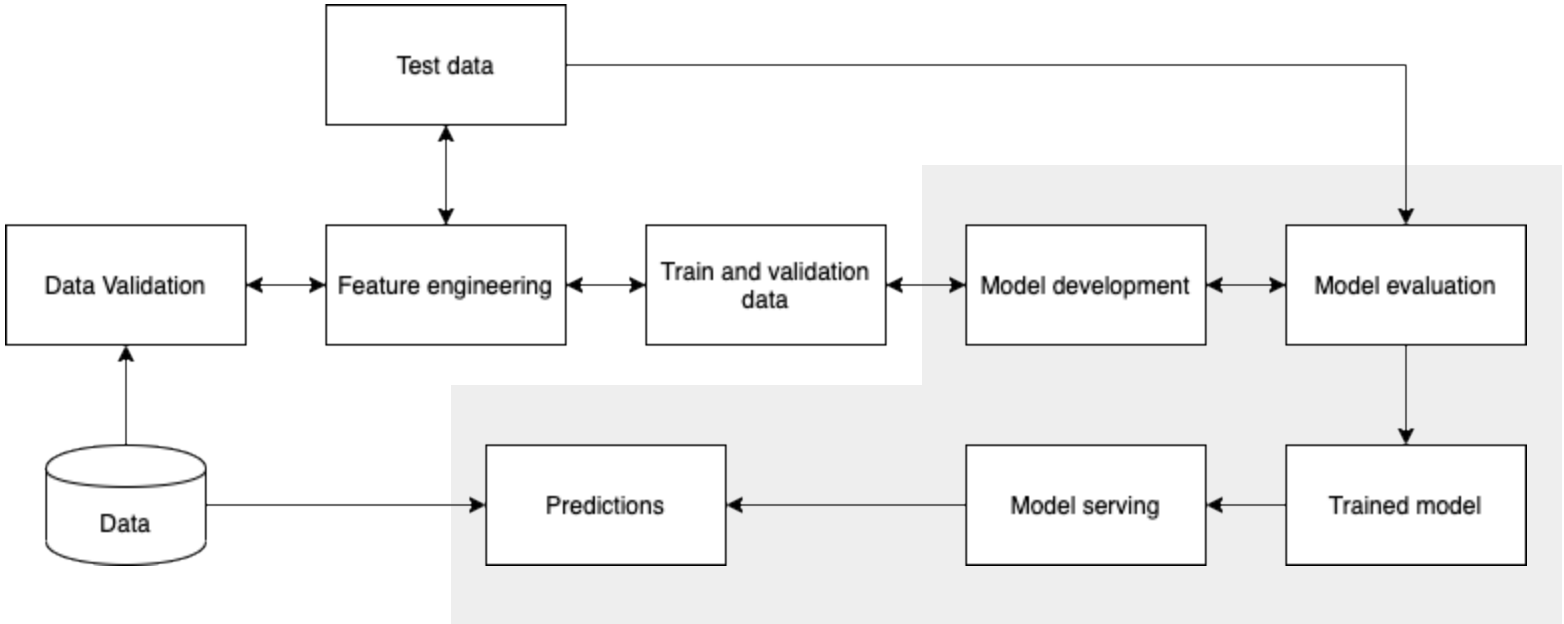
Challenges in ML Ops

Code is not the only variable - data can also change



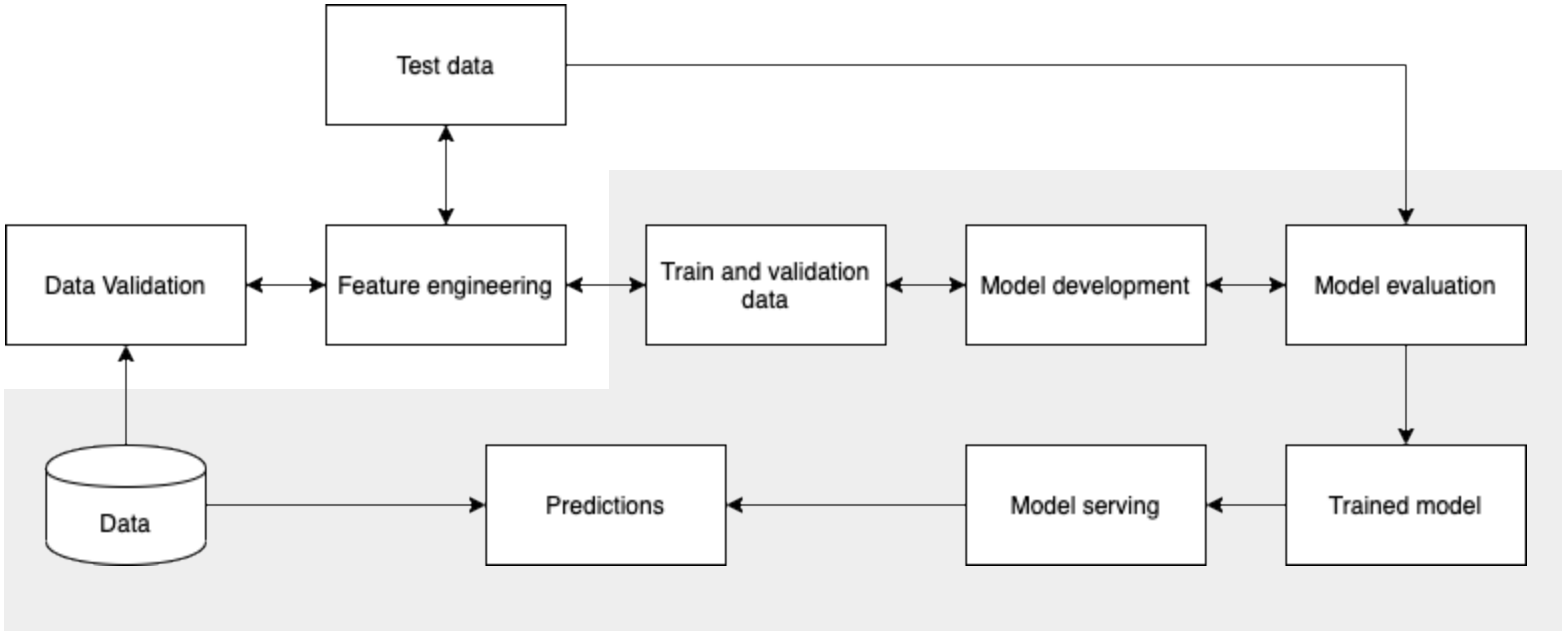
Challenges in ML Ops

Testing and performance monitoring become much more complex



Challenges in ML Ops

Computing resources may be heterogeneous (GPUs, TPUs, etc.)



Existing ML Ops Tools

Infrastructure Management → Data Management → Model Management → Deployment → Monitoring

End-to-End ML Platform

Amazon SageMaker

Paperspace

Data Gov. & Version Control

Pachyderm

Open Source Framework

mlflow

Kubeflow

Marketplace & Deployment

ALGORITHMIA

Existing ML Ops Tools

Infrastructure Management | Data Management | Model Management | Deployment | Monitoring

End-to-End ML Platform

Amazon SageMaker

Paperspace

Data Gov. & Version Control

Pachyderm

Open Source Framework

mlflow

Kubeflow

Marketplace & Deployment

ALGORITHMIA

Existing ML Ops Tools

Infrastructure Management | Data Management | Model Management | Deployment | Monitoring

End-to-End ML Platform

Amazon SageMaker

Paperspace

Data Gov. & Version Control

Pachyderm

Open Source Framework

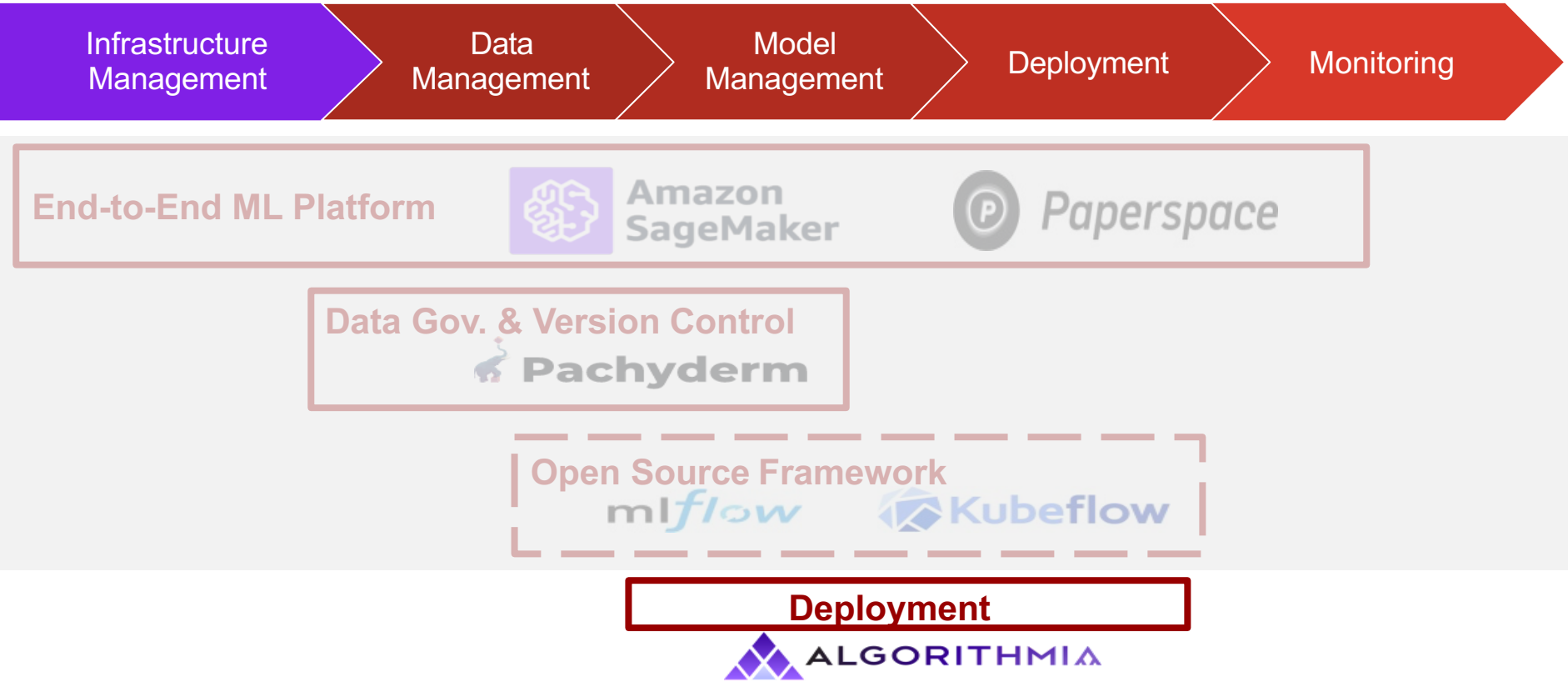
mlflow

Kubeflow

Marketplace & Deployment

ALGORITHMIA

Existing ML Ops Tools



Existing ML Ops Tools

Infrastructure Management → Data Management → Model Management → Deployment → Monitoring

End-to-End ML Platform

Amazon SageMaker

Paperspace

Data Gov. & Version Control

Pachyderm

Open Source Framework

mlflow

Kubeflow

Deployment

ALGORITHMIA

ML Workflow Landscape (2018)

https://medium.com/memory-leak/introducing-redpoints-ml-workflow-landscape-312ca3c91b2f