Microsoft

Azure ML service workshop

Lundi 25 novembre 2019

Vos interlocuteurs

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Azure AI Overview:
Machine Learning options in Azure

54+

Azure regions worldwide

>90

Compliance certifications

Machine Learning on Azure

Domain specific pretrained models
To simplify solution development


Vision


Speech


Language


Search

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 Databricks


Azure Machine Learning


Machine Learning VMs

Powerful infrastructure
To accelerate deep learning


CPU


GPU


FPGA


From the Intelligent Cloud to the Intelligent Edge

Azure Cognitive Services

Azure Cognitive Services

Deploy and run as a cloud service or anywhere as a container

5B

transactions a month

Vision

Speech

Web Search

Language

Decision

Sophisticated pretrained models

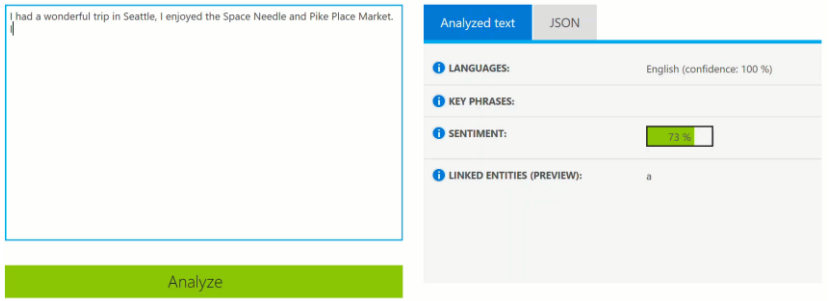
Infuse apps with powerful, pre-trained AI models

Customize easily and tailor to your needs

Vision

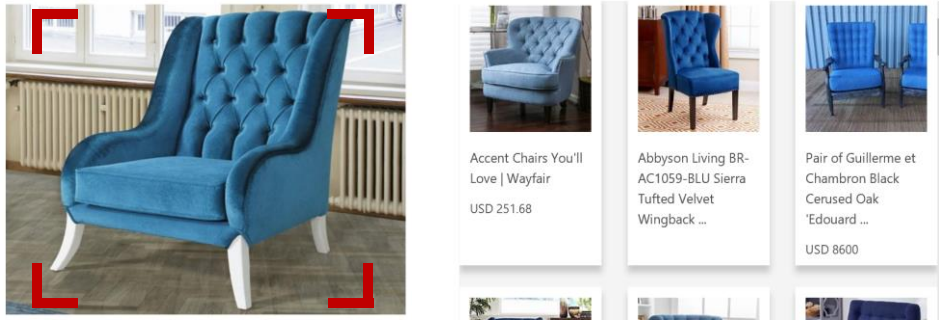
Computer Vision | Video Indexer | Face | Content Moderator

Language



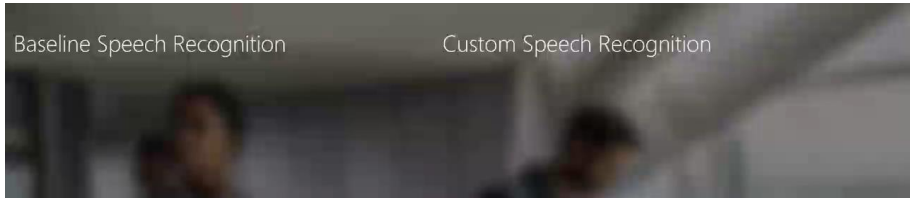
Text Analytics | Spell Check | Language Understanding | Text Translation | QnA Maker

Bing Search



Big Web Search | Video Search | Image Search | Visual Search | Entity Search | News Search | Autosuggest

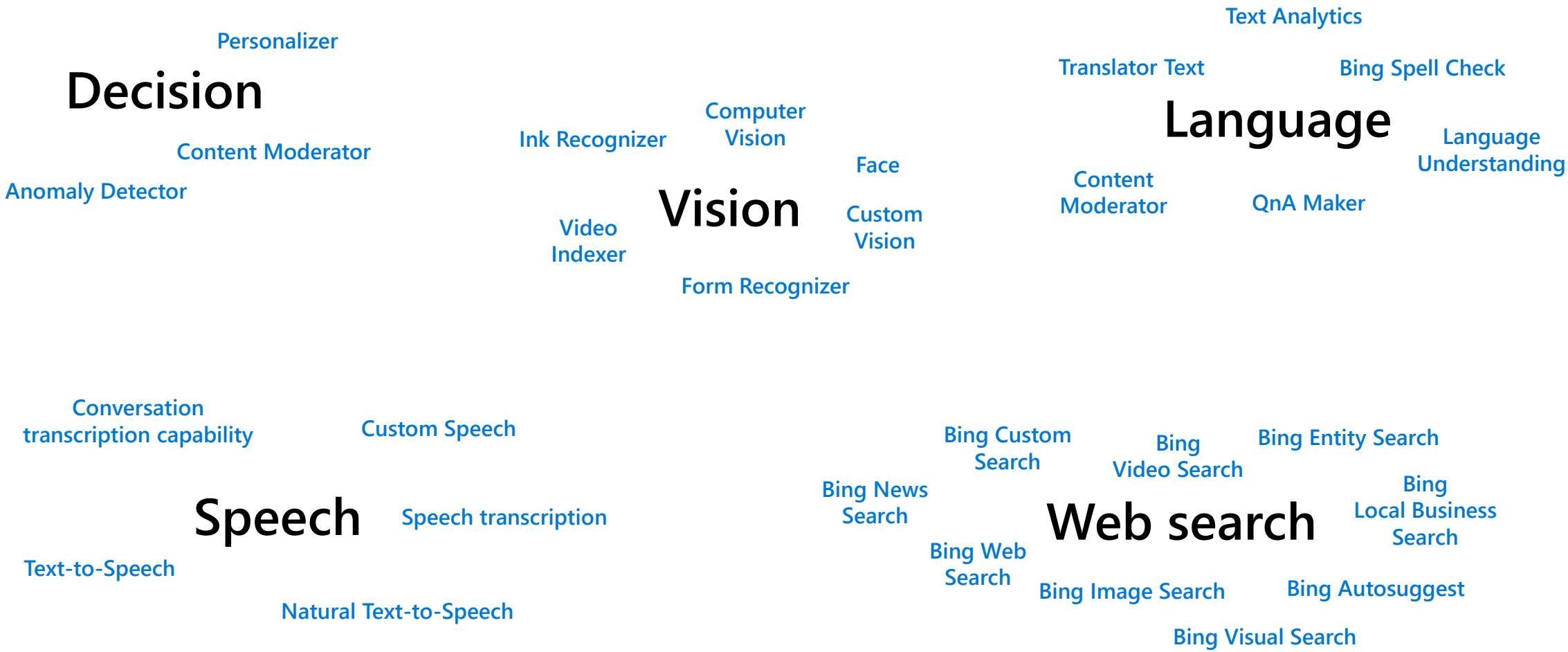
Speech



Speech to Text | Text to Speech | Speech Translation | Speaker Recognition

Azure Cognitive Services

The most comprehensive pre-trained AI

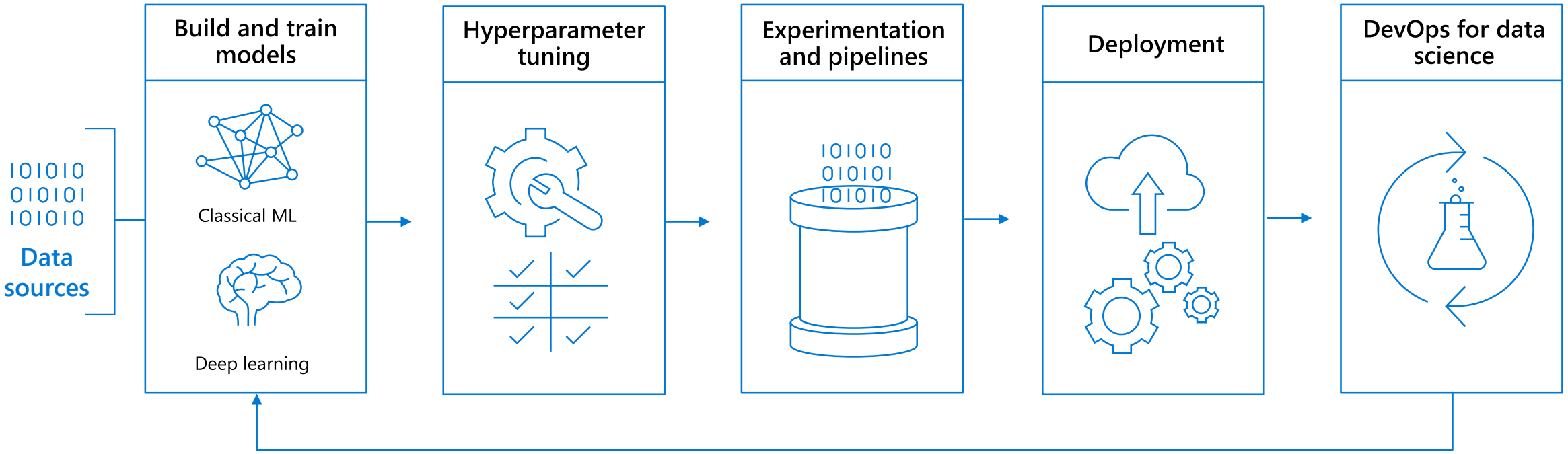


Azure ML Service Technical Overview

Azure Machine Learning service

https://docs.microsoft.com/en-us/azure/machine-learning/

Building blocks for a Data Science Project



Azure Machine Learning service

Set of Azure Cloud Services

Python SDK & R

That enables you to:

- ✓ Prepare Data
- ✓ Build Models
- ✓ Train Models
- ✓ Manage Models
- ✓ Track Experiments
- ✓ Deploy Models

Composants Azure ML service

Azure Machine Learning components

Experience
SDK, Notebooks, Drag-n-drop, Wizard

MLOps
Reproducible, Automatable, GitHub, CLI, REST

Datasets
Profiling, Drift, Labeling

Training
Experiments, Runs

Model Registry
Models, Images

Inferencing
Batch, Realtime

Compute
Jobs, Clusters, Instances

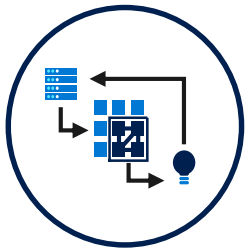
Azure IoT Edge
Security, Mgmt., Deployment

Cloud
CPU, GPU, FPGA

Edge
CPU, GPU, NPU

Azure Machine Learning

For all skill levels



Industry leading MLOps

Open & Interoperable

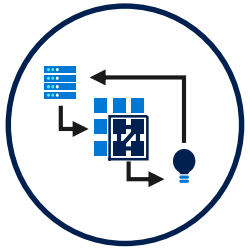
Trusted

Azure Machine Learning

For all skill levels

Access machine learning for all skills and boost productivity.

Rapidly build and deploy machine learning models using tools that meet your needs regardless of skill level. Use the no-code designer to get started with machine learning or use built-in Jupyter notebooks for a code first experience. Accelerate model creation with the automated machine learning UI and access built-in feature engineering, algorithm selection, and hyperparameter sweeping, to develop high accuracy models.



Industry leading MLOps

Operationalize at scale with robust MLOps.

MLOps or DevOps for machine learning, streamlines the machine learning lifecycle, from building models to deployment and management. Use ML pipelines to build repeatable workflows and use a rich model registry to track your assets. Manage production workflows at scale using advanced alerts and automation capabilities. Profile, validate and deploy machine learning models anywhere from the cloud to the edge.

Open & Interoperable

Innovate on an open and interoperable platform.

Take advantage of built-in support for popular open-source tools and frameworks for model training and inferencing. Use familiar frameworks like PyTorch, TensorFlow, scikit-learn and more, or the open and interoperable ONNX format. Choose the development tools that best meet your needs, including popular IDEs, Jupyter notebooks and CLIs or languages like Python and R. After you've built and trained your model, use ONNX Runtime to optimize and accelerate inferencing across cloud and edge devices.

Trusted

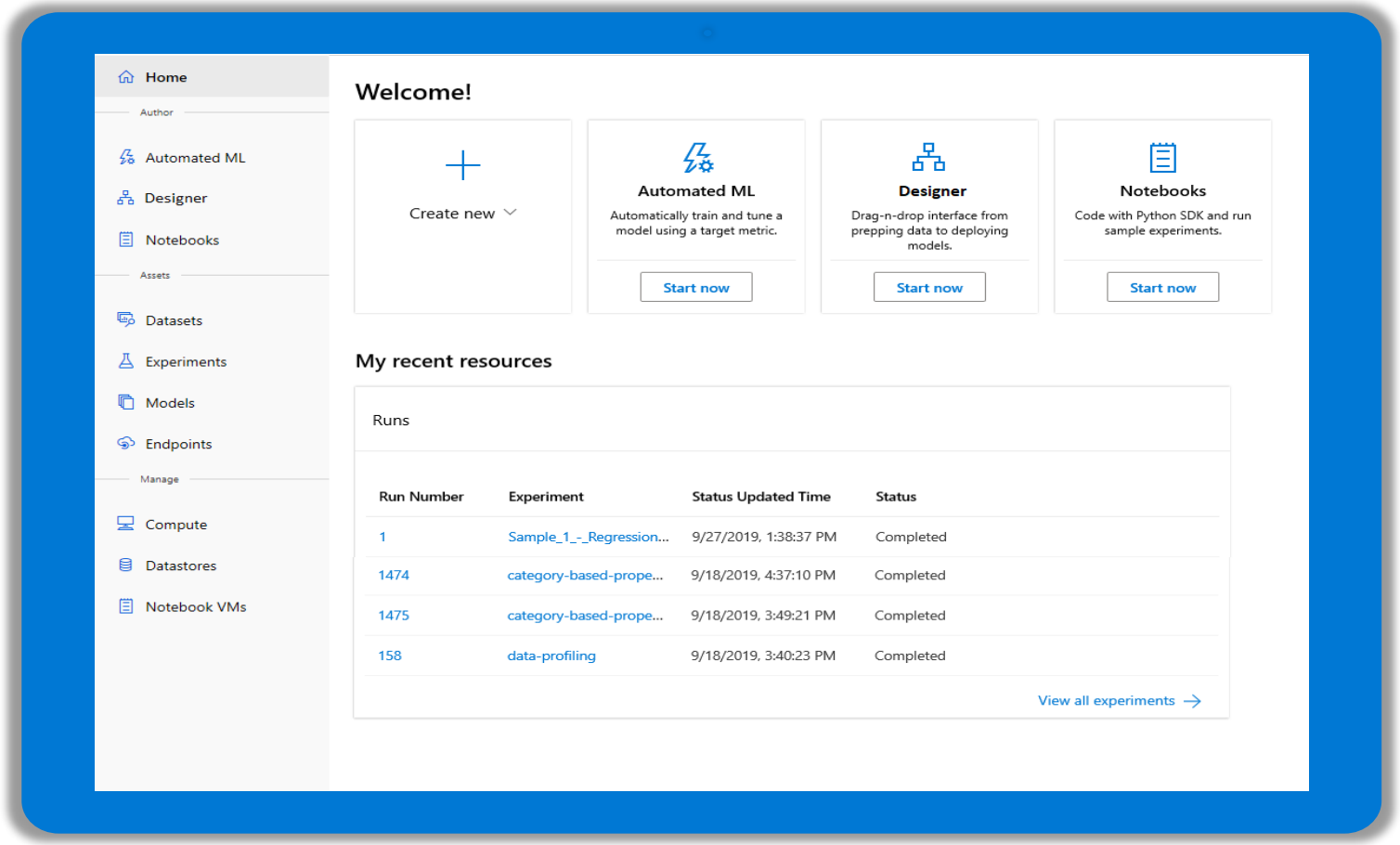
Build responsible AI solutions on a secure trusted platform.

Access state-of-the-art technology for fairness and model transparency. Use model interpretability for explanations about predictions, to better understand model behavior. Reduce model bias by applying common fairness metrics, automatically making comparisons and using recommended mitigations. Enterprise-grade security with role based access control, and virtual network support to protect your assets. Audit trail, quota and cost management capabilities for advanced governance and control.

Azure Machine Learning

For all skill levels

studio web experience



AutoML

Azure Machine Learning accelerates model development

with automated machine learning

Input

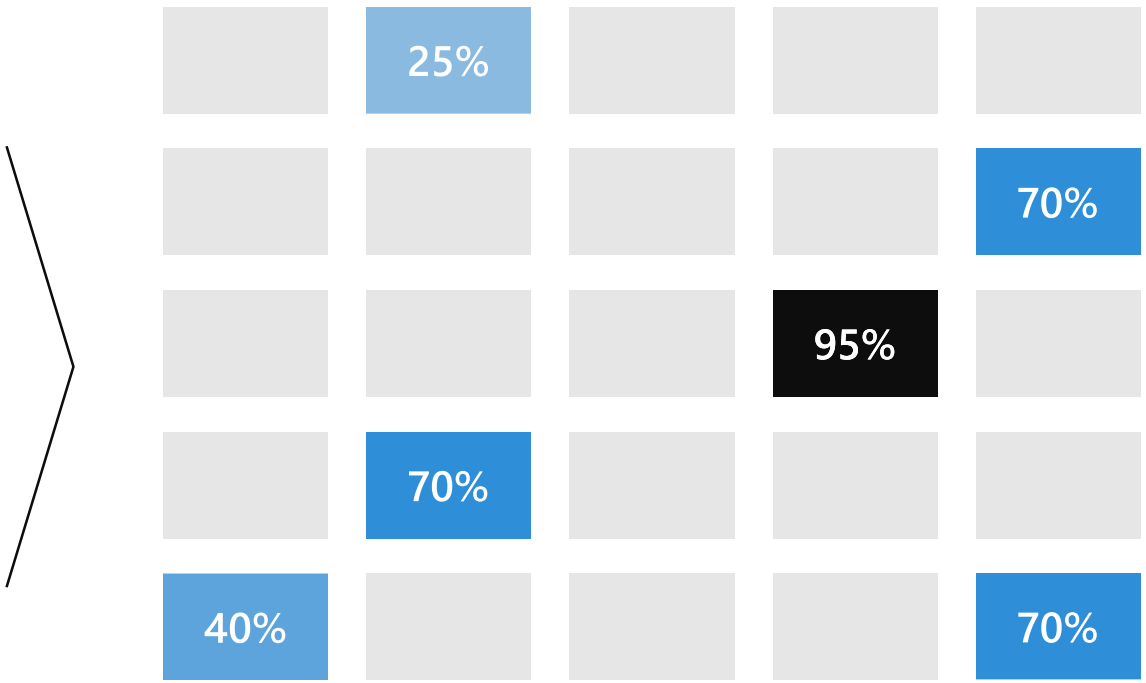
101010
010101
101010

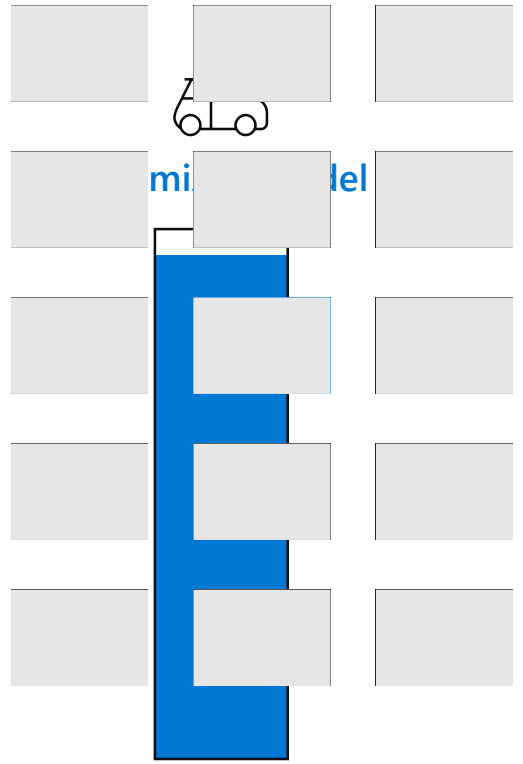
Enter data

Define goals

Apply constraints

Intelligently test multiple models in parallel





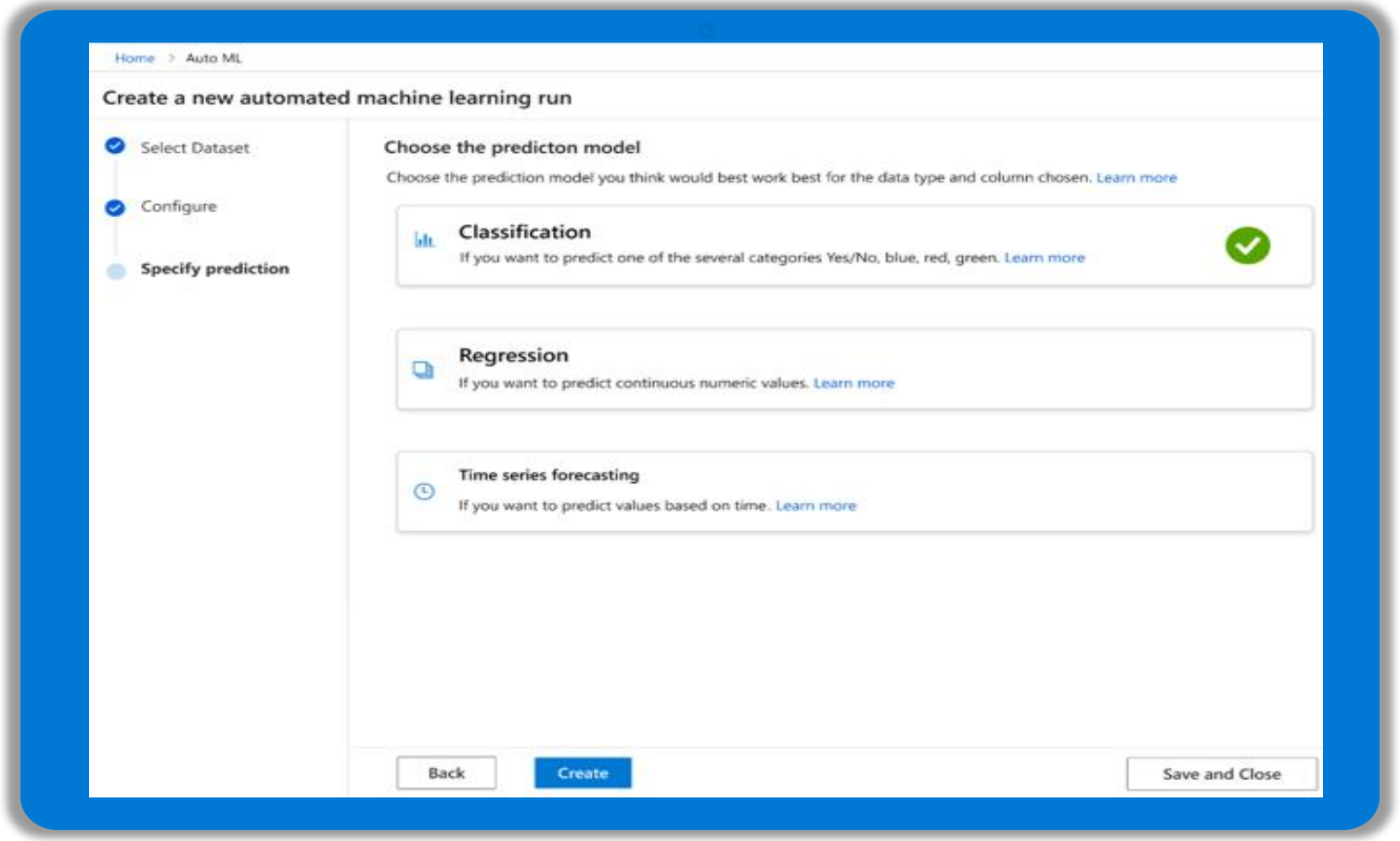
Automated ML

Automatically build and deploy predictive models using the no-code UI or through a code-first notebooks experience.

Increase productivity with easy data exploration and profiling and with intelligent feature engineering.

Easily create accurate models customized to your data and refined by a wide array of algorithms and hyperparameters.

Build responsible AI solutions with model interpretability, and fine-tune your models to improve accuracy.



Automated Machine Learning

What's new

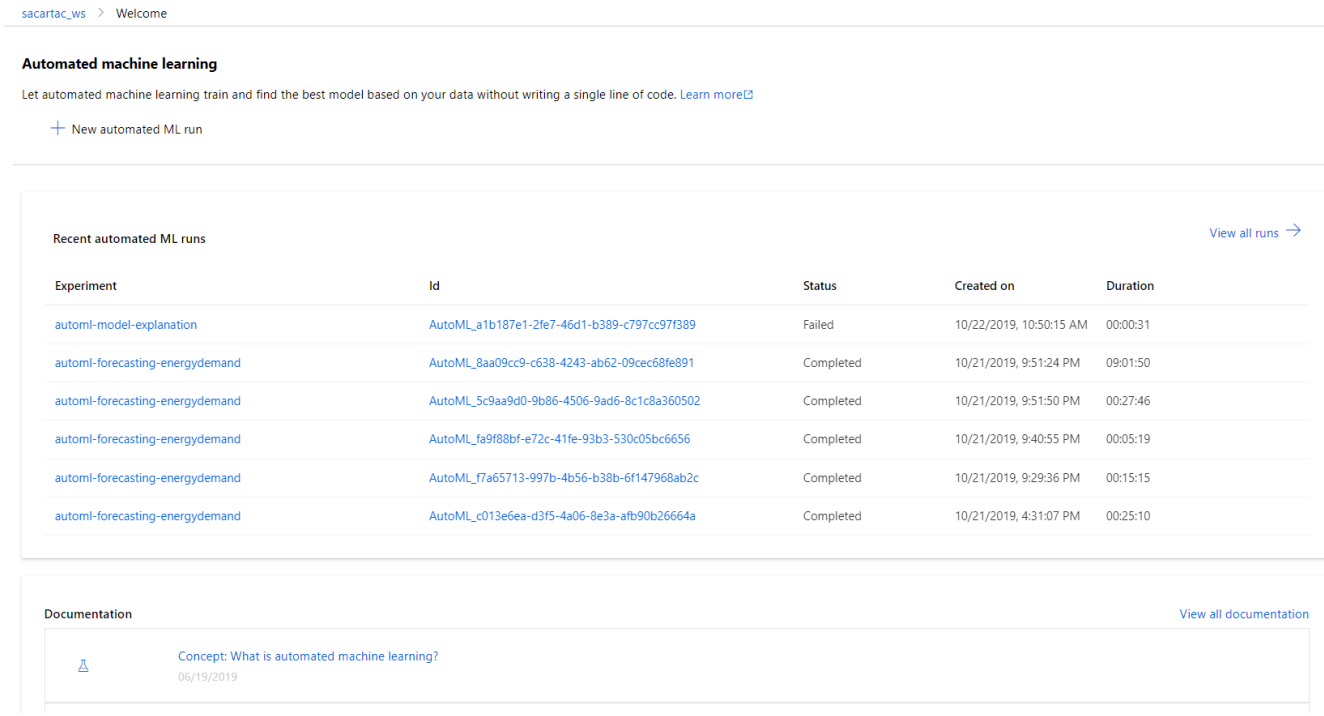
Automated ML UI

New look & feel
Datasets integration: more data sources supported
Featurizer customization
Out-of-the-box model explainability

Automated ML SDK

Deep learning
- Text Classification with BERT (GPU) & BiLSTM (CPU)
- Time series forecasting with ForecastTCN & HyperDrive

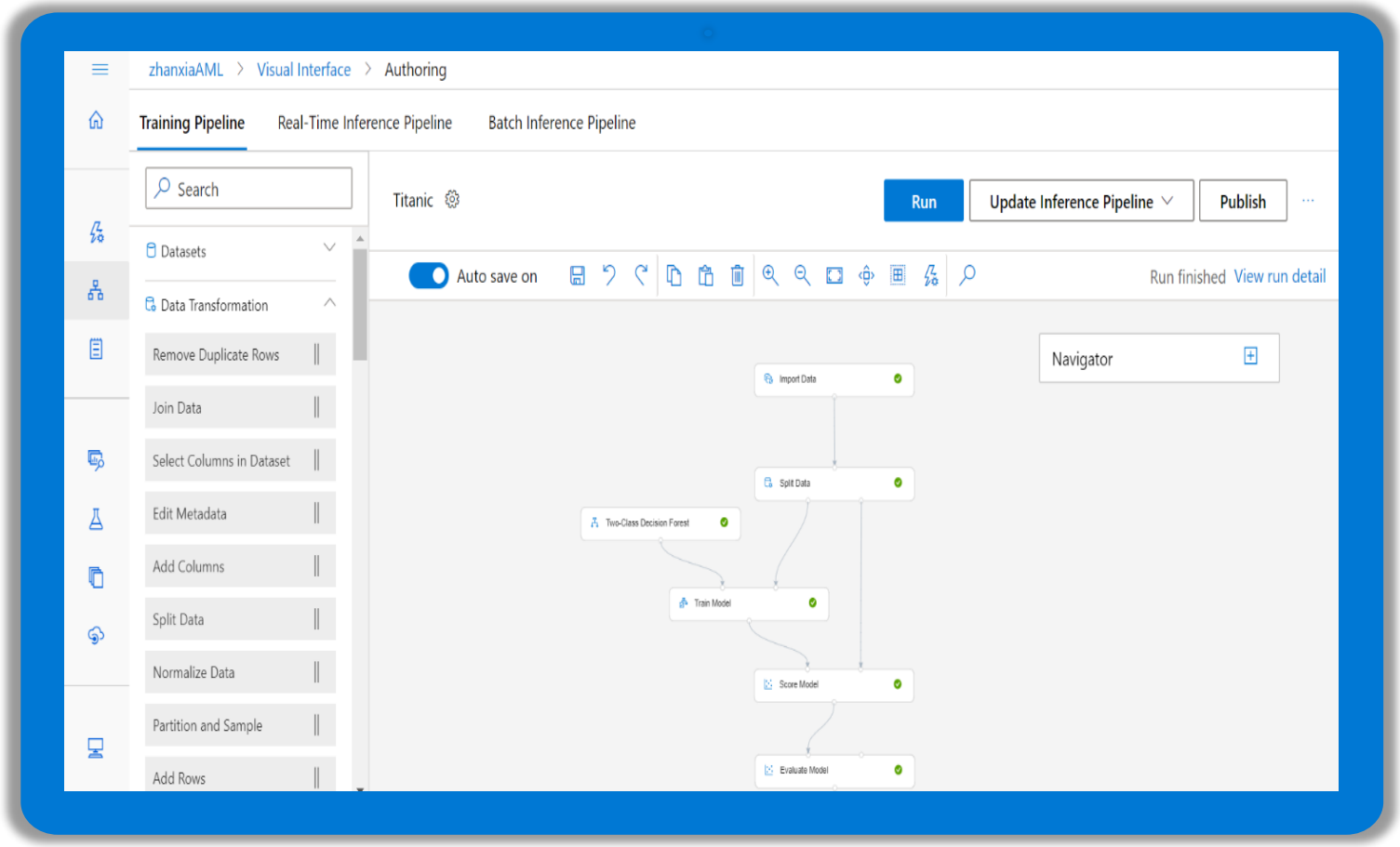
Automatic feature engineering
- Customizable featurization
- Feature transparency: retrieve generated features



Designer

Designer

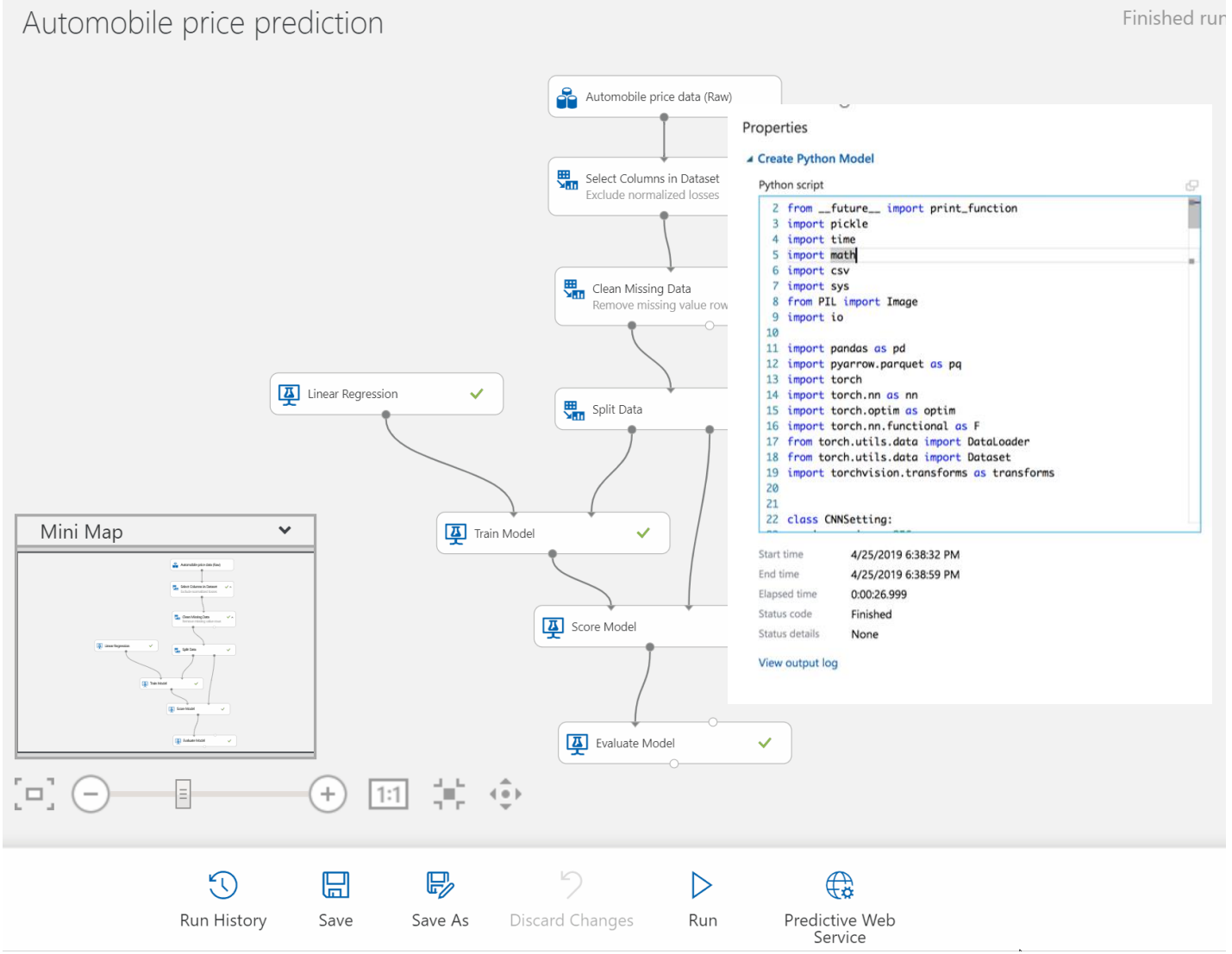
- drag-n-drop workflow capability
- simplify the process of building, testing, and operating machine learning models
- Create new pipelines



Drag and drop modeling with Azure Machine Learning

Designer

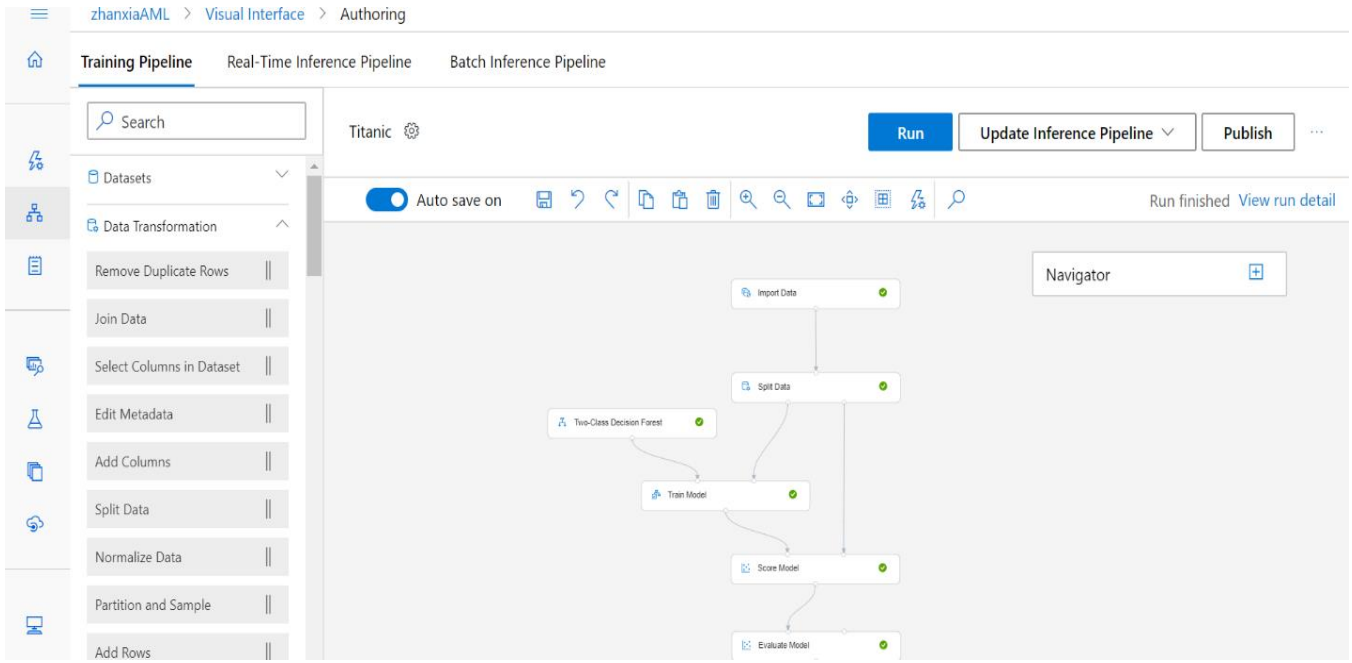
- User built in modules, data visualization, model evaluation
- Automatically generate scoring files, register models and build images using AKS for scale
- Custom code to run Python and R



Machine Learning designer

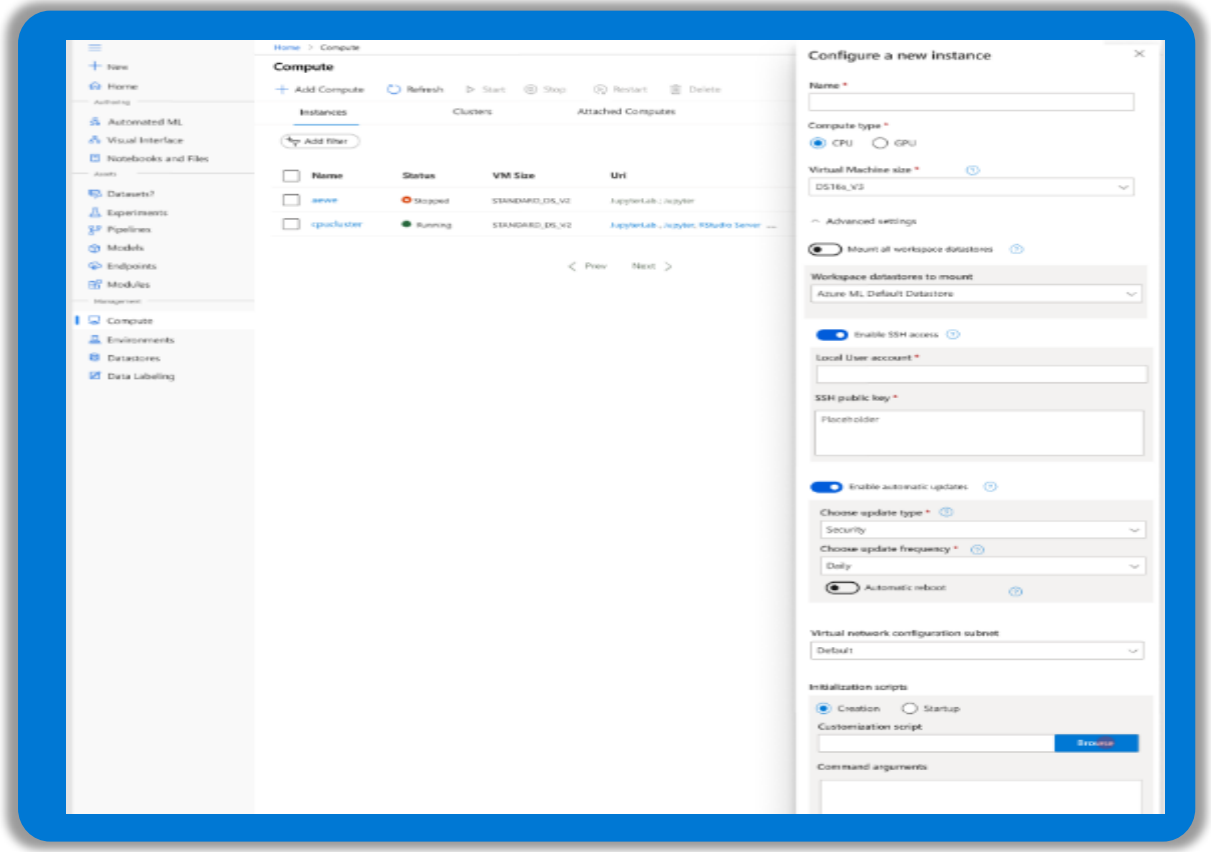
What's new

brings drag-n-drop workflow capability
simplify the process of building, testing, and operating machine learning models
Create new pipelines



Machine Learning notebooks

- Fully managed cloud-based solution for data scientists to get started with ML machine learning
- Deeply integrated with Azure ML workspaces and datastores
- first-class experience for model authoring through integrated notebooks using Azure ML Python and R SDK.
- Management and enterprise readiness capabilities for IT administrators.



Machine Learning Notebooks

What's new in compute instance

Productive

Build and deploy models easily using integrated notebooks and popular tools. Collaboratively debug models and share notebooks within the boundaries of workspace.

Managed and secure

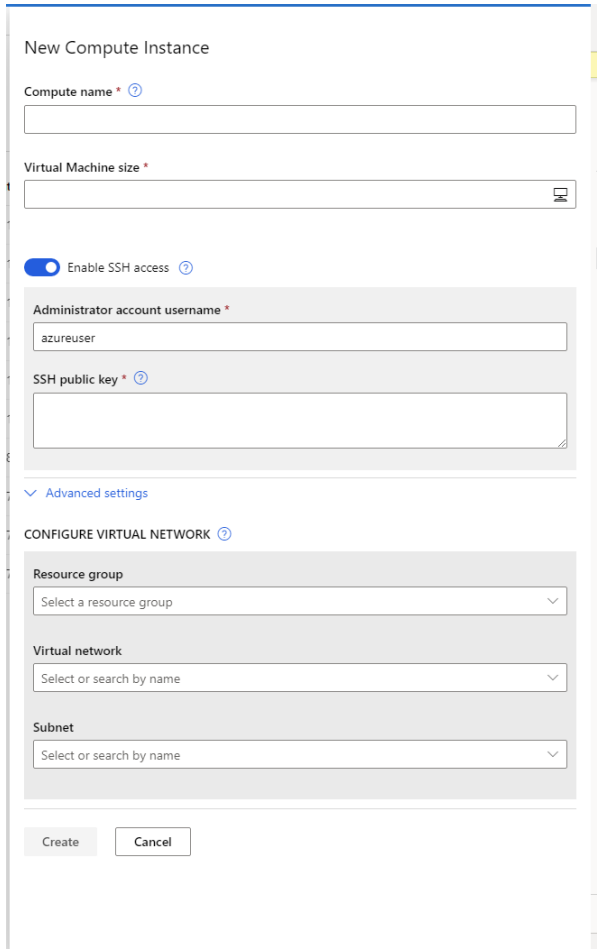
Managed VM form-factor ensures compliance with enterprise security requirements.

Preconfigured for ML

Pre-configured and up-to-date ML packages, GPU drivers and everything Data Scientist needs to save time on setup tasks.

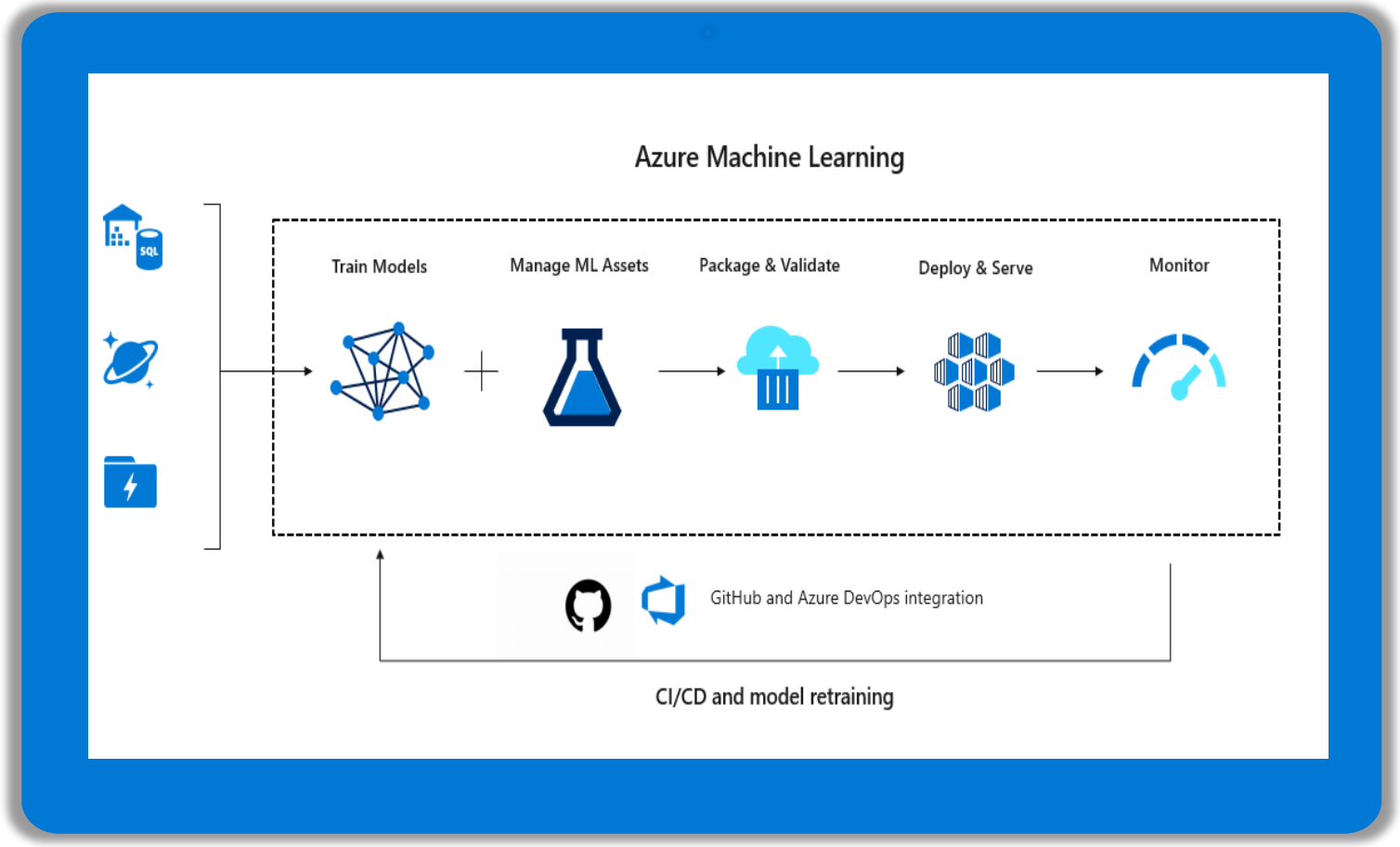
Fully customizable

Broad support for Azure VM types and persisted low-level customization makes advanced scenarios a breeze.



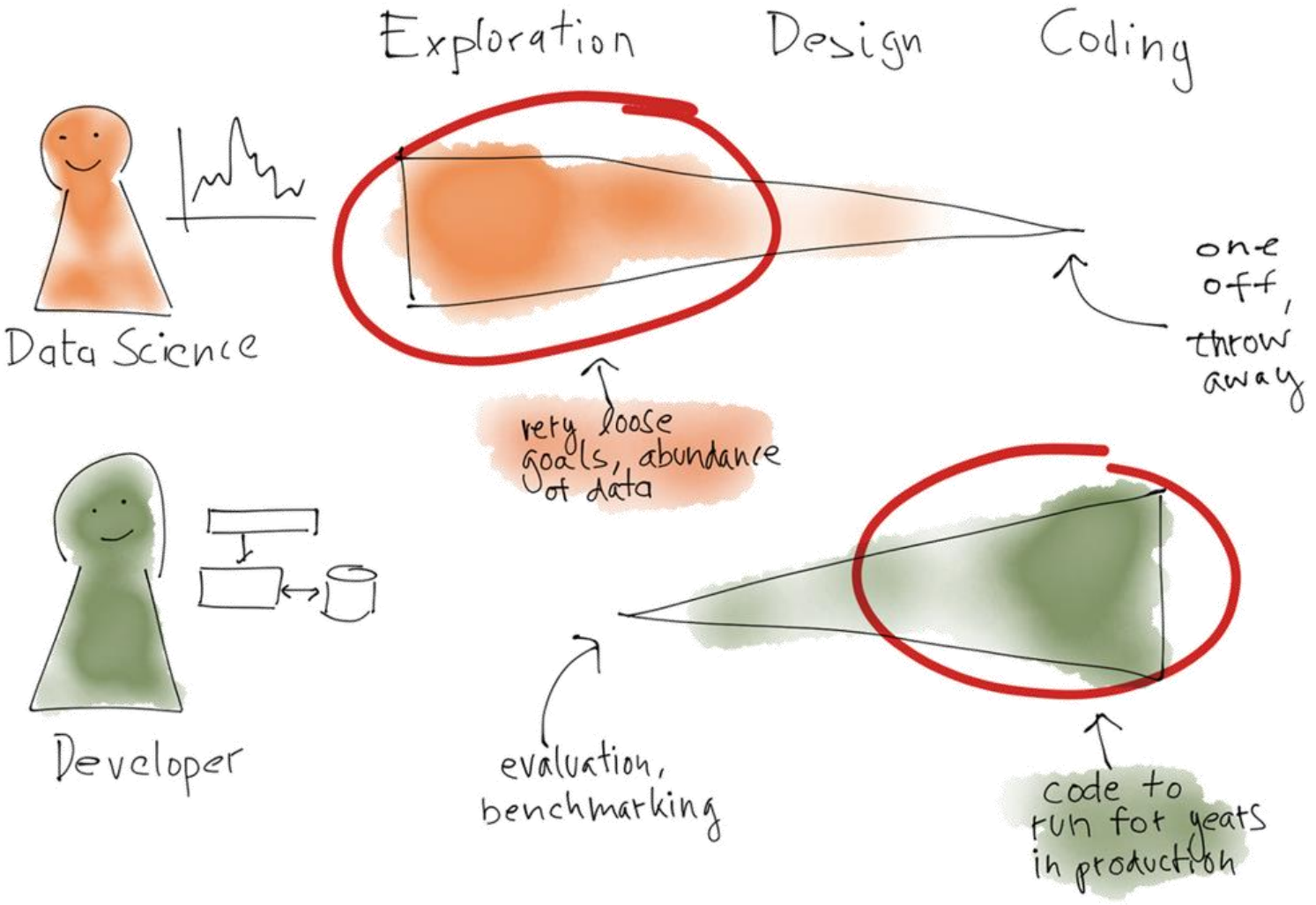
Azure Machine Learning

Industry leading MLOps

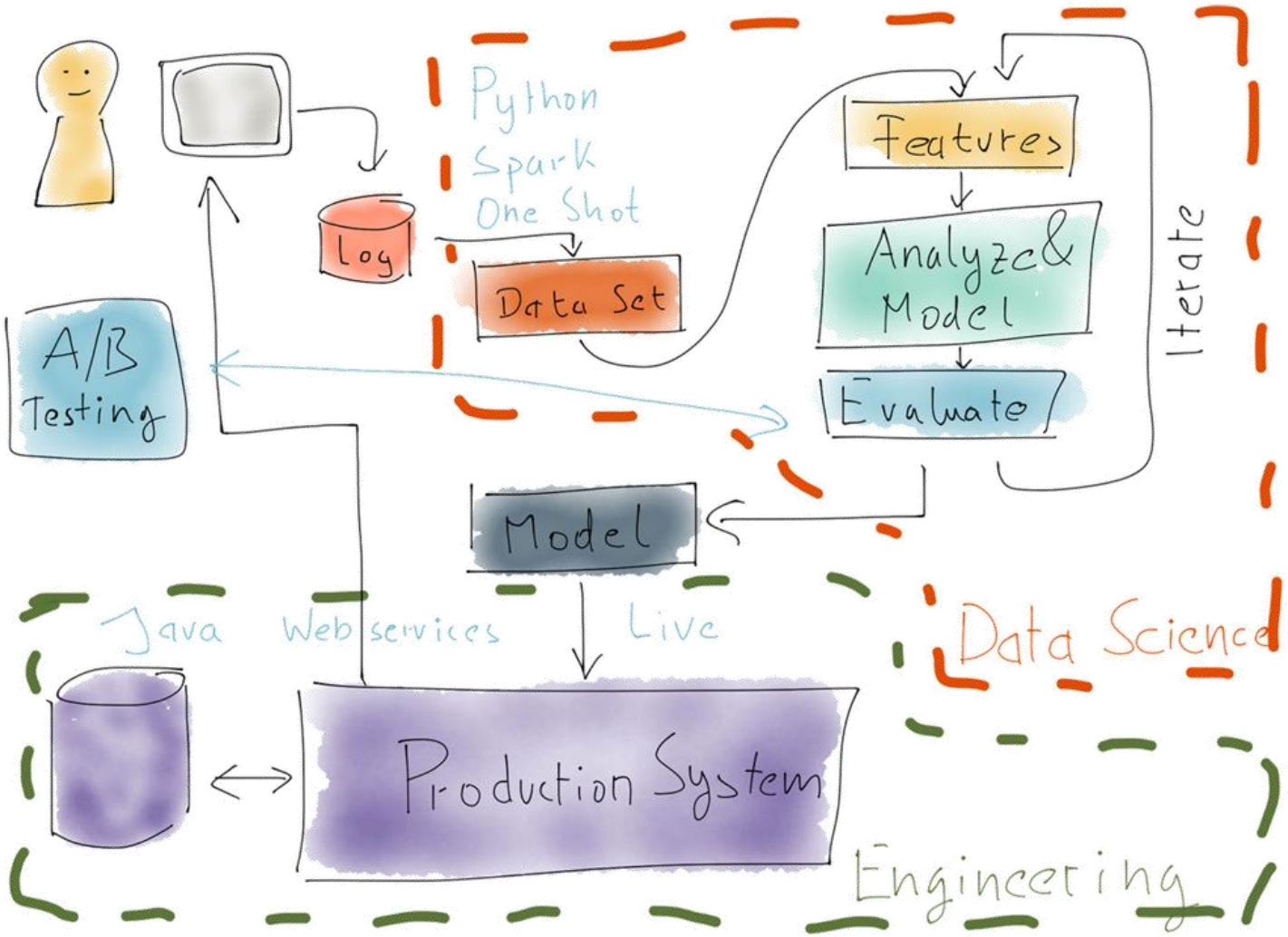


MLOps

Current situation



How to manage?



DevOps

Code reproducibility

Code testing

App deployment

MLOps

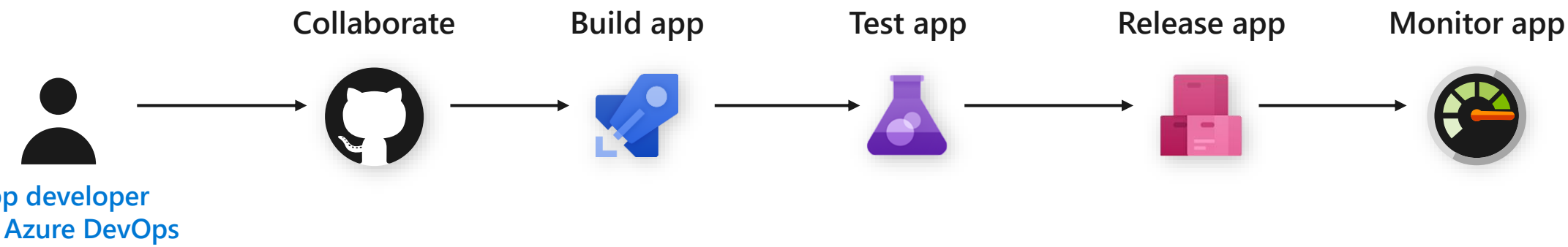
Model reproducibility

Model validation

Model deployment

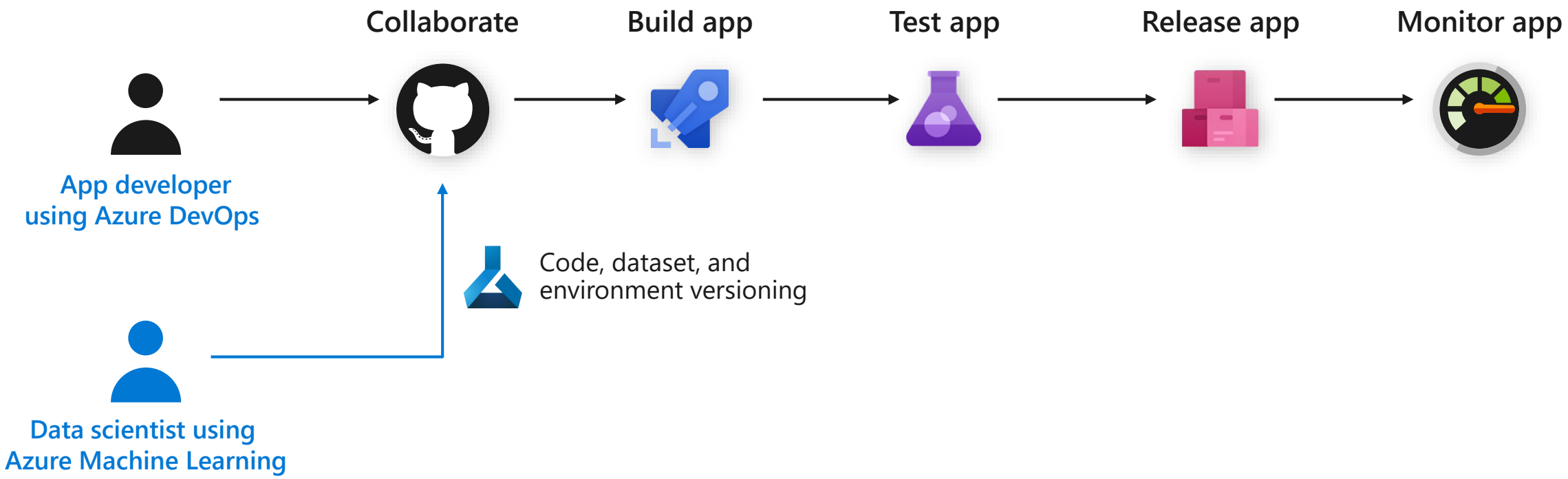
Model retraining

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
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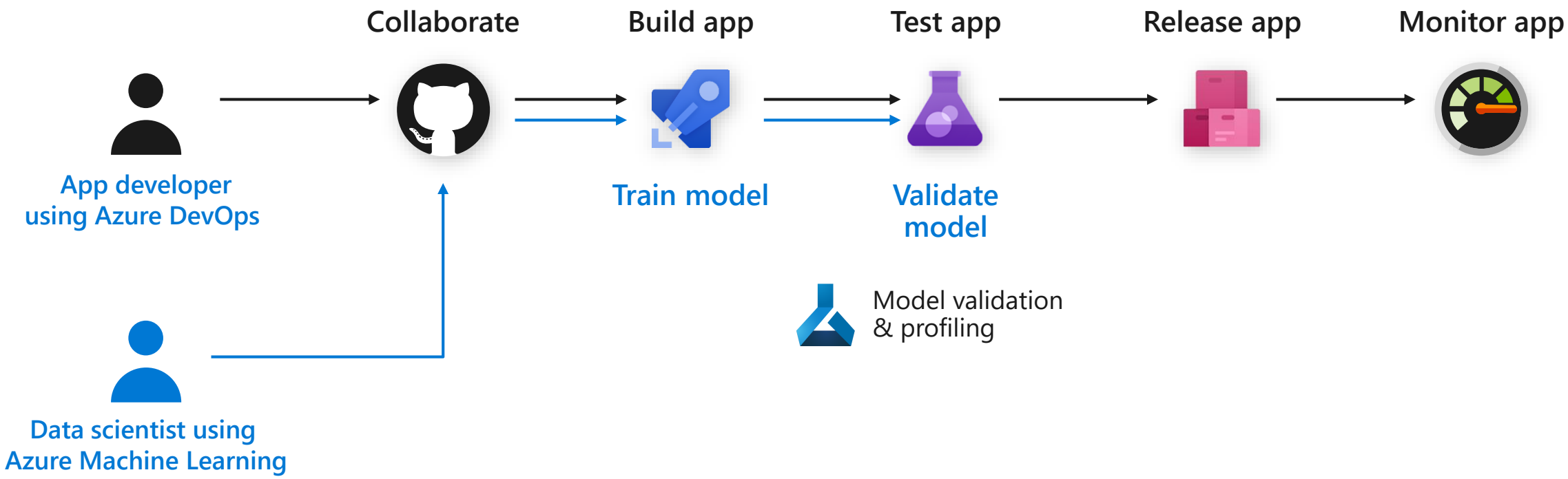
MLOps with Azure Machine Learning



- [x] Model reproducibility
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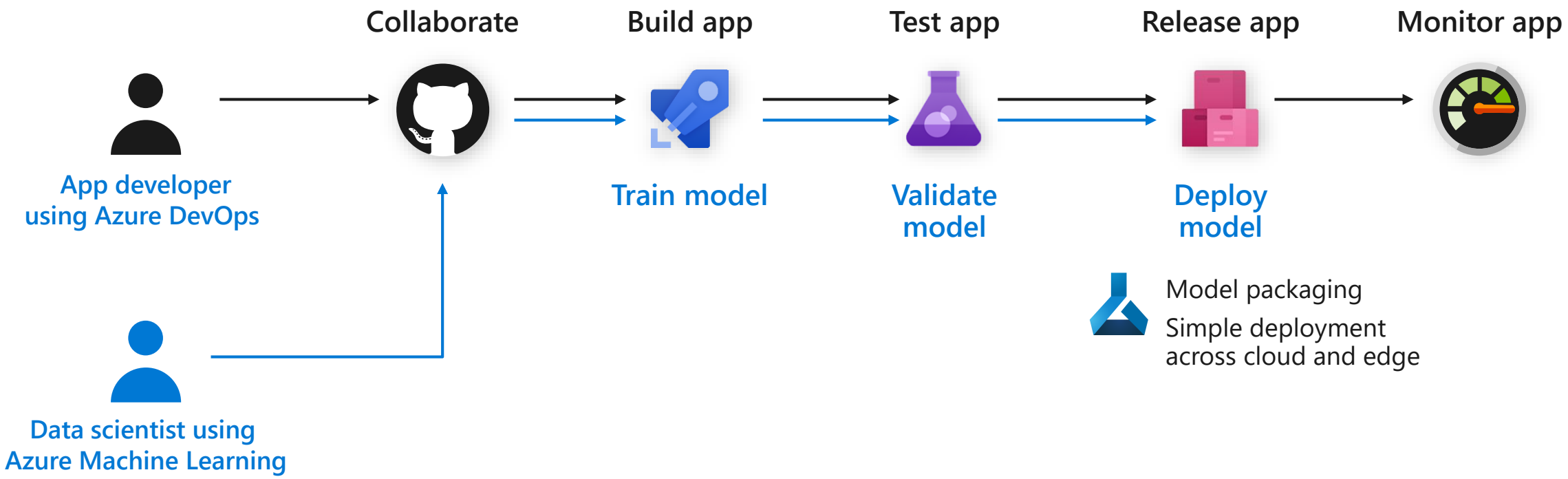
MLOps with Azure Machine Learning



- [x] Model reproducibility
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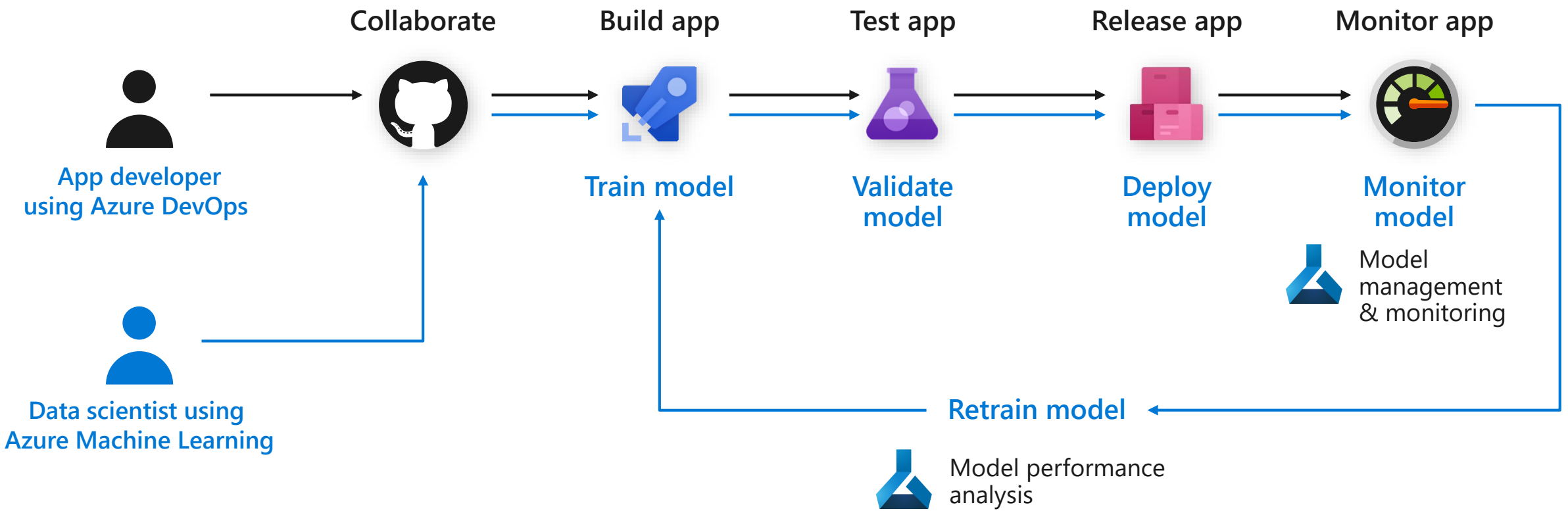
MLOps with Azure Machine Learning



- Model reproducibility
- Model validation
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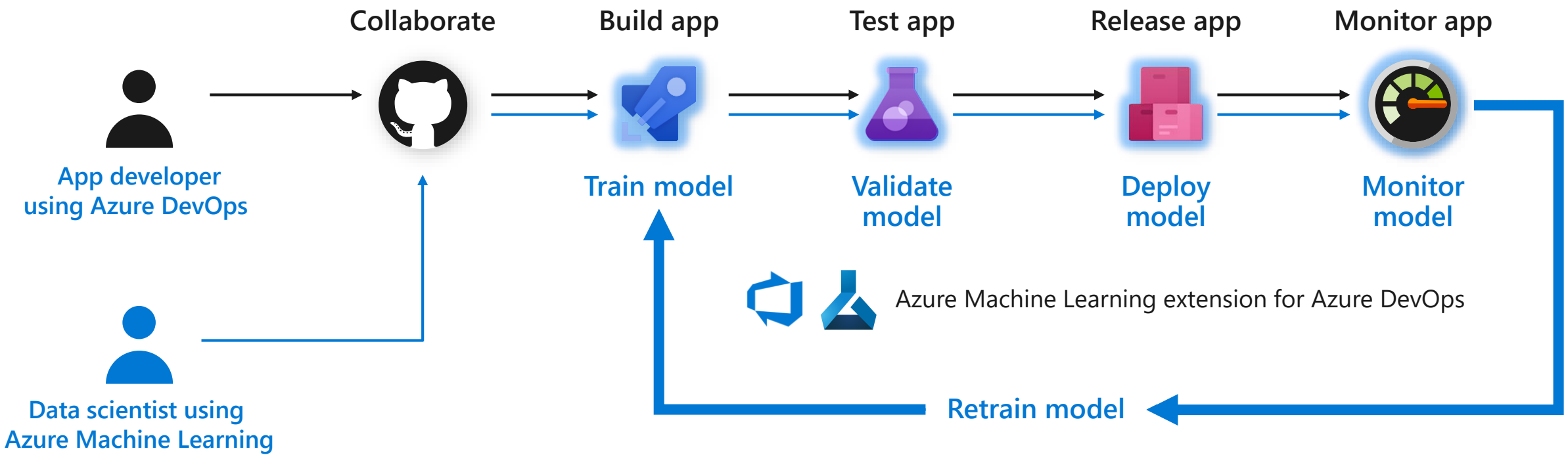
MLOps with Azure Machine Learning



- Model reproducibility
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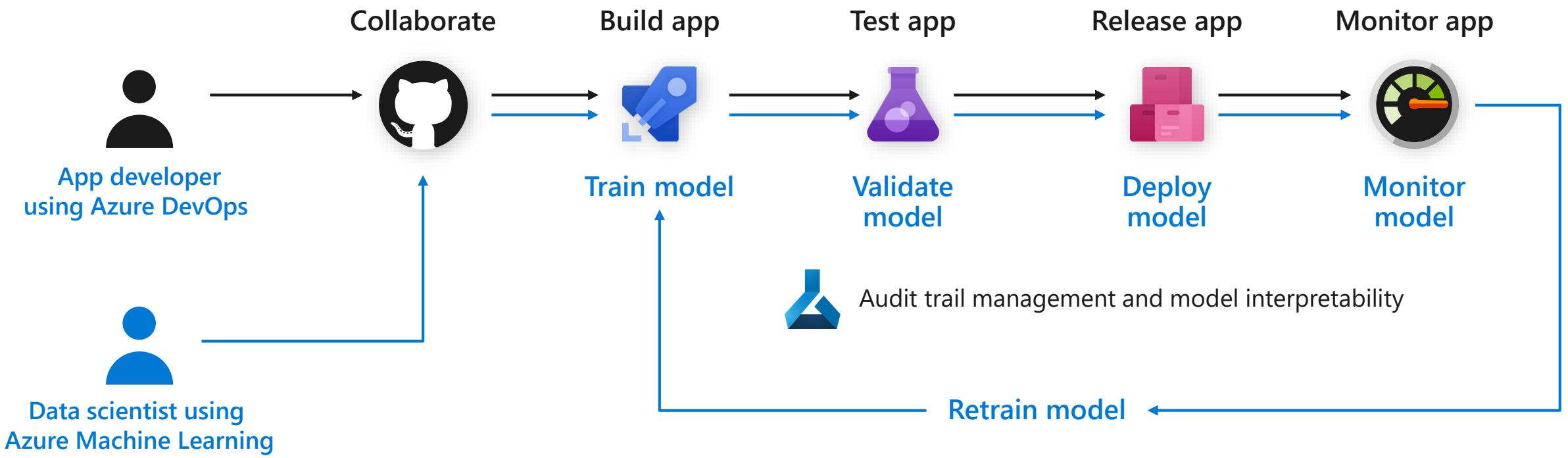
MLOps with Azure Machine Learning



- Model reproducibility
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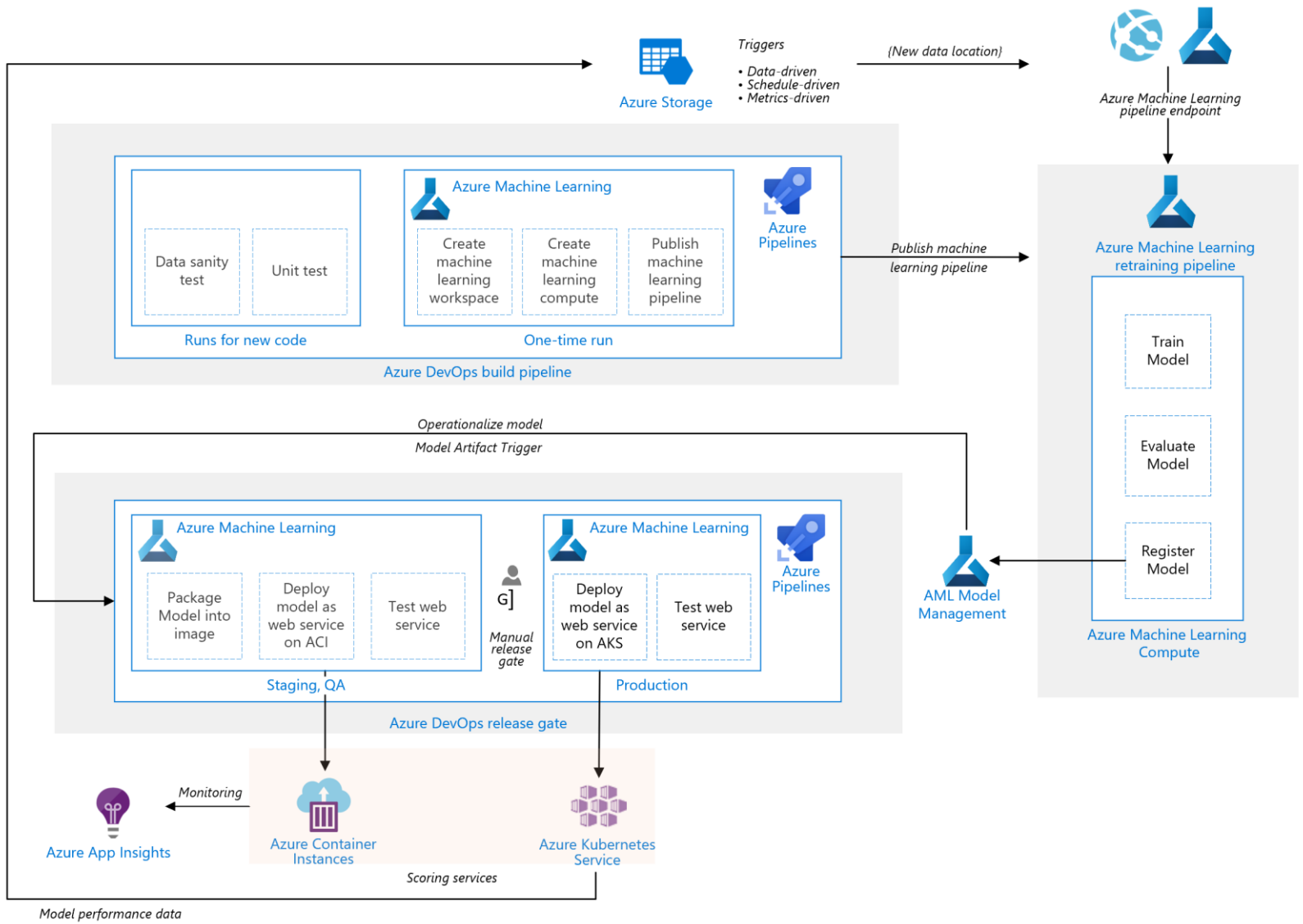

- Model reproducibility
- Model validation
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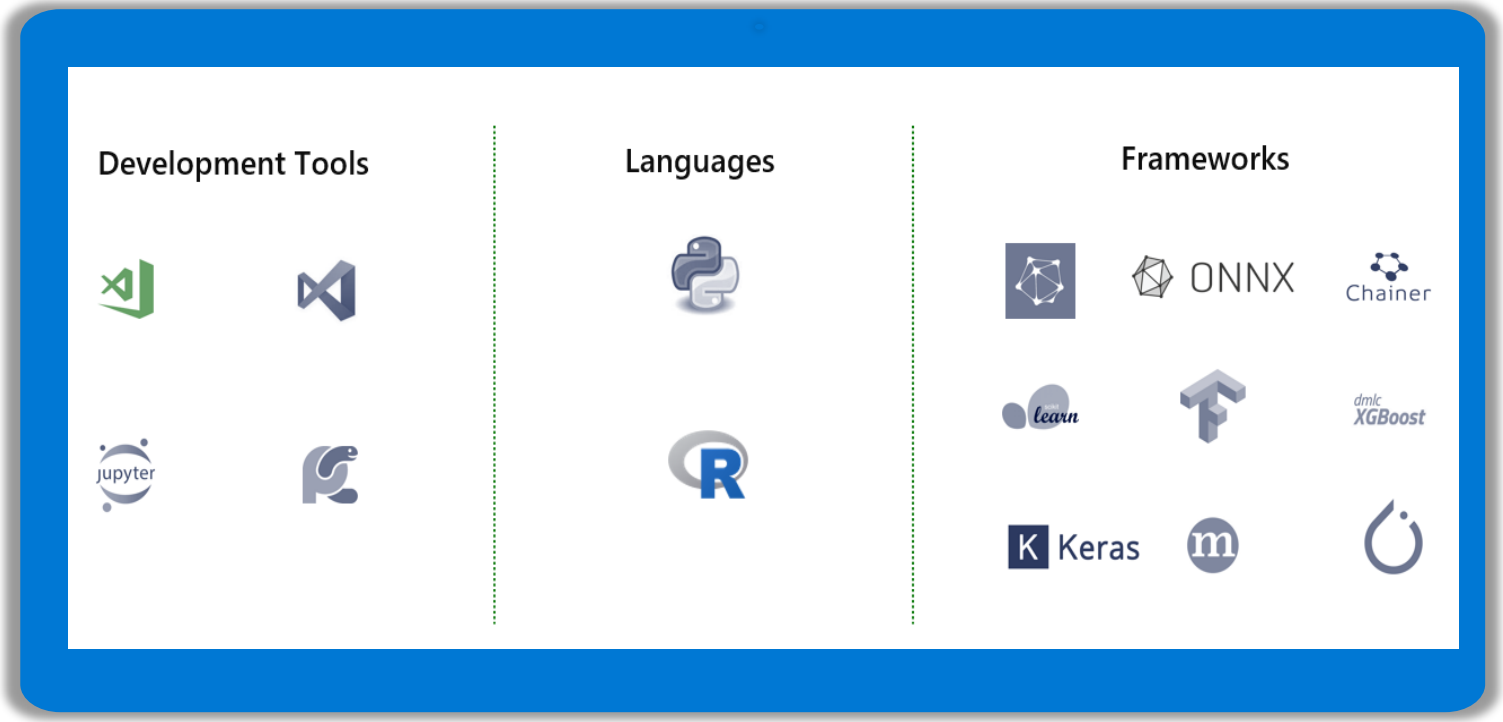
Azure Machine Learning

Open and interoperable platform



Open platform

Native MLflow support

ONNX Runtime updates

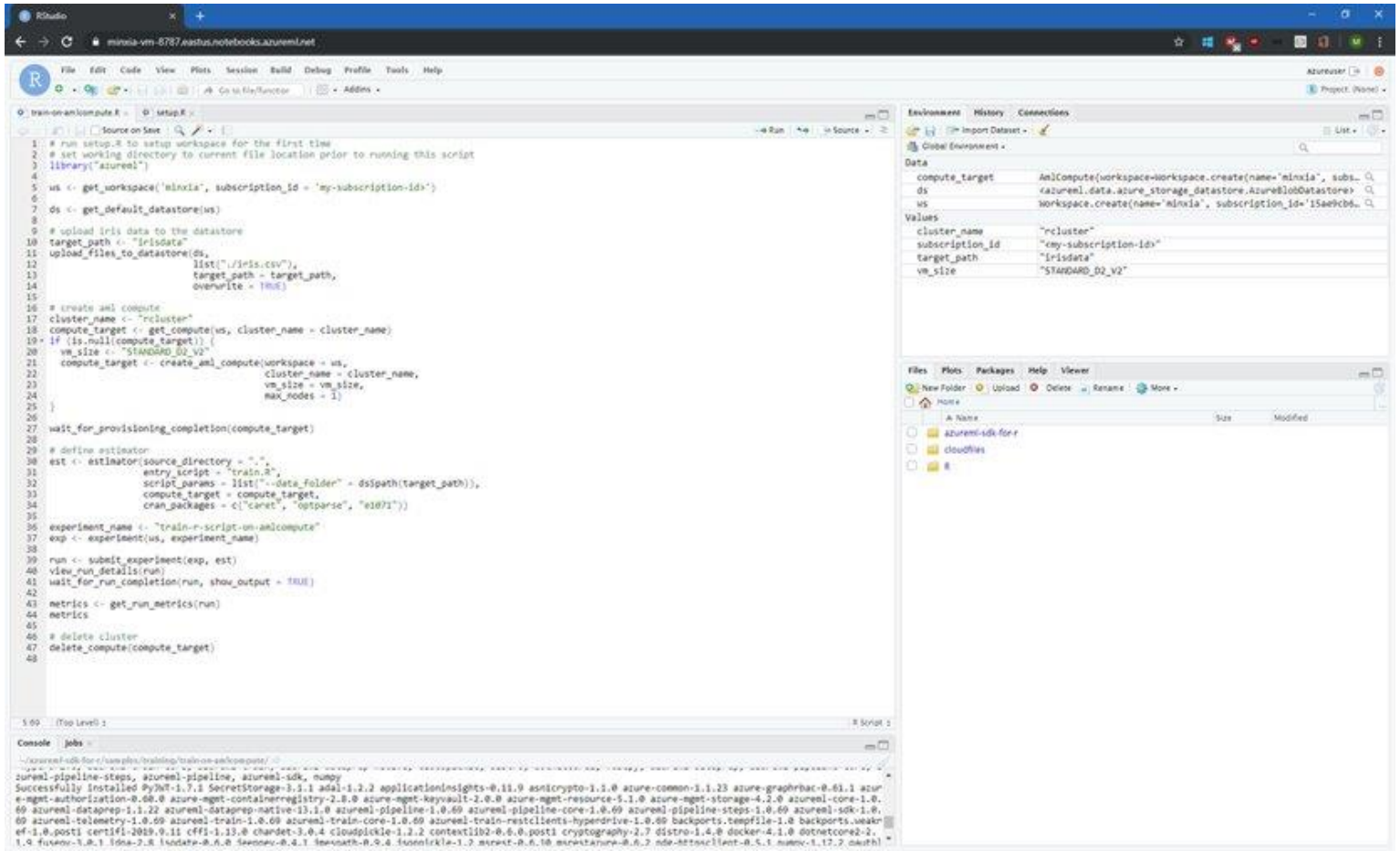
Azure Open Datasets

R support

What's new

R capabilities

- enable data scientists to scale out their R-based machine learning workloads on Azure.



Machine Learning on Azure

Domain specific pretrained models
To simplify solution development


Vision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Search

Familiar Data Science tools
To simplify model development


Visual Studio Code


Azure Notebooks

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Command line

Popular frameworks
To build advanced deep learning solutions


PyTorch


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Productive services
To empower data science and development teams


Azure Databricks


Azure Machine Learning


Machine Learning VMs

Powerful infrastructure
To accelerate deep learning


CPU


GPU


FPGA


From the Intelligent Cloud to the Intelligent Edge

Powerful infrastructure

Accelerate deep learning

CPUs

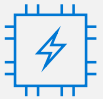
General purpose machine learning

D, F, L, M, H Series

GPUs

Deep learning

N Series



FPGAs

Specialized hardware accelerated deep learning

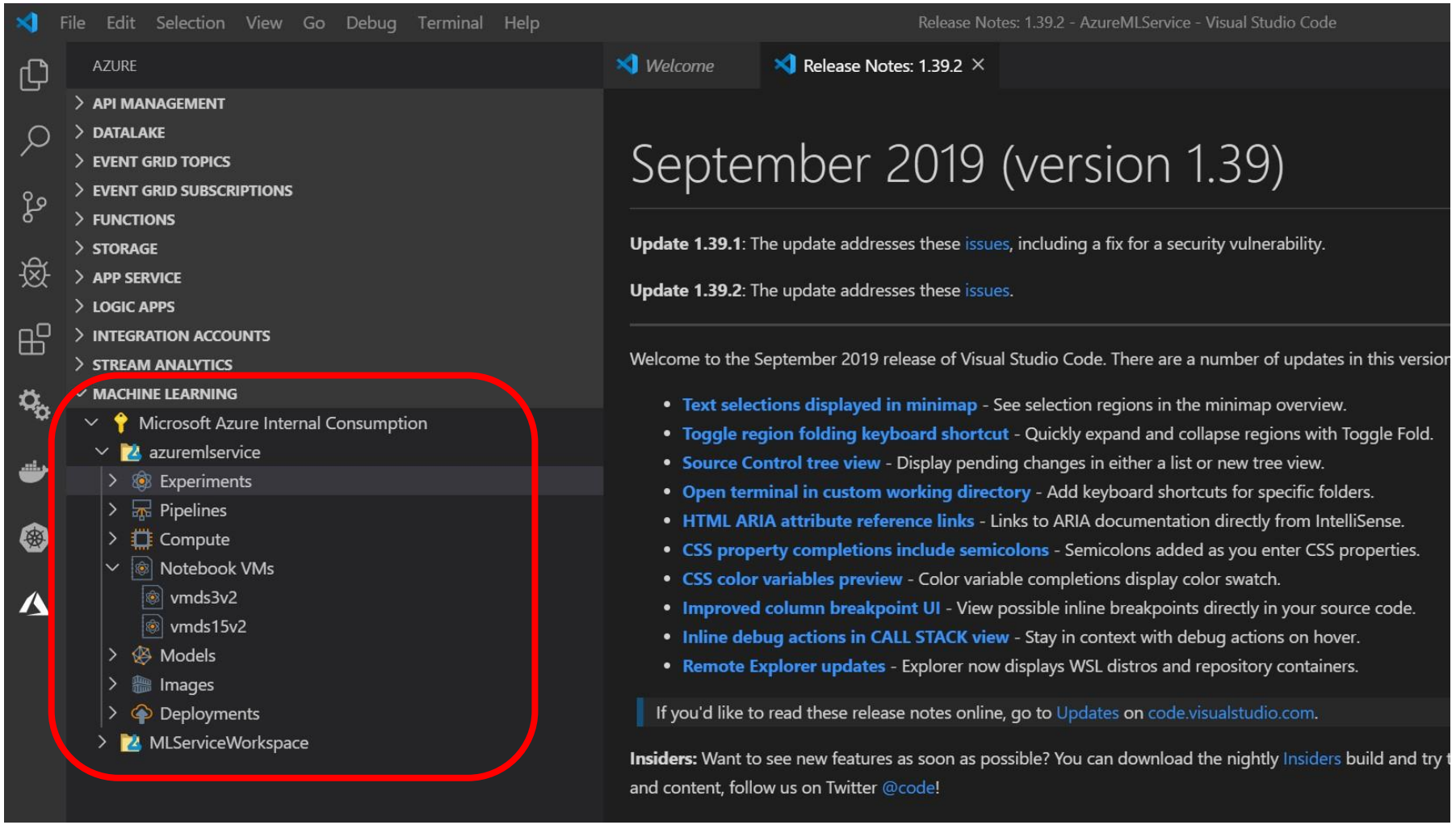
AML hardware accelerated models (Project Brainwave)

Optimized for flexibility

Optimized for performance

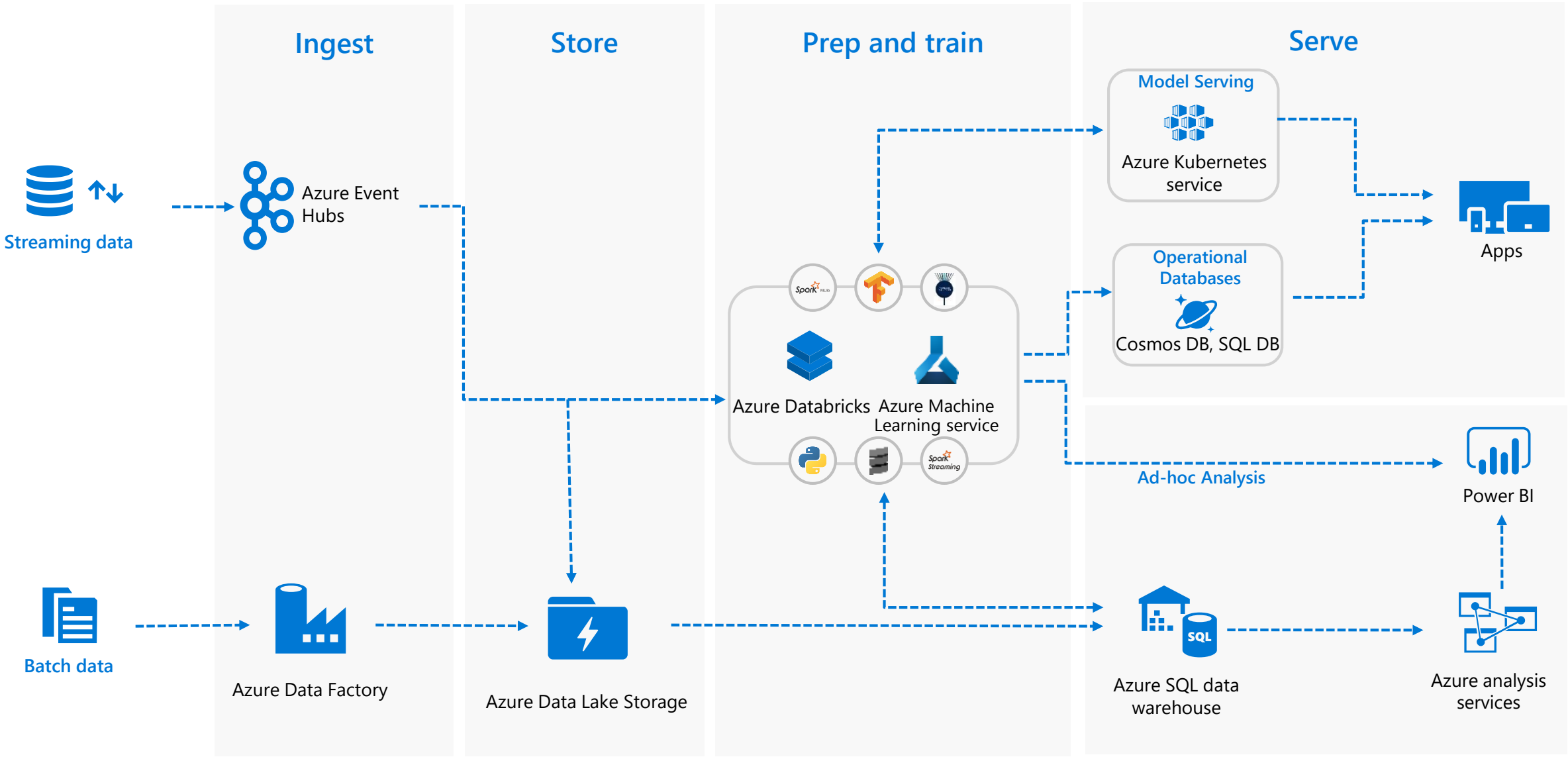
Integration with VS Code

Integration with Visual Studio



Architecture

Recommended architecture to build e2e ML solutions



Azure ML Service Demo


DEMO

Documentation & ressources

Documentation Azure ML service

Lien général :
https://azure.microsoft.com/en-us/services/machine-learning-service/

Pricing :
https://azure.microsoft.com/en-us/pricing/details/machine-learning-service/

Documentation :
https://docs.microsoft.com/en-us/azure/machine-learning/service/

Concepts :
https://docs.microsoft.com/en-us/azure/machine-learning/service/concept-azure-machine-learning-architecture

Forum
https://social.msdn.microsoft.com/Forums/en-US/home?forum=AzureMachineLearningService

Addin Visual Studio
https://marketplace.visualstudio.com/items?itemName=ms-toolsai.vscode-ai#overview

PowerBI Intégration
https://docs.microsoft.com/en-us/power-bi/service-machine-learning-automated

AutoML with Azure ML service References

Schneider Electric :
https://customers.microsoft.com/en-us/story/schneider-electric-power-utilities-azure

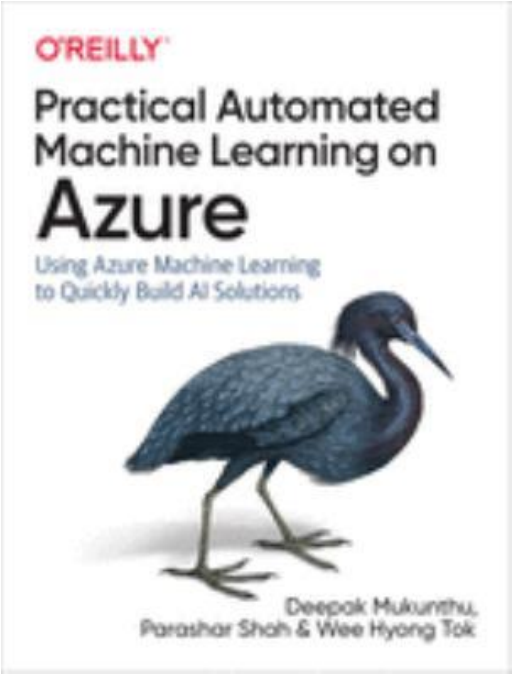
BP:
https://news.microsoft.com/transform/bp-ai-drilling-data-fueling-smarter-decisions/

Boots:
https://customers.microsoft.com/en-us/story/733091-walgreens-boots-alliance-pharmaceuticals-azure

AutoML integration with PowerBI:
https://customers.microsoft.com/en-us/story/724164-macaw-partner-professional-services-power-bi

Blog : https://azure.microsoft.com/blog/announcing-automated-ml-capability-in-azure-machine-learning/

Book: https://www.amazon.com/Practical-Automated-Machine-Learning-Azure-ebook/dp/B07Y8X2HH4/ref=sr_1_1?keywords=automl+azure&qid=1573050215&s=digital-text&sr=1-1

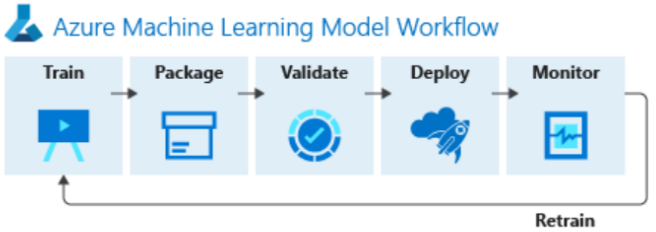


Azure ML service Git

https://github.com/Azure/MachineLearningNotebooks/

Azure Machine Learning service example notebooks

This repository contains example notebooks demonstrating the Azure Machine Learning Python SDK which allows you to build, train, deploy and manage machine learning solutions using Azure. The AML SDK allows you the choice of using local or cloud compute resources, while managing and maintaining the complete data science workflow from the cloud.



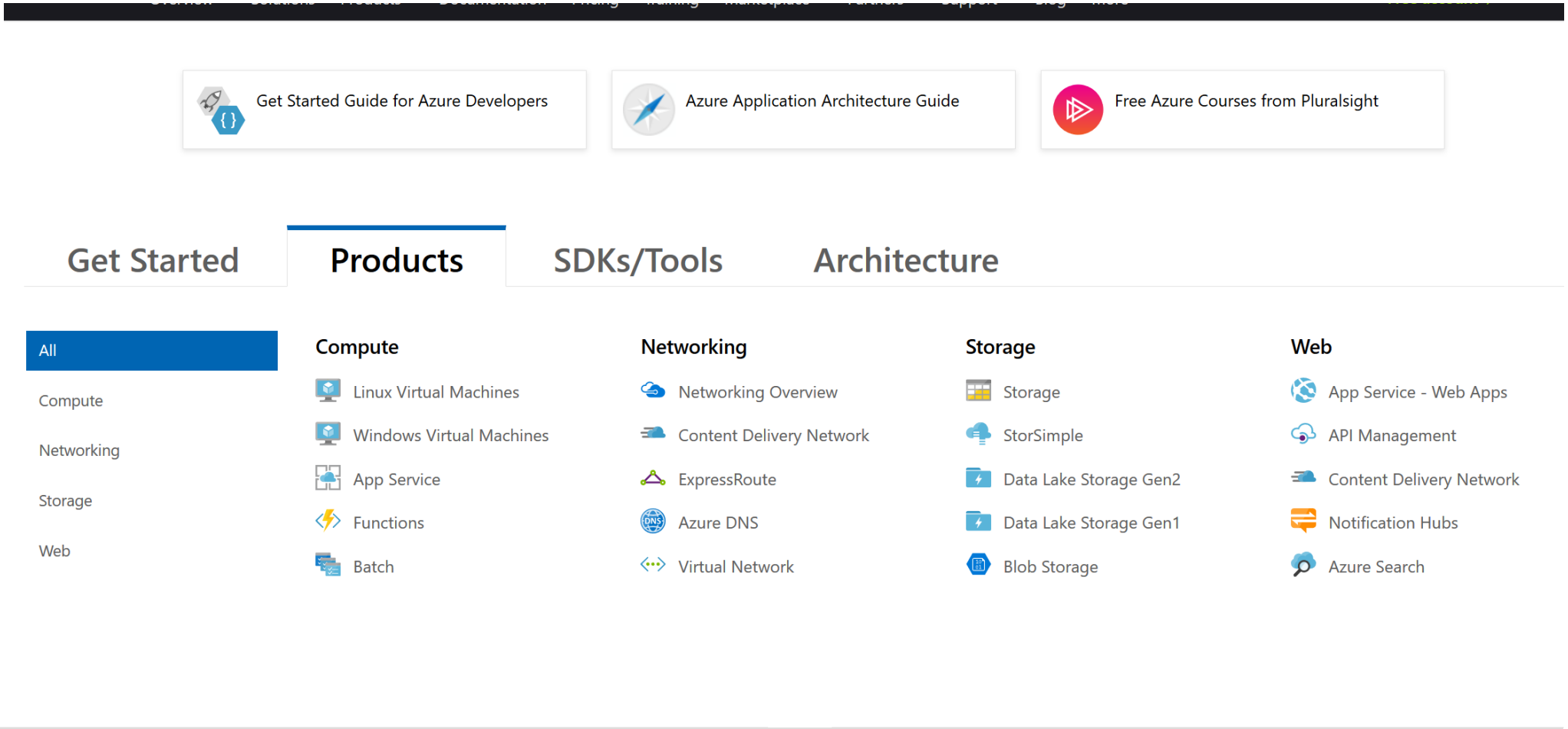
Quick installation

```
pip install azureml-sdk
```

Read more detailed instructions on how to set up your environment using Azure Notebook service, your own Jupyter notebook server, or Docker.

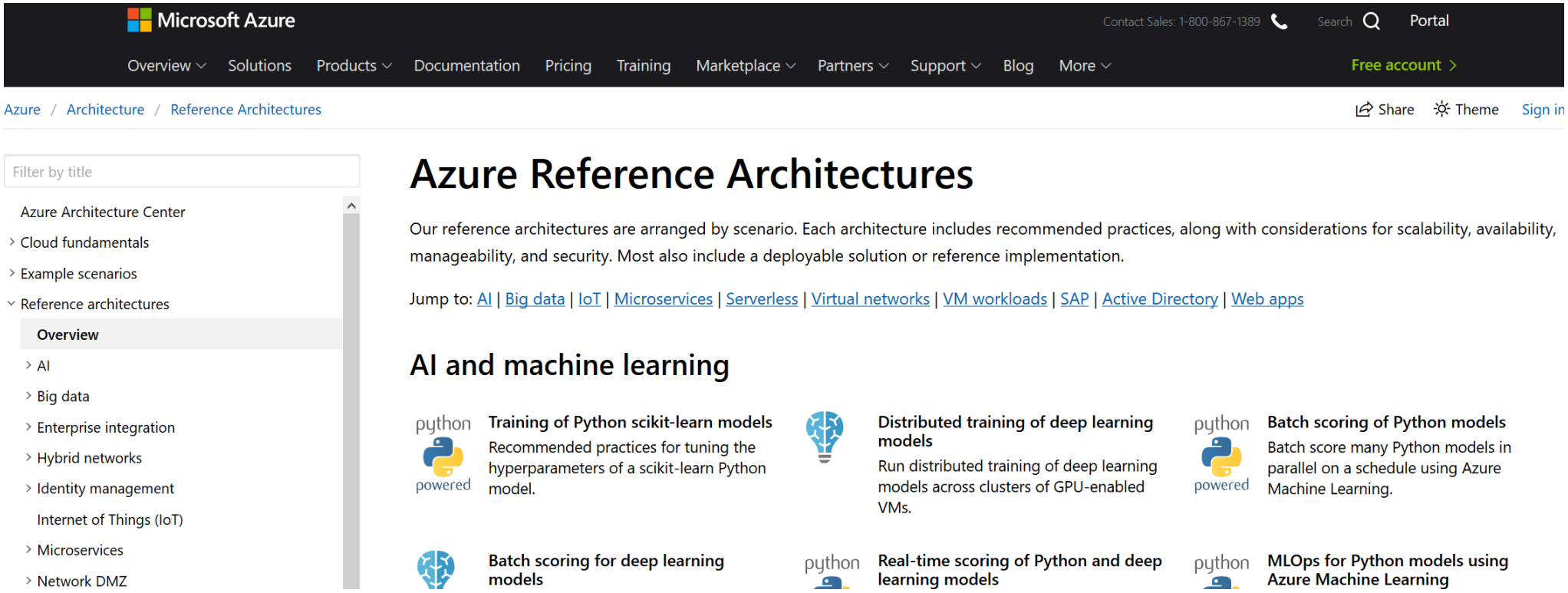
How to navigate and use the example notebooks?

If you are using an Azure Machine Learning Notebook VM, you are all set. Otherwise, you should always run the Configuration notebook first when setting up a notebook library on a new machine or in a new environment. It configures your notebook library to connect to an Azure Machine Learning workspace, and sets up your workspace and compute to be used by many of the other examples.



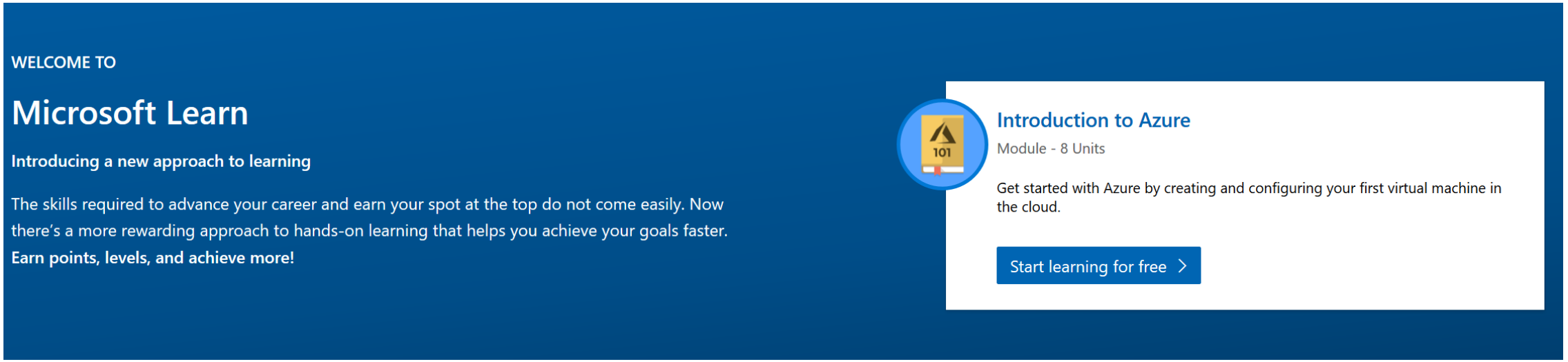
Documentation Microsoft

https://docs.microsoft.com/en-us/azure/#pivot=products



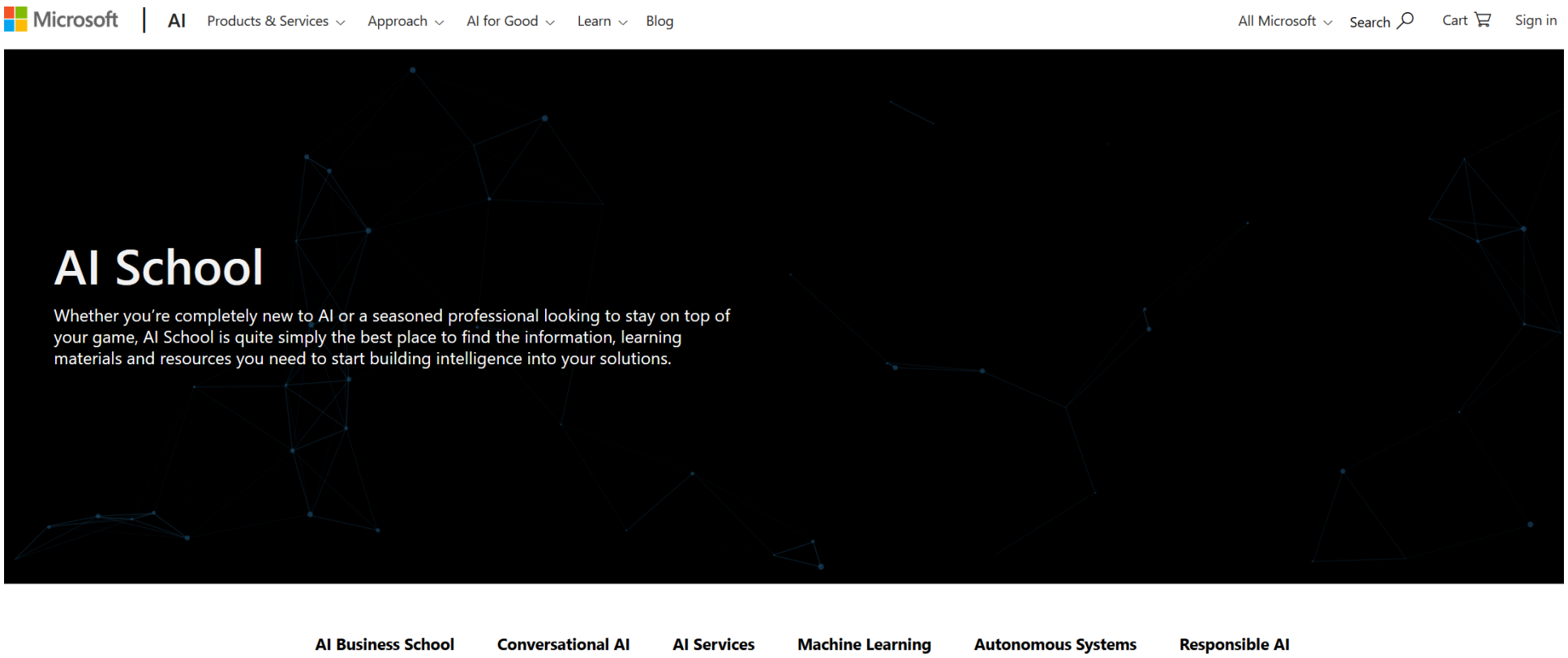
Architectures Microsoft

https://docs.microsoft.com/en-us/azure/architecture/



Microsoft Learn

https://docs.microsoft.com/en-us/learn/



Microsoft AI School

https://aischool.microsoft.com/en-us/home

Contenu du workshop (présentations, notebooks…)

http://aka.ms/workshopAML2019