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Cloud Solution Architect – Data & AI



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TECH DAY

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Level up your game using
Azure and Reinforcement
Learning!

Goal: getting the Agent out of the maze



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What is Machine Learning?

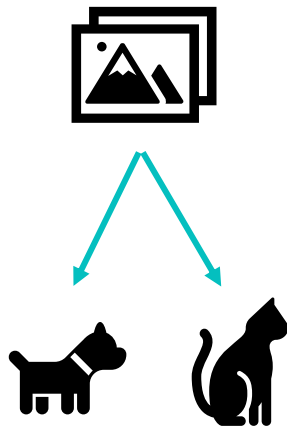


“Machine Learning is the study of computer algorithms that allow computer programs to automatically improve through experience.”

Tom Mitchell

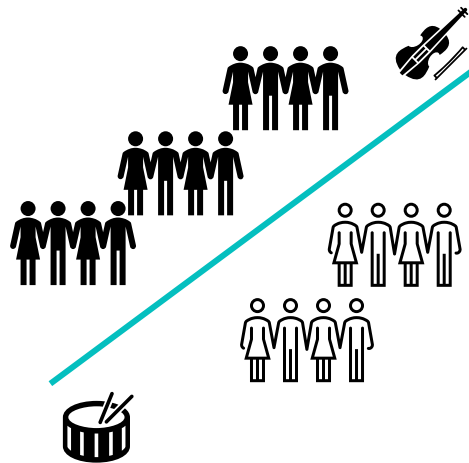
Machine Learning types

What's in the pic?



Supervised Learning

What would you like?



Unsupervised Learning

Can I play with you?



Reinforcement Learning

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What is Reinforcement Learning?



Reinforcement Learning

Main goal:

Taking suitable actions to maximize reward in a particular environment.

Components of an RL agent:

- Agent
- Environment (transitions and reward models)
- Actions (policies)
- Rewards (value function)



Categories of RL Algorithms

Model Based

Learns a transition and reward models of the environment to compute optimal policy

Model Free

Learns an optimal policy by interacting with the environment

Value Based

Learns a value function explicitly and computes the policy from that

Policy Based

Learns a policy directly without computing a value function

Actor Critic

Learns both a policy (the actor) and a value function (the critic), which measures how good a policy is

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Azure AI Platform



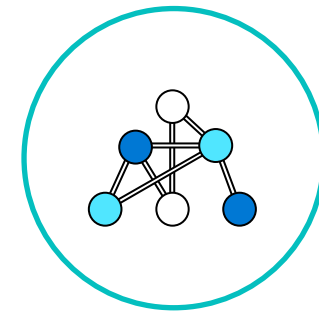
Azure AI



AI apps & agents



Knowledge mining



Machine learning

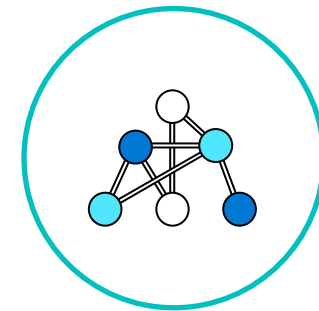
Azure AI



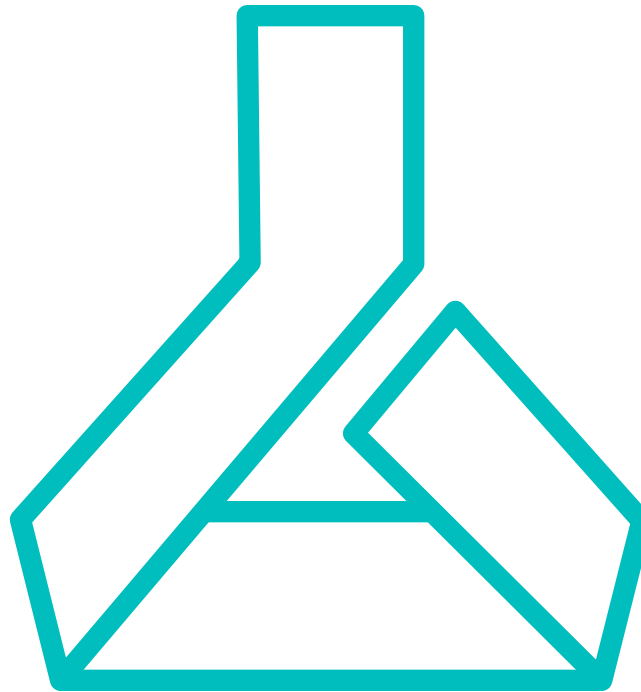
AI apps & agents



Knowledge mining

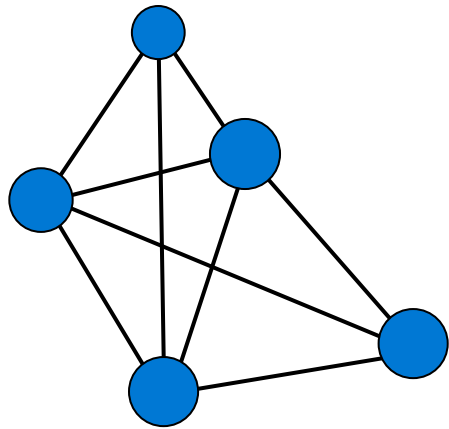


Machine learning

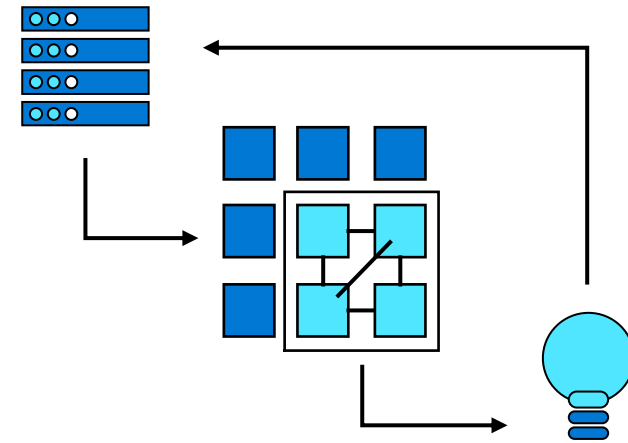


Azure Machine Learning

Azure Machine Learning Service

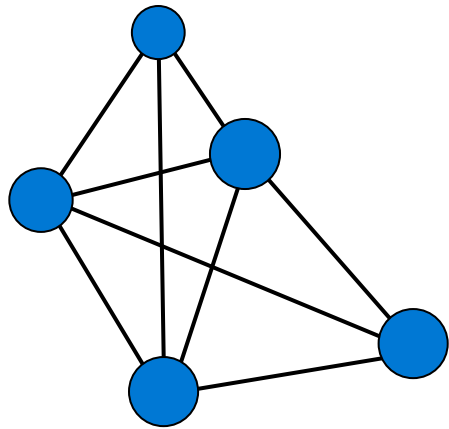


Simplified machine learning

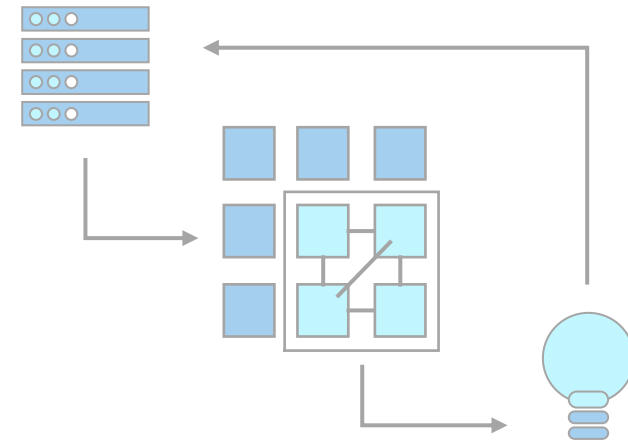


End to end lifecycle management

Azure Machine Learning Service

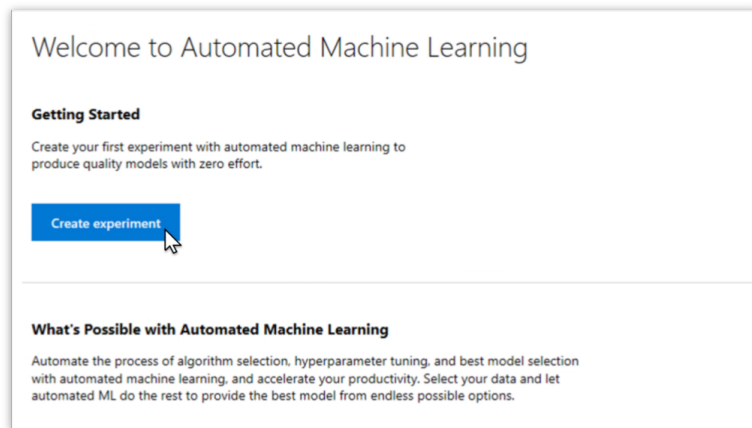


Simplified machine learning

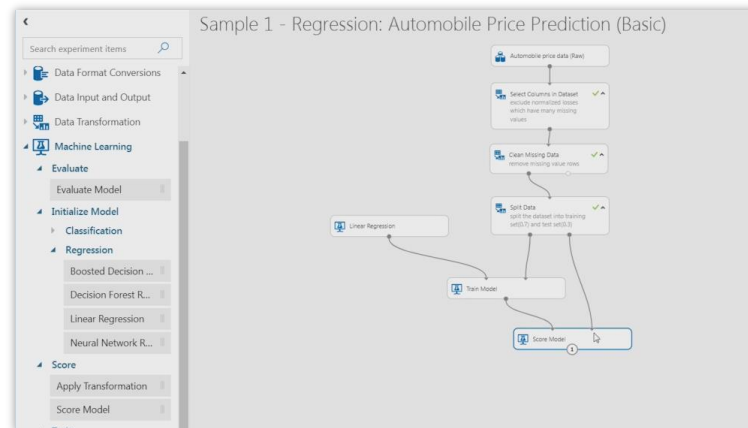


End to end lifecycle management

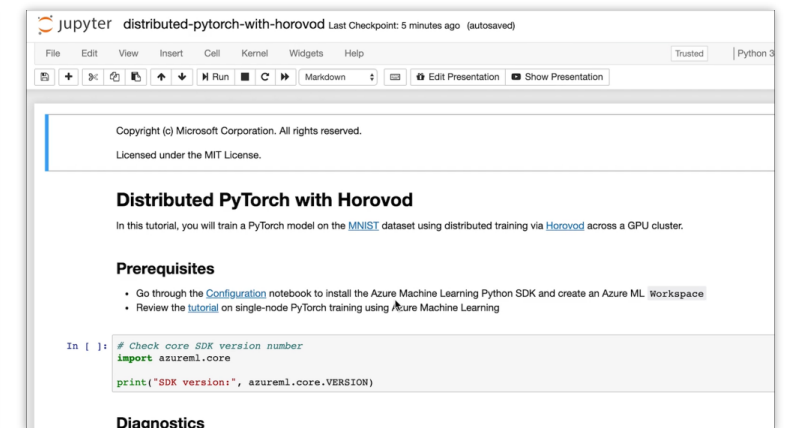
Simplify machine learning for any skill level



Automated
machine learning UI



Visual interface



Machine learning notebooks

Simplify machine learning for any skill level

Welcome to Automated Machine Learning

Getting Started

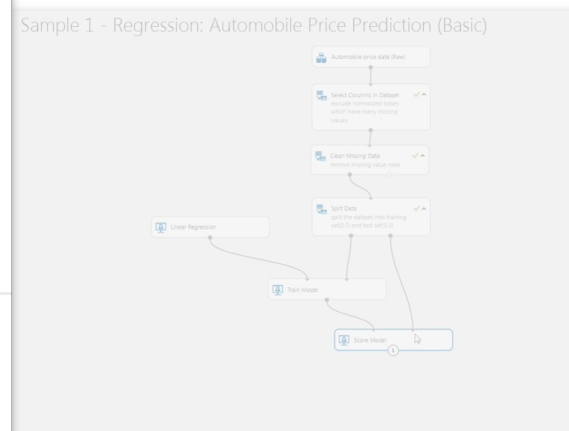
Create your first experiment with automated machine learning to produce quality models with zero effort.

[Create experiment](#)

What's Possible with Automated Machine Learning

Automate the process of algorithm selection, hyperparameter tuning, and best model selection with automated machine learning, and accelerate your productivity. Select your data and let automated ML do the rest to provide the best model from endless possible options.

Automated
machine learning UI



Visual interface

jupyter distributed-pytorch-with-horovod Last Checkpoint: 5 minutes ago (autosaved)

File Edit View Insert Cell Kernel Widgets Help Trusted Python 3

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Distributed PyTorch with Horovod

In this tutorial, you will train a PyTorch model on the [MNIST](#) dataset using distributed training via [Horovod](#) across a GPU cluster.

Prerequisites

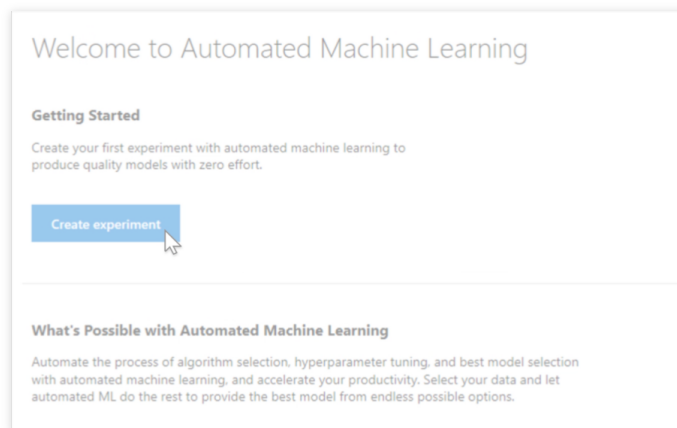
- Go through the [Configuration](#) notebook to install the Azure Machine Learning Python SDK and create an Azure ML Workspace
- Review the [tutorial](#) on single-node PyTorch training using Azure Machine Learning

```
In [ ]: # Check core SDK version number
import azureml.core
print("SDK version:", azureml.core.VERSION)
```

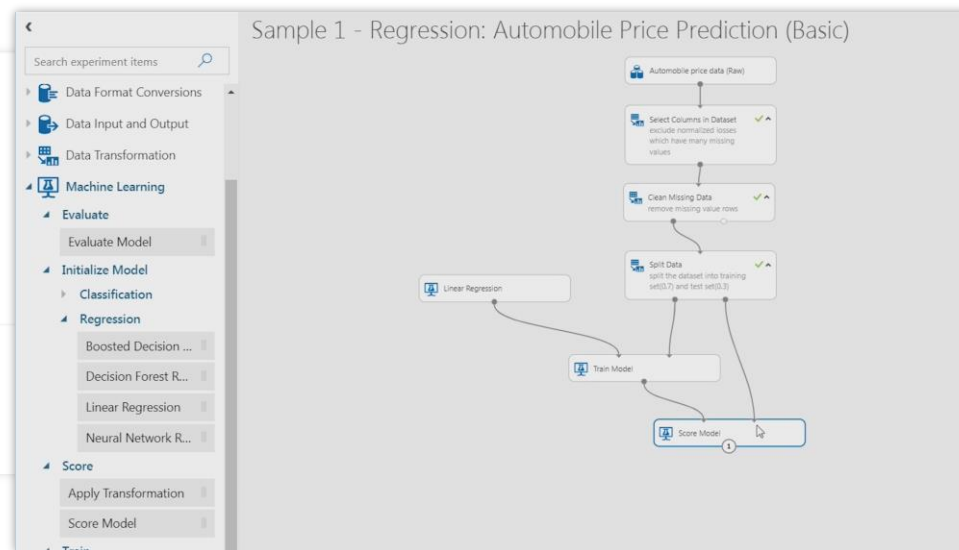
Diagnostics

Machine learning notebooks

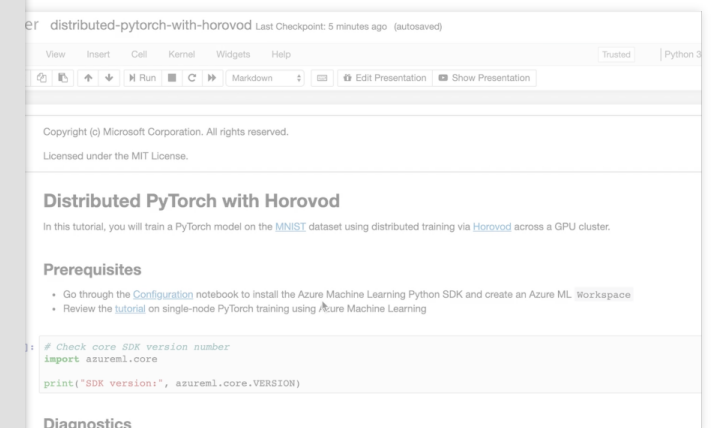
Simplify machine learning for any skill level



Automated machine learning UI

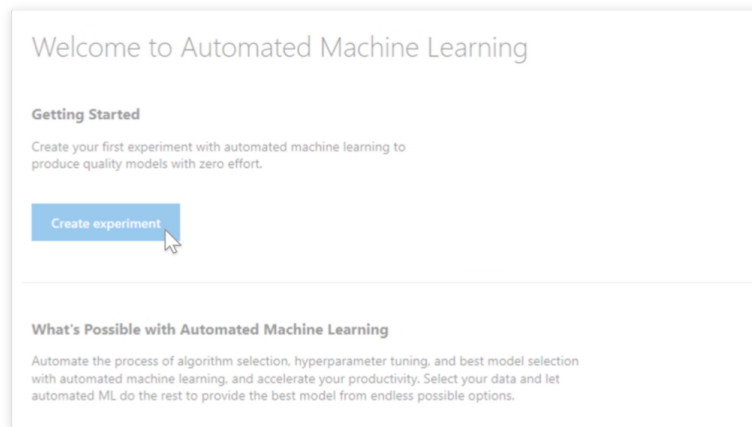


Visual interface

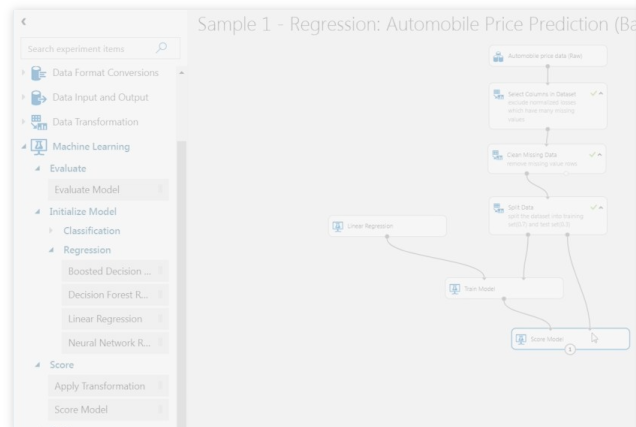


Machine learning notebooks

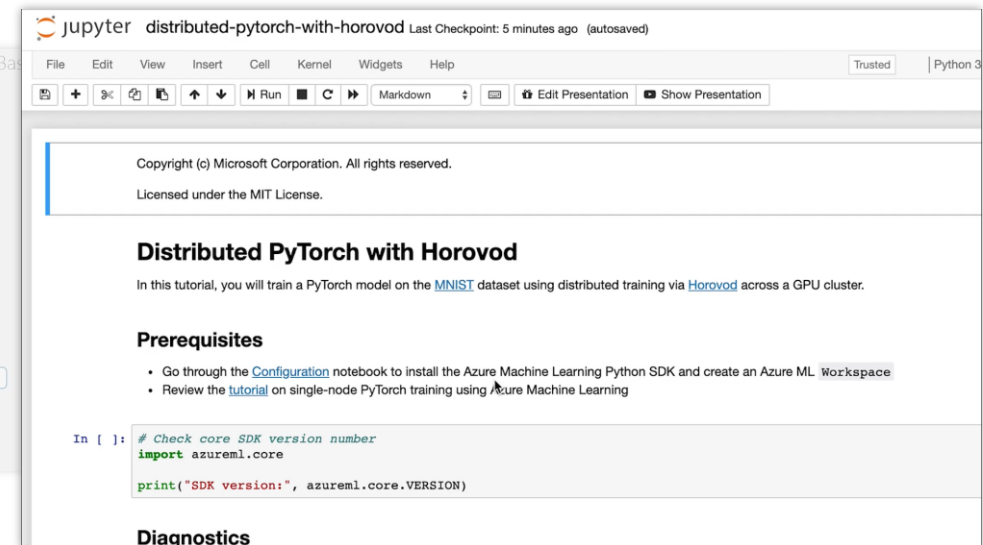
Simplify machine learning for any skill level



Automated machine learning UI

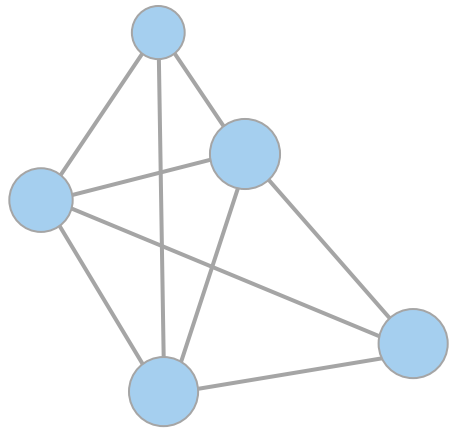


Visual interface

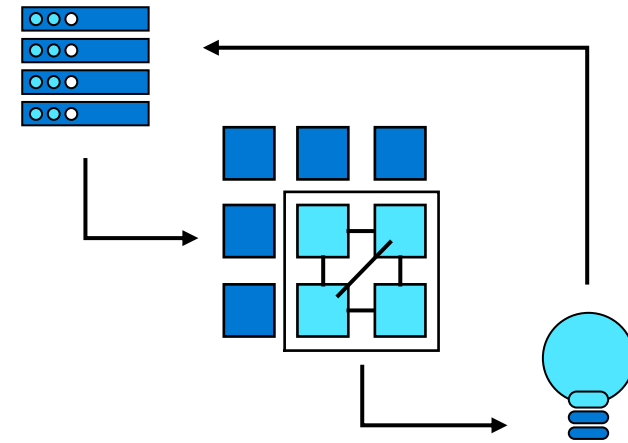


Machine learning notebooks

Azure Machine Learning Service



Simplified machine learning



End to end lifecycle management

DevOps



Code reproducibility



Code testing



App deployment

MLOps



Model reproducibility



Model validation

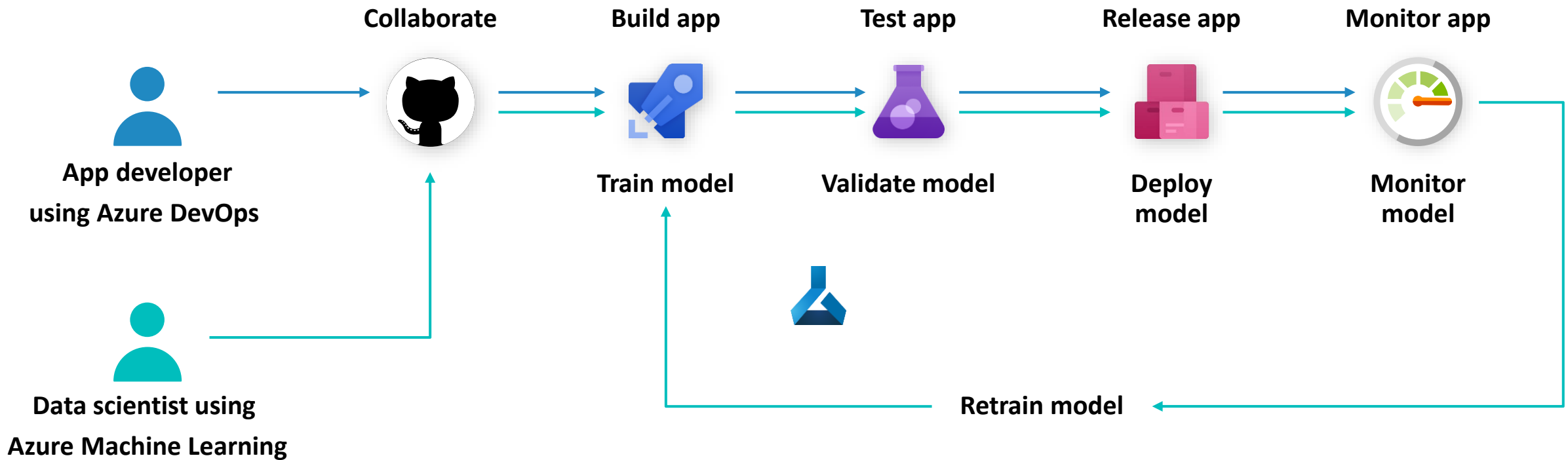


Model deployment



Model retraining

MLOPS with Azure Machine Learning



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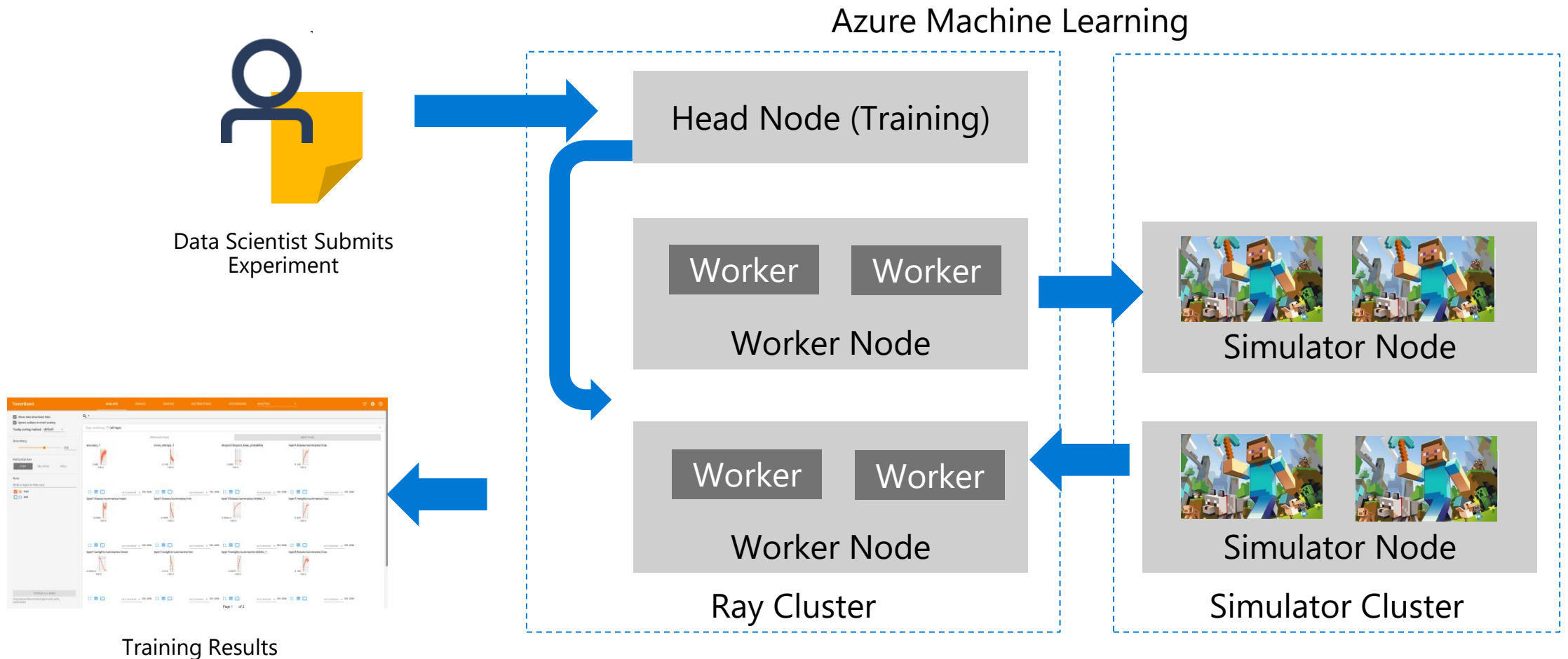
Learning RL with Minecraft on Azure



Goal: getting the Agent out of the maze



Training Agents on Azure Machine Learning



<https://aka.ms/MinecraftRLDemo>

On the right, you can see a video of the agent while he is training.

You can test your own Minecraft RL experiment using Azure Machine Learning Service.

Have fun 😊





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THANKS AND...

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ORGANIZATION



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SUPPORT

