# Using Continuous Integration and Continuous Deployment

**Jared Rhodes**
INDEPENDENT CONSULTANT

@qimata www.jaredrhodes.com

# Overview

Versioning models

Data drift

Continuous deployment

Machine Learning Operations
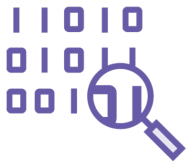
# Model Version Control

# Model Version Control
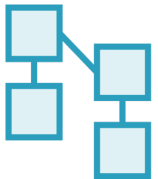
Version testing

Gated releases

Tracking models

# Version Testing
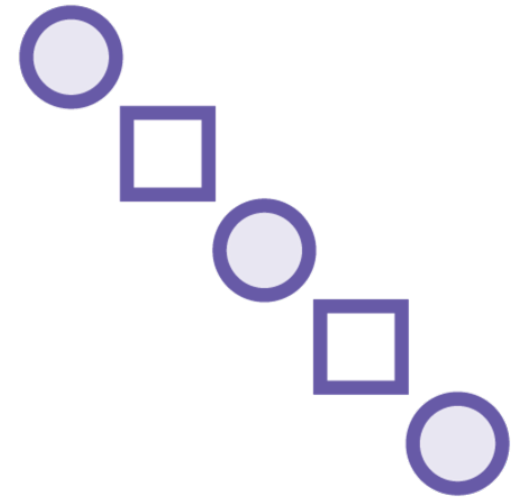
Collect data

Detect drift

Validate models

# Collecting Data

**Model Input**

**Performance**

**Model Predictions**

# Data Drift

Data drift is the change in model input data that leads to model performance degradation

# Monitoring

Drift coefficient

Contribution by feature

Distance metrics

Distributions of features

Send alerts

# Drift Calculation

Baseline dataset

Model input
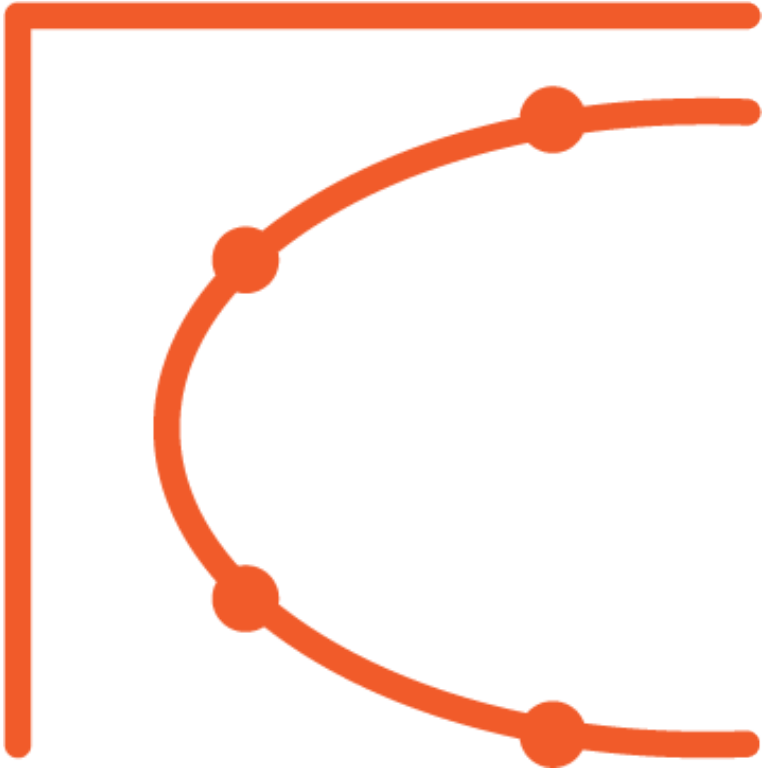
Profiled datasets

Drift coefficient

# Validate Models



**Investigate**

**Split**

**Train**

**Evaluate**

**Deploy**

# Continuous Deployment

# Continuous Deployment

**Azure DevOps**

**MLOps**

# Continuous Deployment

Continuous deployment is a software engineering approach in which teams produce software in short cycles, ensuring that the software can be reliably released at any time and, when releasing the software, doing so manually

# Azure DevOps

Azure DevOps provides developer services to support teams to plan work, collaborate on code development, and build and deploy applications

Azure DevOps supports Azure Machine Learning

# Machine Learning Operations
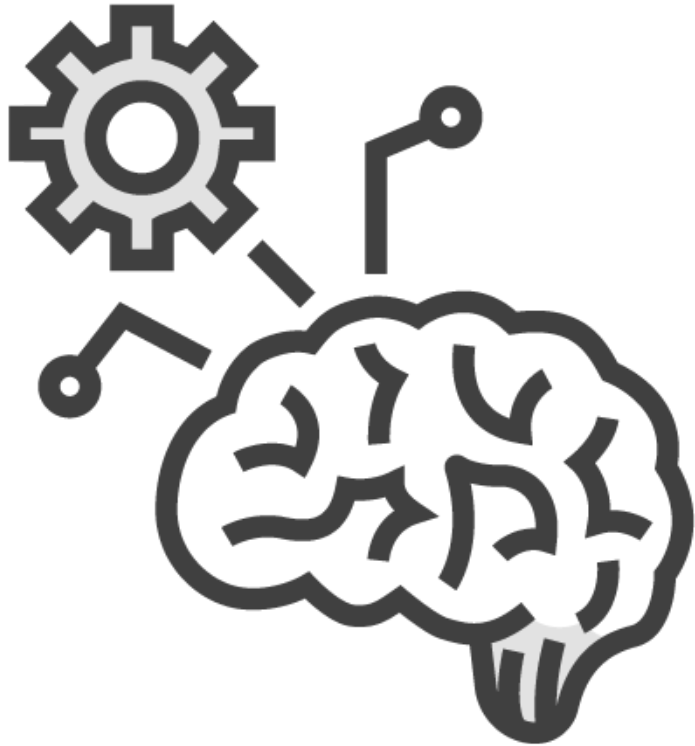
Deploy from anywhere

Monitor ML applications

Capture data

Automate end to end

# Automation

Git

Check in

Retrain

Evaluate

Deploy

# Azure Machine Learning Extension

**Workspace selection**

**Triggered by trained models**

# Demo

Create an Azure DevOps Account

Create an ML Pipeline

# Review

- Versioning models

- Data drift

- Continuous deployment

- Machine Learning Operations