Microsoft

Partner Training

Azure Machine Learning – Build models easily, scale flexibly and deploy anywhere

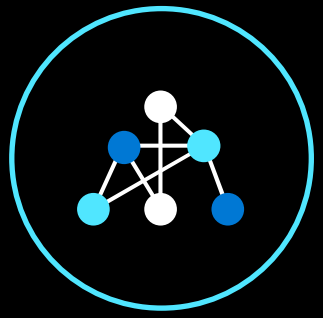
Kris Bock

https://aka.ms/aml2020

Azure AI

AI apps & agents

Knowledge mining



Machine learning

Machine Learning on Azure

Domain specific pretrained models
To simplify solution development


Vision


Speech


Language


Web search


Decision

Familiar data science tools
To simplify model development


Visual Studio Code


Azure Notebooks

Jupyter


Command line

Popular frameworks
To build advanced deep learning solutions


PyTorch


TensorFlow

Scikit-Learn


ONNX

Productive services
To empower data science and development teams


Azure Machine Learning

Azure Databricks


Machine Learning VMs

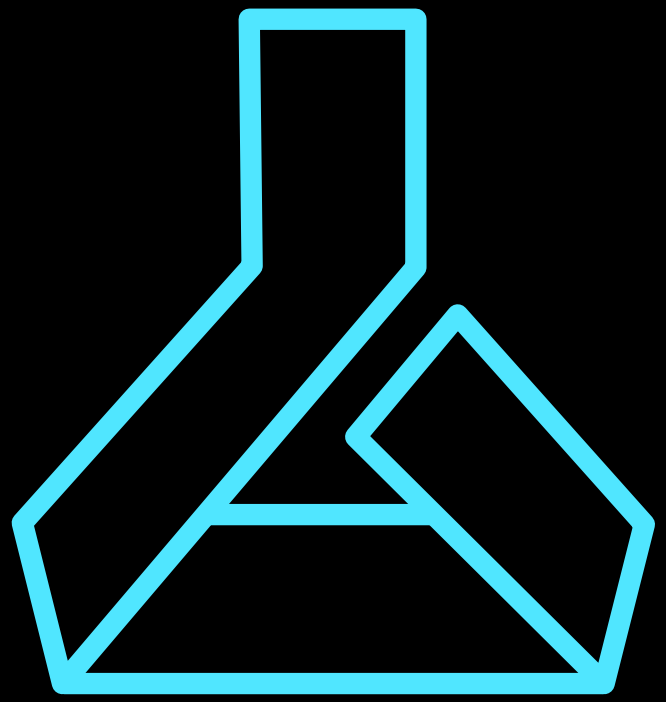
Powerful infrastructure
To accelerate deep learning


CPU


GPU


FPGA

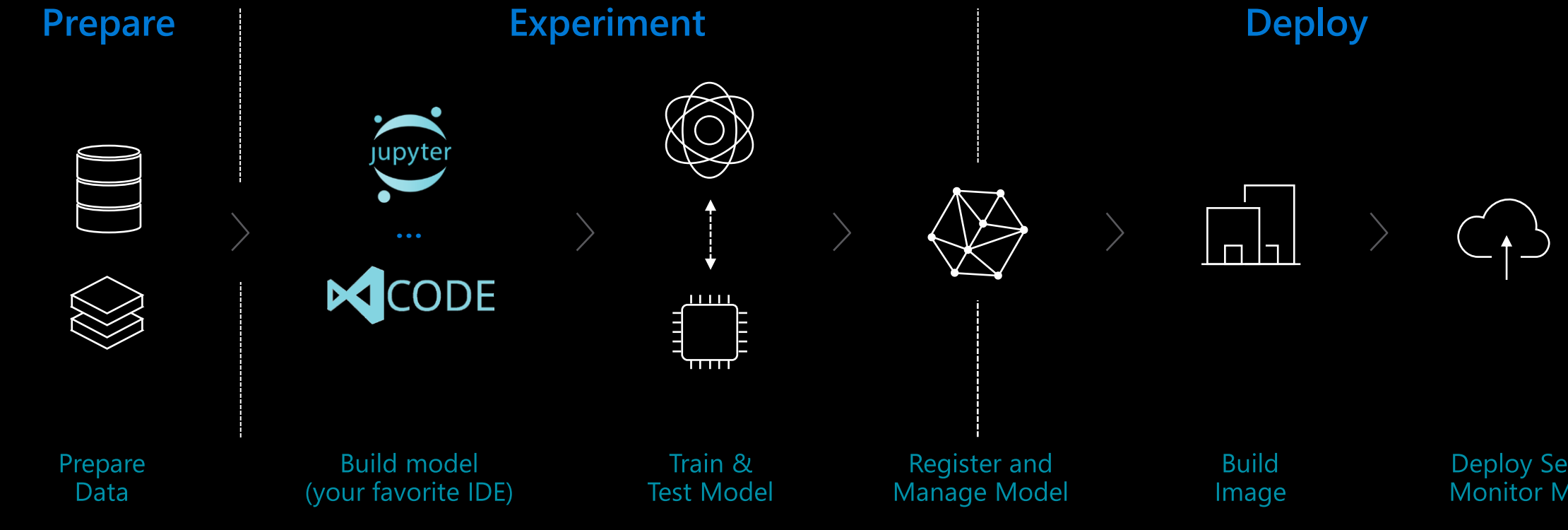

From the Intelligent Cloud to the Intelligent Edge

Azure Machine Learning

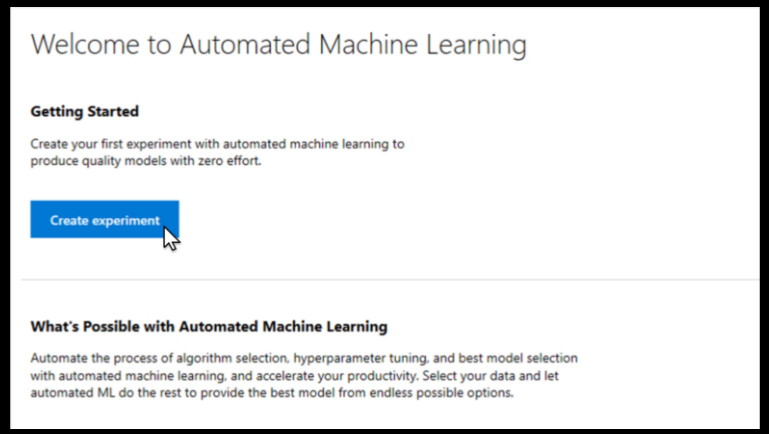
Machine Learning

Typical E2E Process

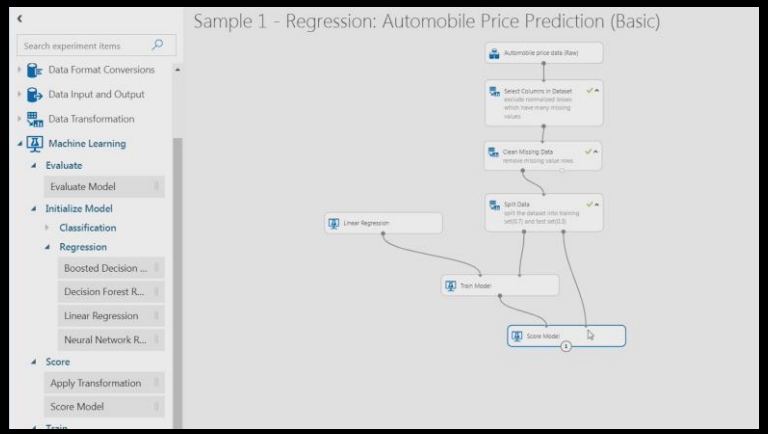


Productive machine learning

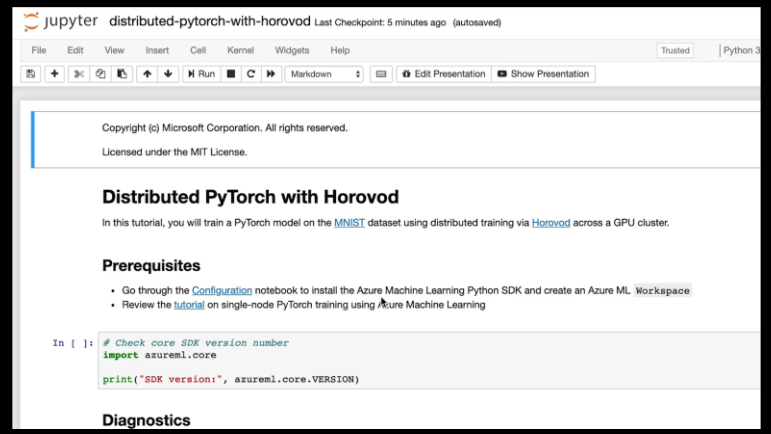
Capabilities in Azure Machine Learning service



Automated machine learning UI

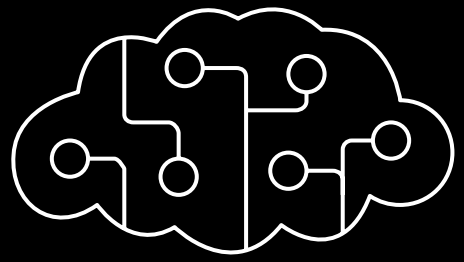


Visual interface



Machine learning notebooks

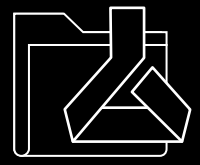
Centralized model registry



Azure Machine Learning: Technical Details

Azure ML service

Key Artifacts

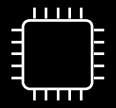


Workspace

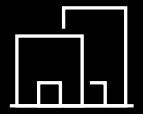
Models

Experiments

Pipelines



Compute Target



Images

Deployment

Data Stores

Azure ML service Artifacts

Models and Model Registry

Model

A machine learning model is an artifact that is created by your training process. You use a model to get predictions on new data.

A model is produced by a **run** in Azure Machine Learning.

> Note: You can also use a model trained outside of Azure Machine Learning.

Azure Machine Learning service is framework agnostic — you can use any popular machine learning framework when creating a model.

A model can be registered under an Azure Machine Learning service workspace

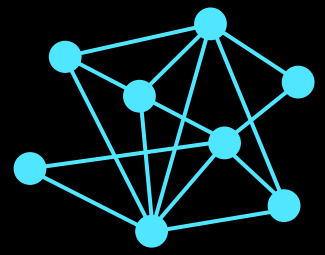
Model Registry

Keeps track of all the models in your Azure Machine Learning service workspace.

Models are identified by name and version.

You can provide additional metadata tags when you register the model, and then use these tags when searching for models.

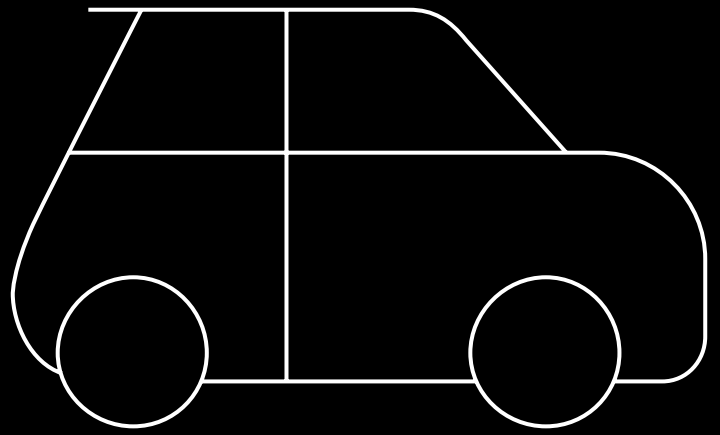
You cannot delete models that are being used by an image.



Automated machine learning

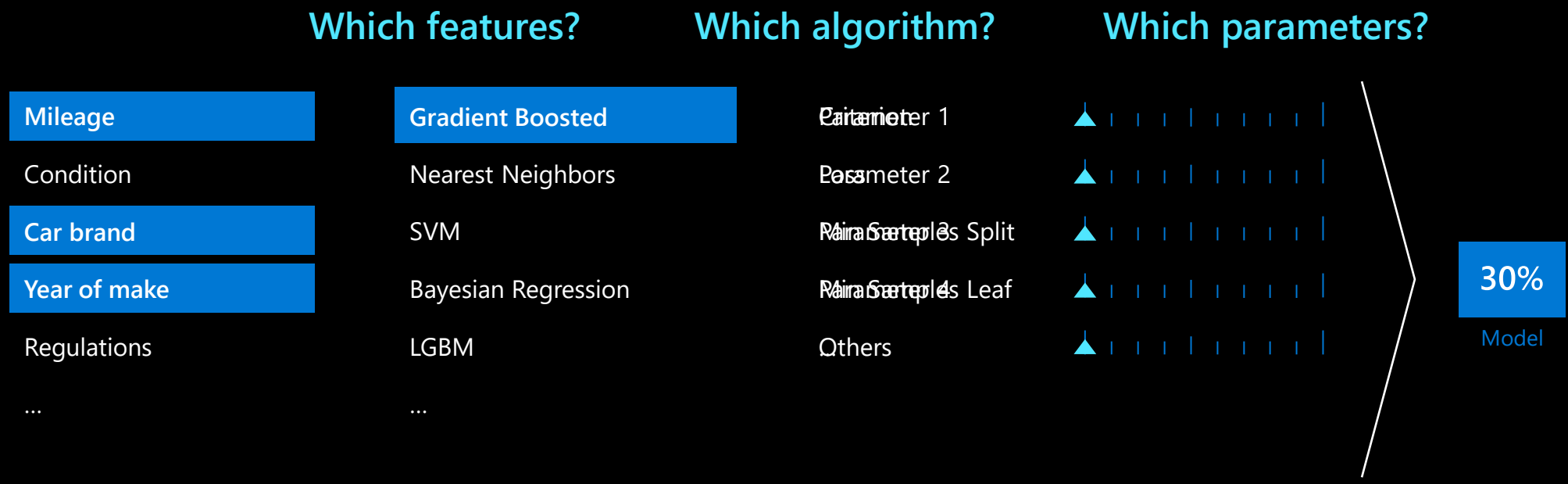
Azure Machine Learning

Automated machine learning



How much is this car worth?

Model creation is typically a time consuming process



Model creation is typically a time consuming process

Which features?

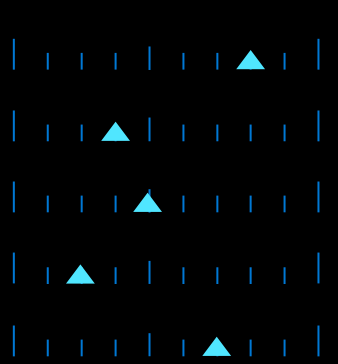
- Mileage
- Condition
- Car brand
- Year of make
- Regulations
- ...

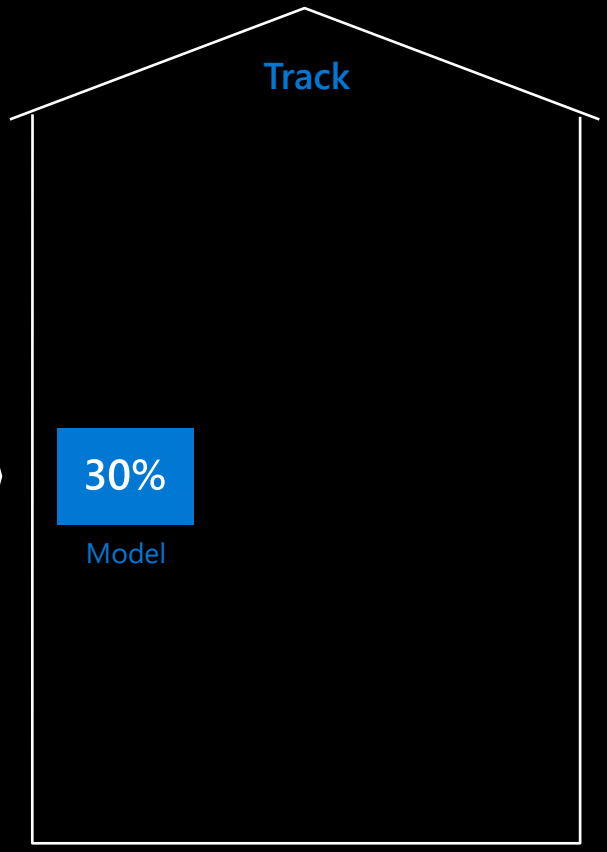
Which algorithm?

- Gradient Boosted
- Nearest Neighbors
- SGD
- Bayesian Regression
- LGBM
- ...

Which parameters?

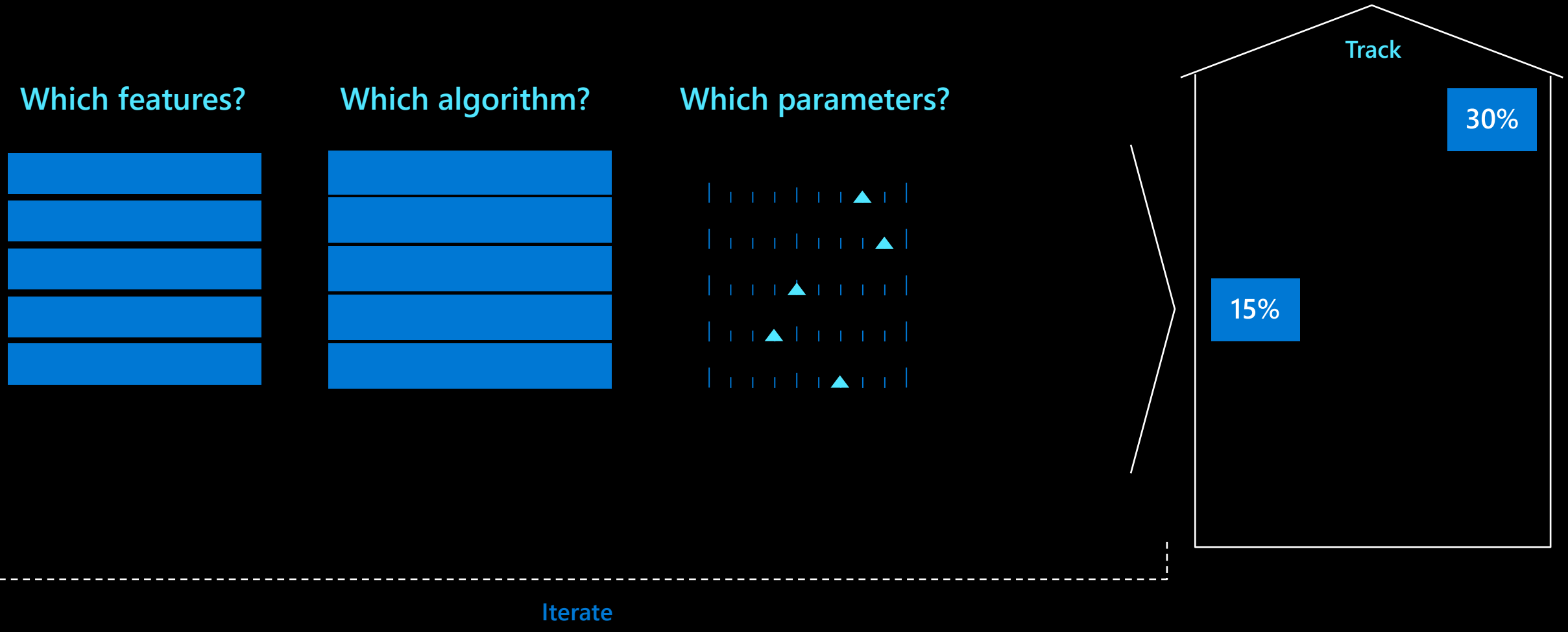
- N Neighbors
- Weights
- Metric
- Min Samples Split
- Min Samples Leaf
- ZYX



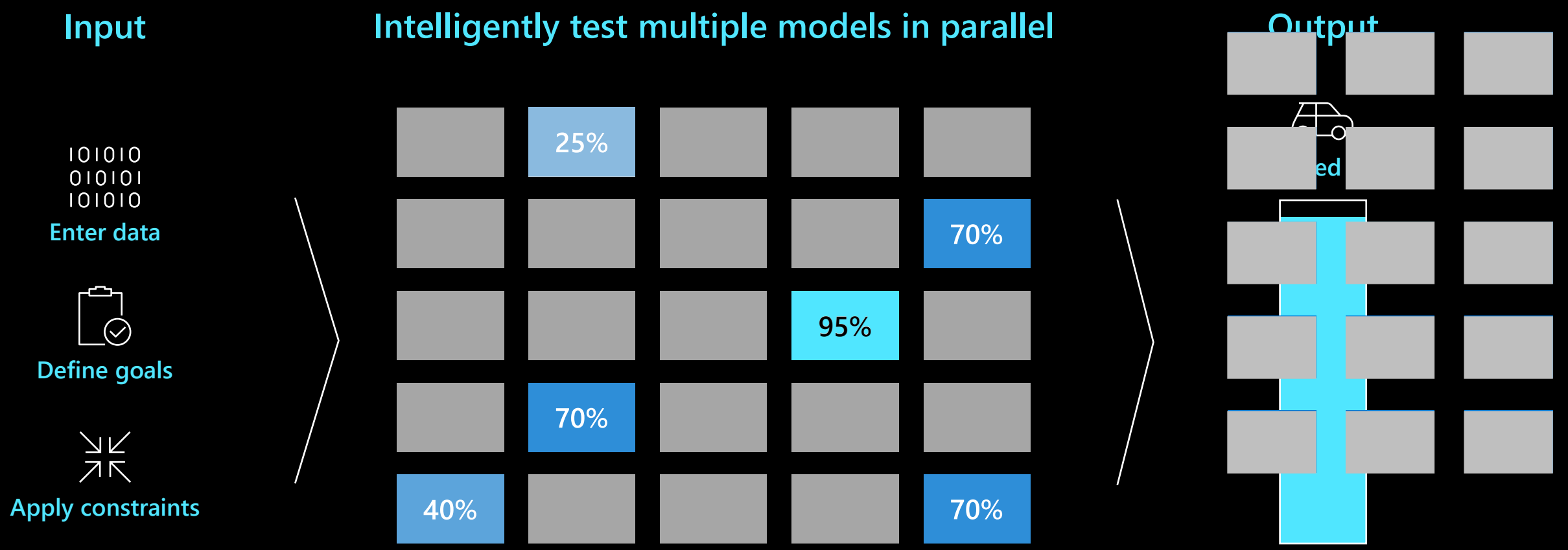


Iterate

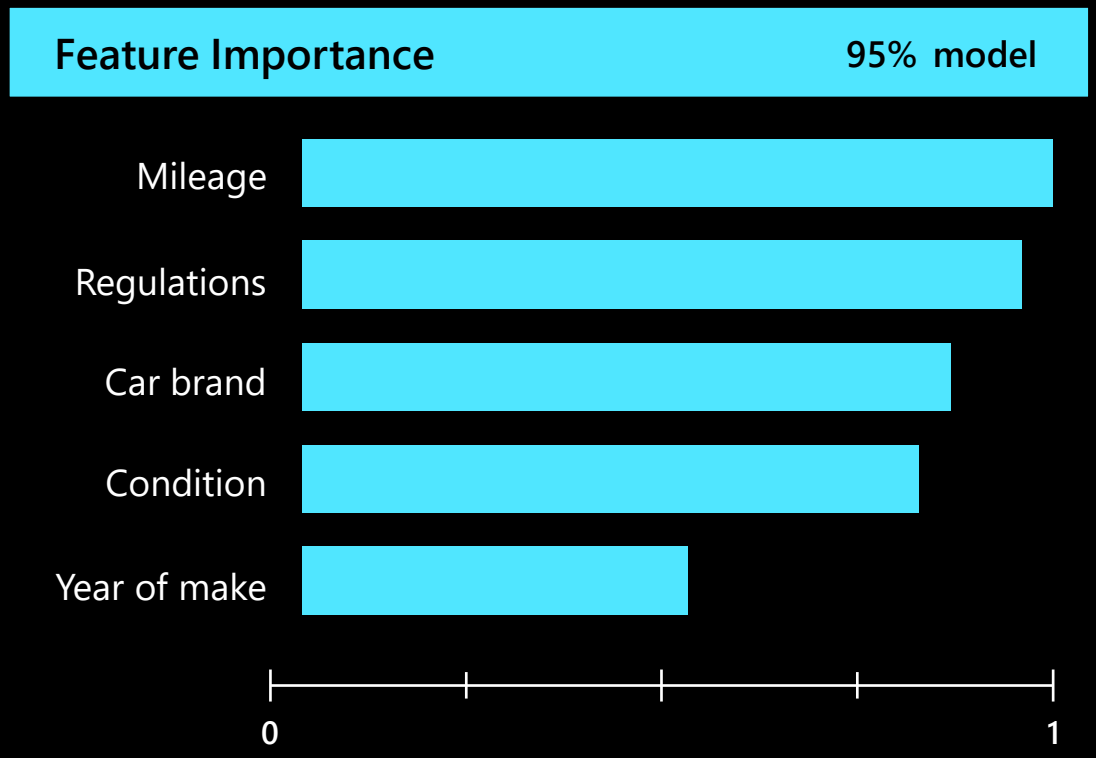
Model creation is typically a time consuming process

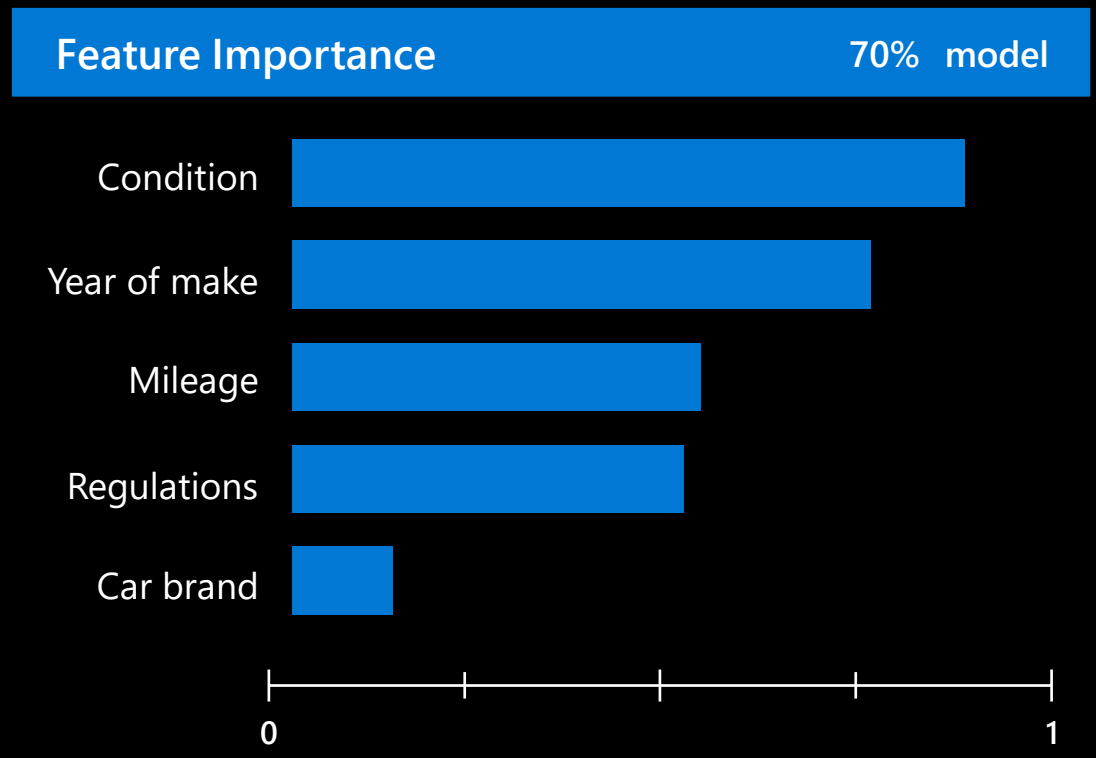


Automated Machine Learning accelerates model development

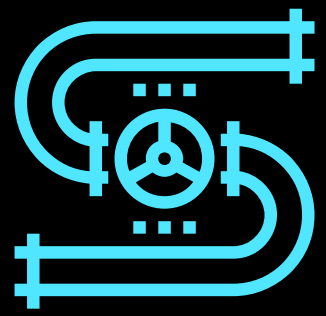


Understand the inner workings of ML by analyzing feature importance



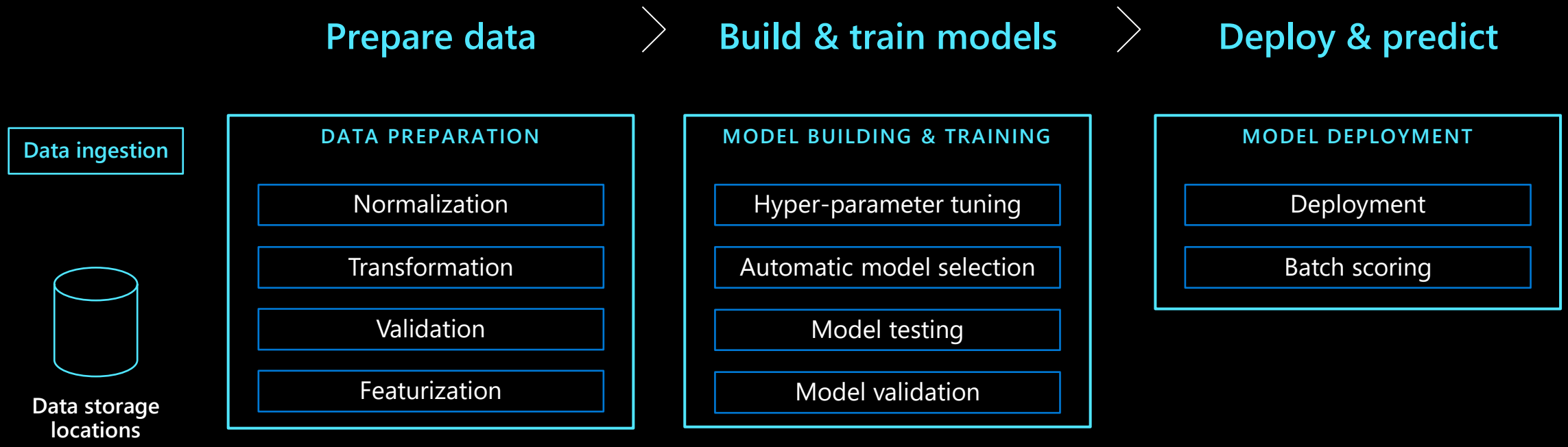


Enable model explain-ability for every automated ML iteration, not just the optimal model

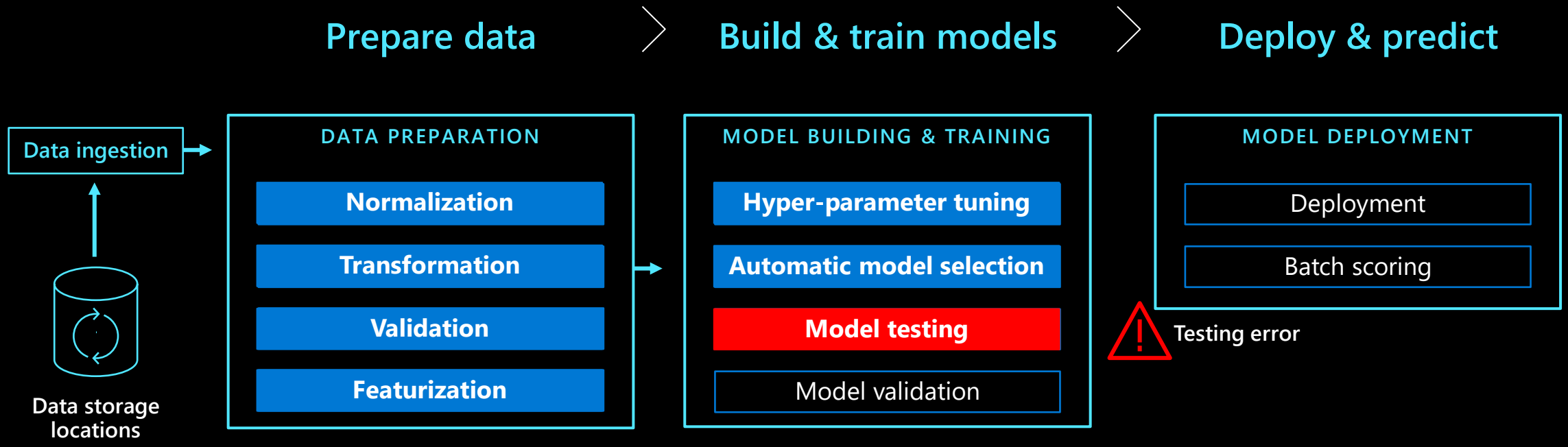


Azure Machine Learning pipelines

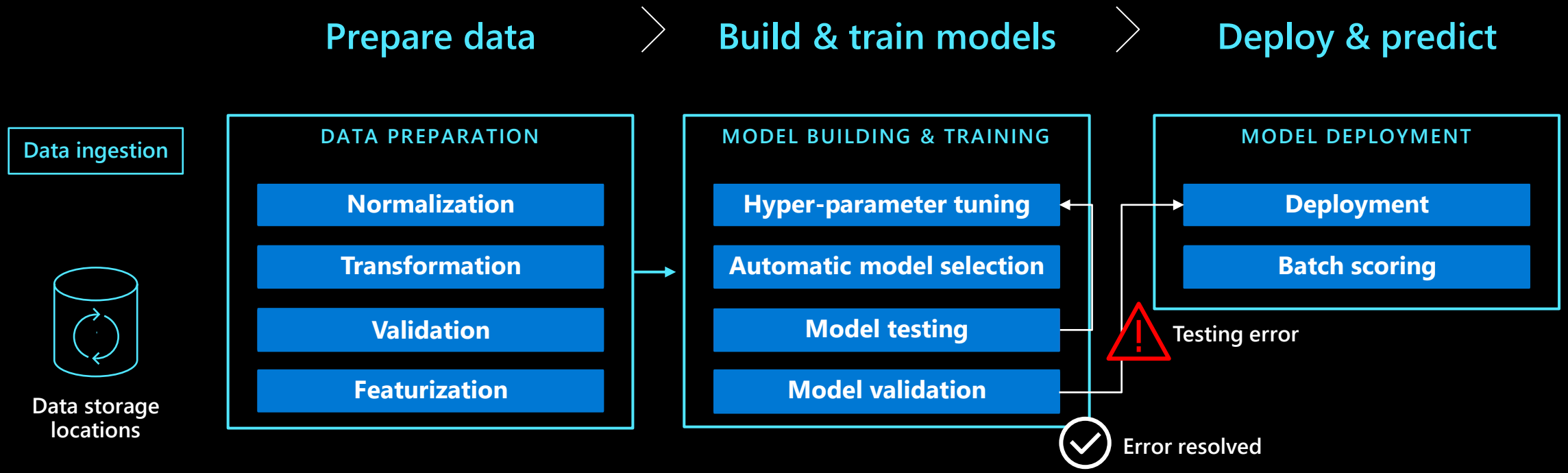
Azure Machine Learning pipelines



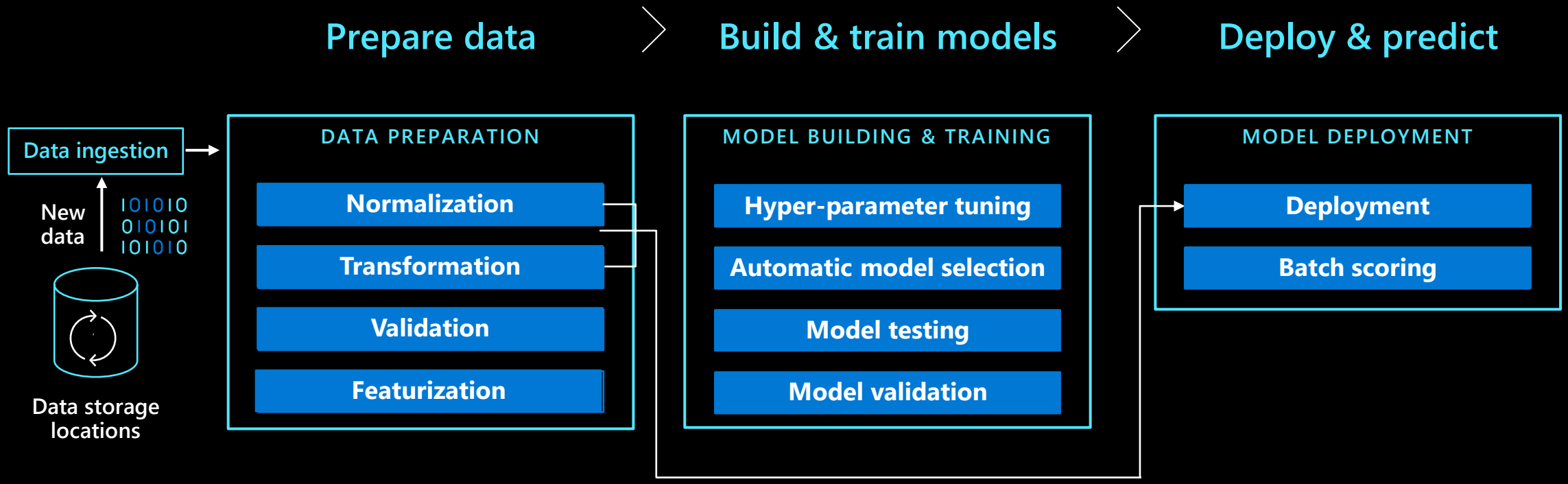
Azure Machine Learning pipelines



Azure Machine Learning pipelines



Azure Machine Learning pipelines with new data



Advantages of Azure ML Pipelines

Unattended runs

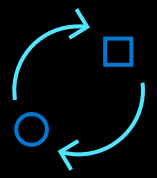
Schedule a few steps to run in parallel or in sequence to focus on other tasks while your pipeline runs

Tracking and versioning

Name and version your data sources, inputs and outputs with the pipelines SDK

Reusability

Create templates of pipelines for specific scenarios such as retraining and batch scoring



Mixed and diverse compute

Use multiple pipelines that are reliably coordinated across heterogeneous and scalable computes and storages

Microsoft

MLOps – DevOps for ML

DevOps

Code reproducibility

Code testing

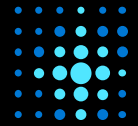
App deployment

MLOps

Model reproducibility

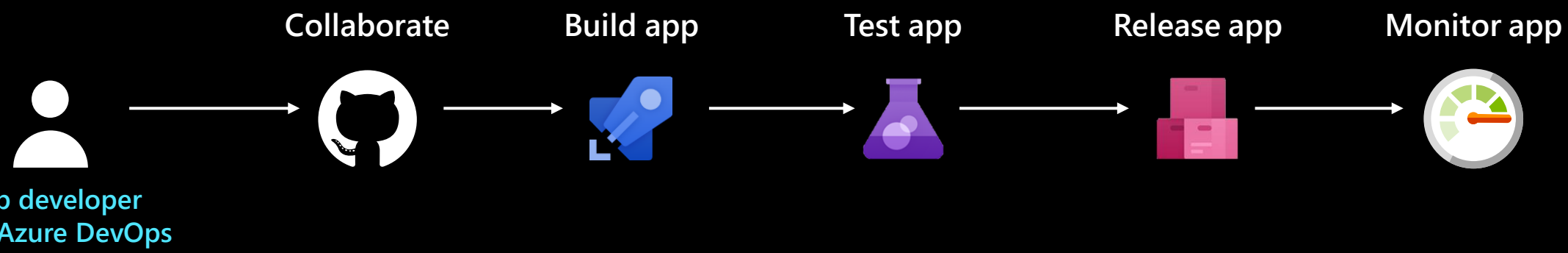
Model validation

Model deployment



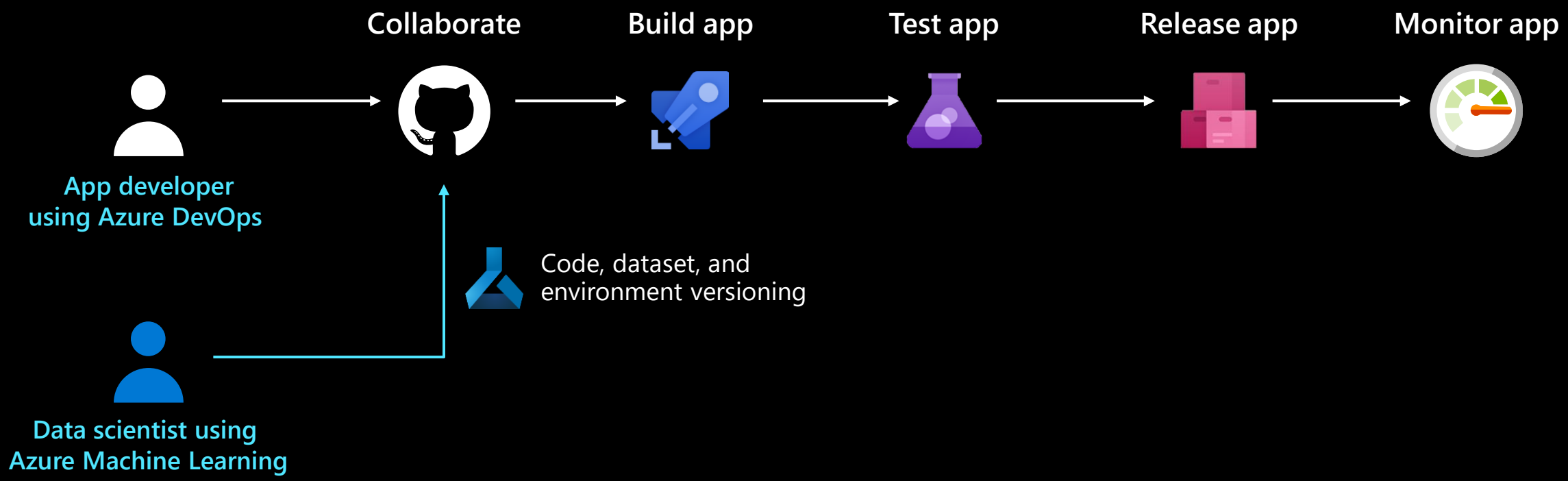
Model retraining

MLOps with Azure Machine Learning



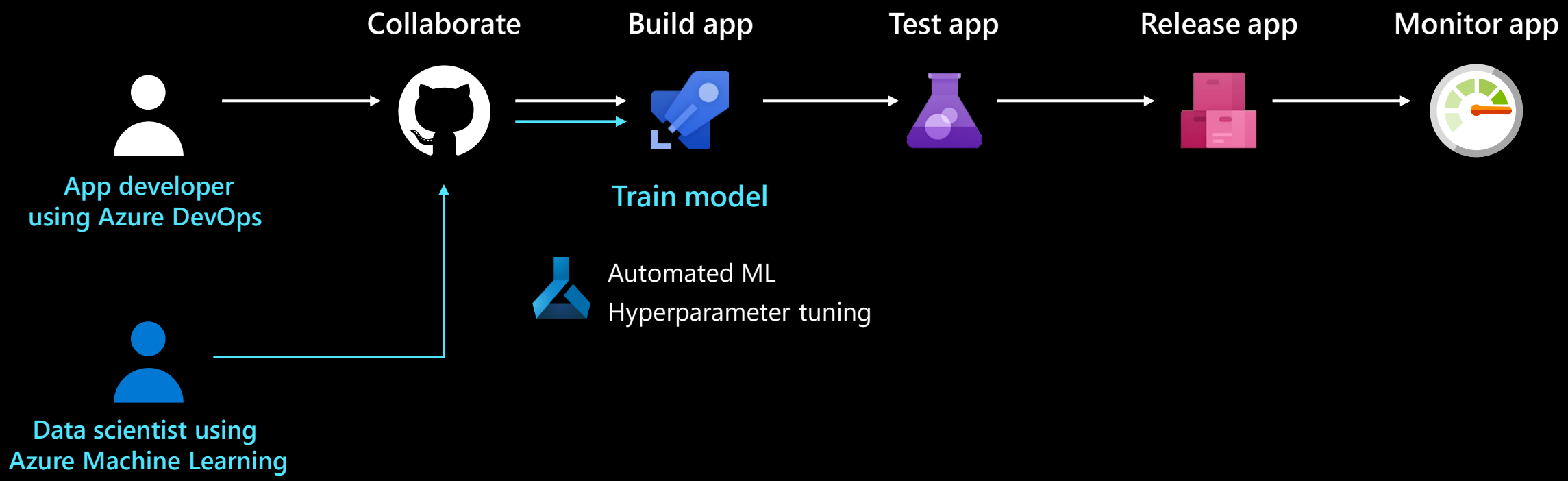
- Model reproducibility
- Model validation
- Model deployment
- Model retraining

MLOps with Azure Machine Learning



- [x] Model reproducibility
- [ ] Model validation
- [ ] Model deployment
- [ ] Model retraining

MLOps with Azure Machine Learning



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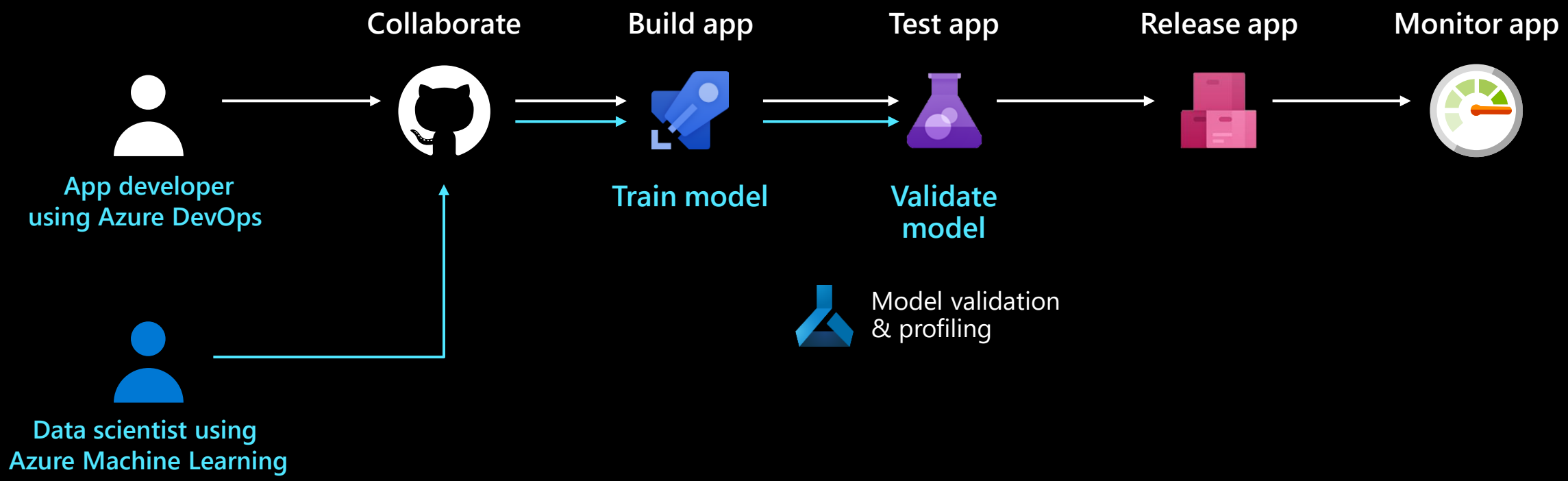
MLOps with Azure Machine Learning



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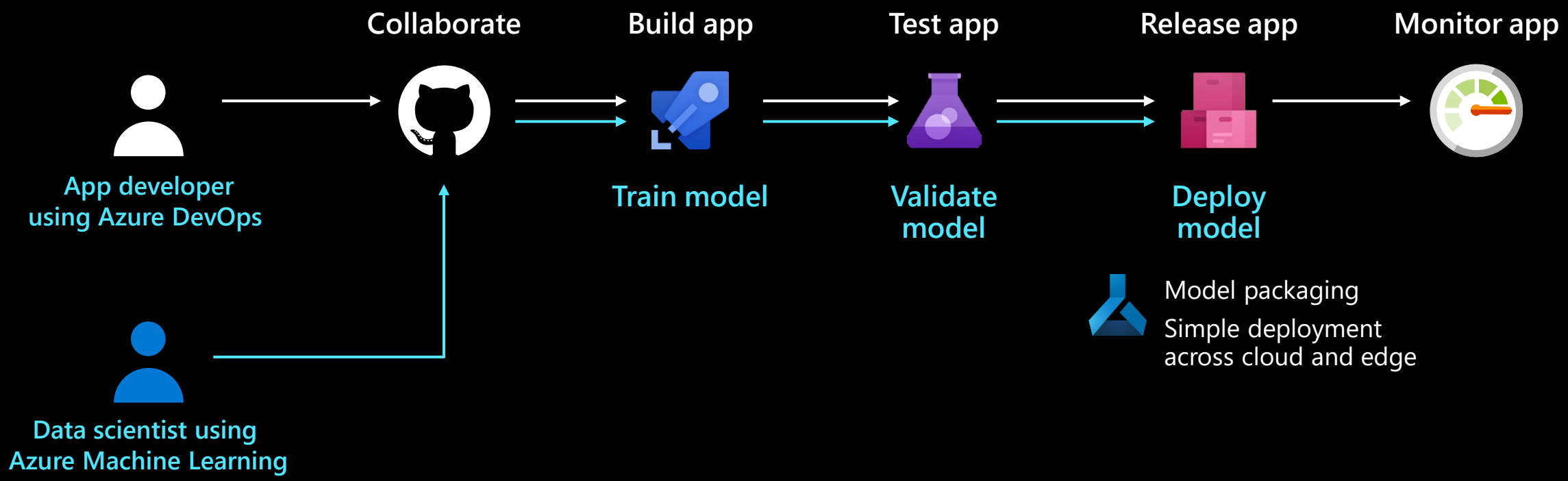
MLOps with Azure Machine Learning



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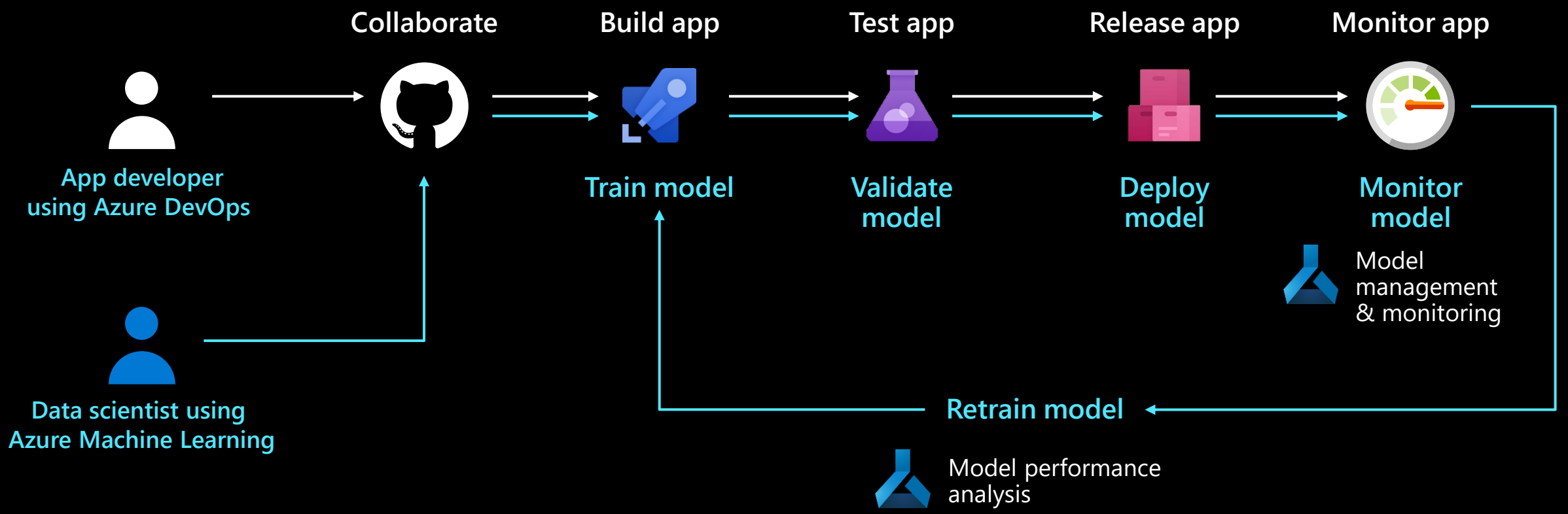
MLOps with Azure Machine Learning



- Model reproducibility
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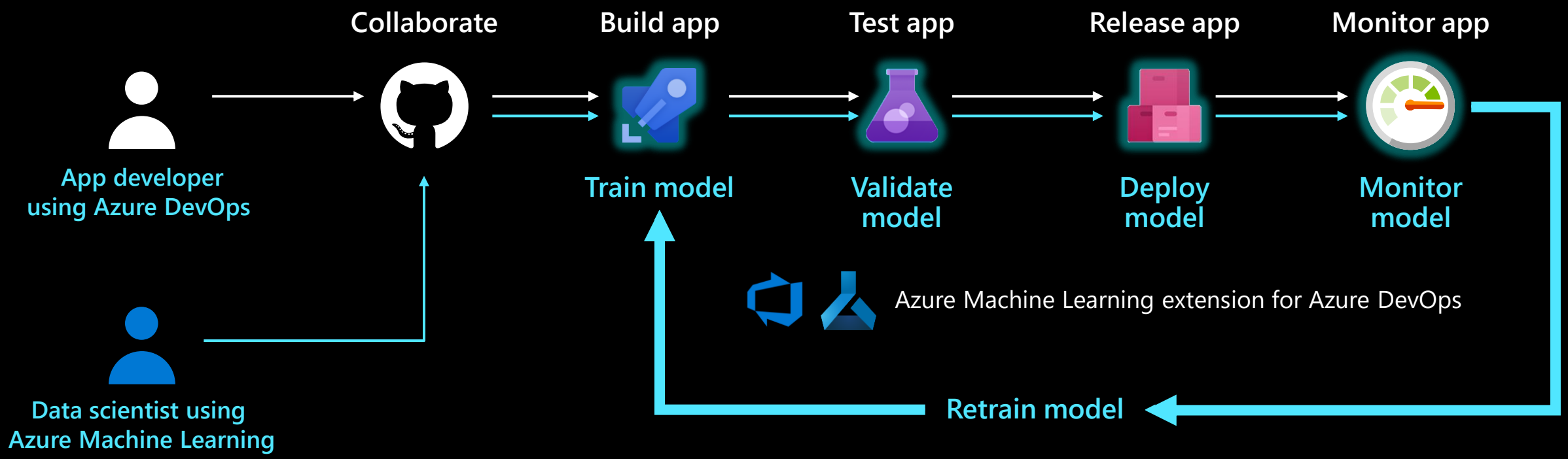
MLOps with Azure Machine Learning



- Model reproducibility
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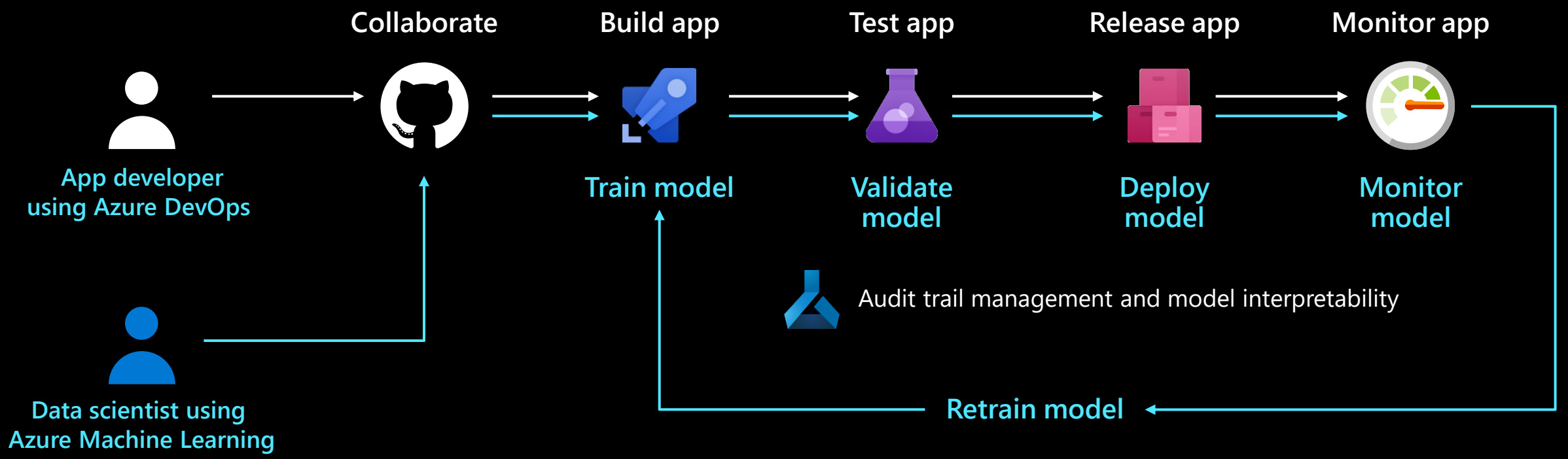
MLOps with Azure Machine Learning



- Model reproducibility
- Model validation
- Model deployment
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Thank You!