

Machine Learning

Helping you from Scripting to Production



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THE BENEFITS OF THE CLOUD

THE DAWN OF ARTIFICIAL INTELLIGENCE



THE SPEED OF CHANGE



THE IMPORTANCE OF BUILDING



Azure AI

AI apps & agents



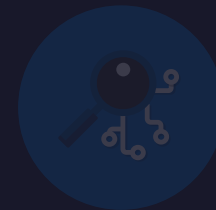
Azure Bot Service
Azure Cognitive Services

Machine learning



Azure Databricks
Azure Machine Learning

Knowledge mining



Azure Cognitive Search

Machine Learning on Azure

Sophisticated pretrained models

To simplify solution development



Vision

Cognitive Services



Speech



Language



Azure Search

Popular frameworks

To build advanced deep learning solutions



Pytorch



TensorFlow



Keras



Onnx

Productive services

To empower data science and development teams



Azure Databricks



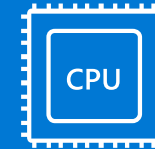
Azure Machine Learning



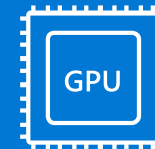
Machine Learning VMs

Powerful infrastructure

To accelerate deep learning



CPU



GPU



FPGA

Flexible deployment

To deploy and manage models on intelligent cloud and edge



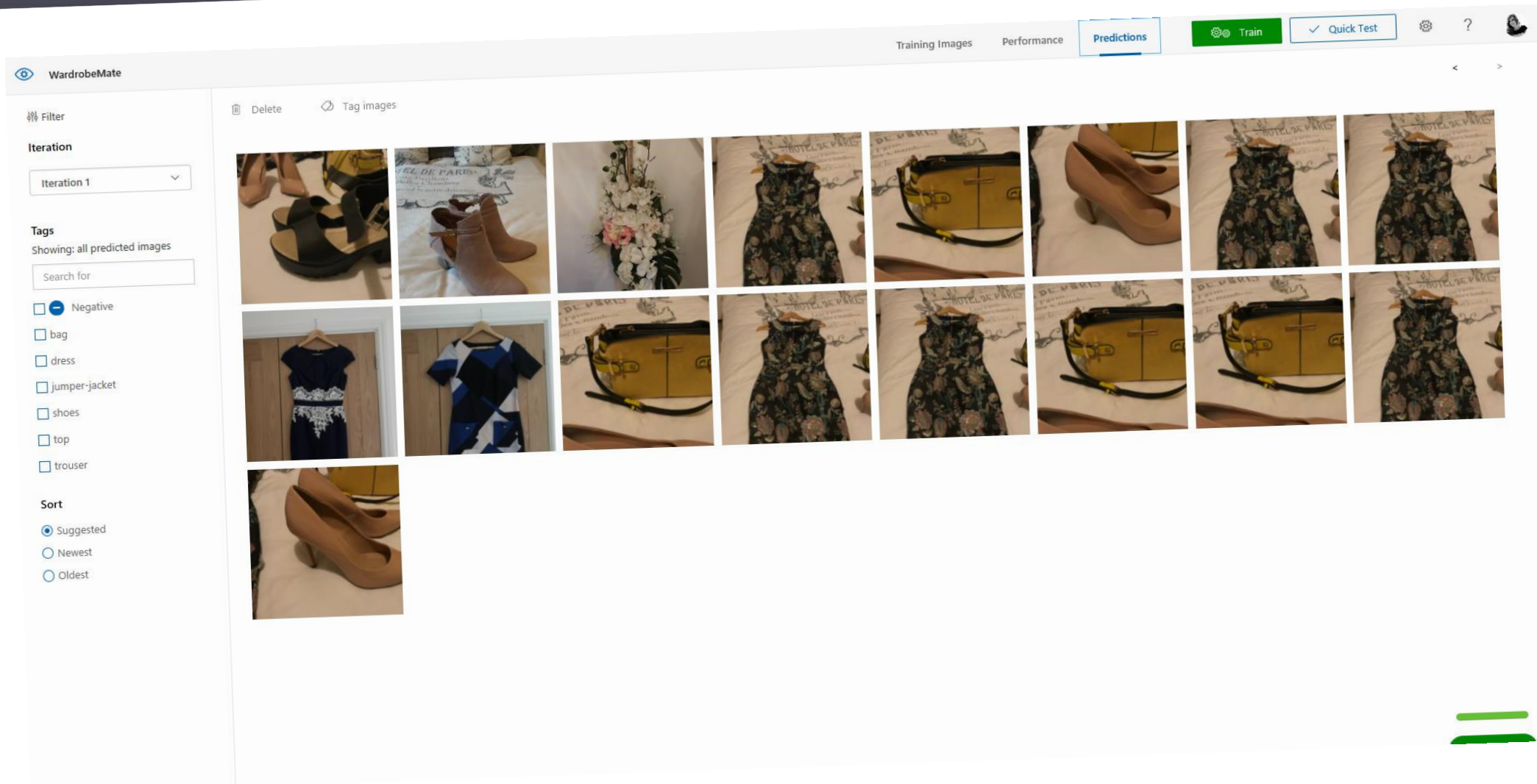
On-premises



Cloud



Edge



AZURE CUSTOM VISION

Cognitive Services: Key Takeaways

Dataset needed:

- Only test data or small amount of training data (30 images per category)

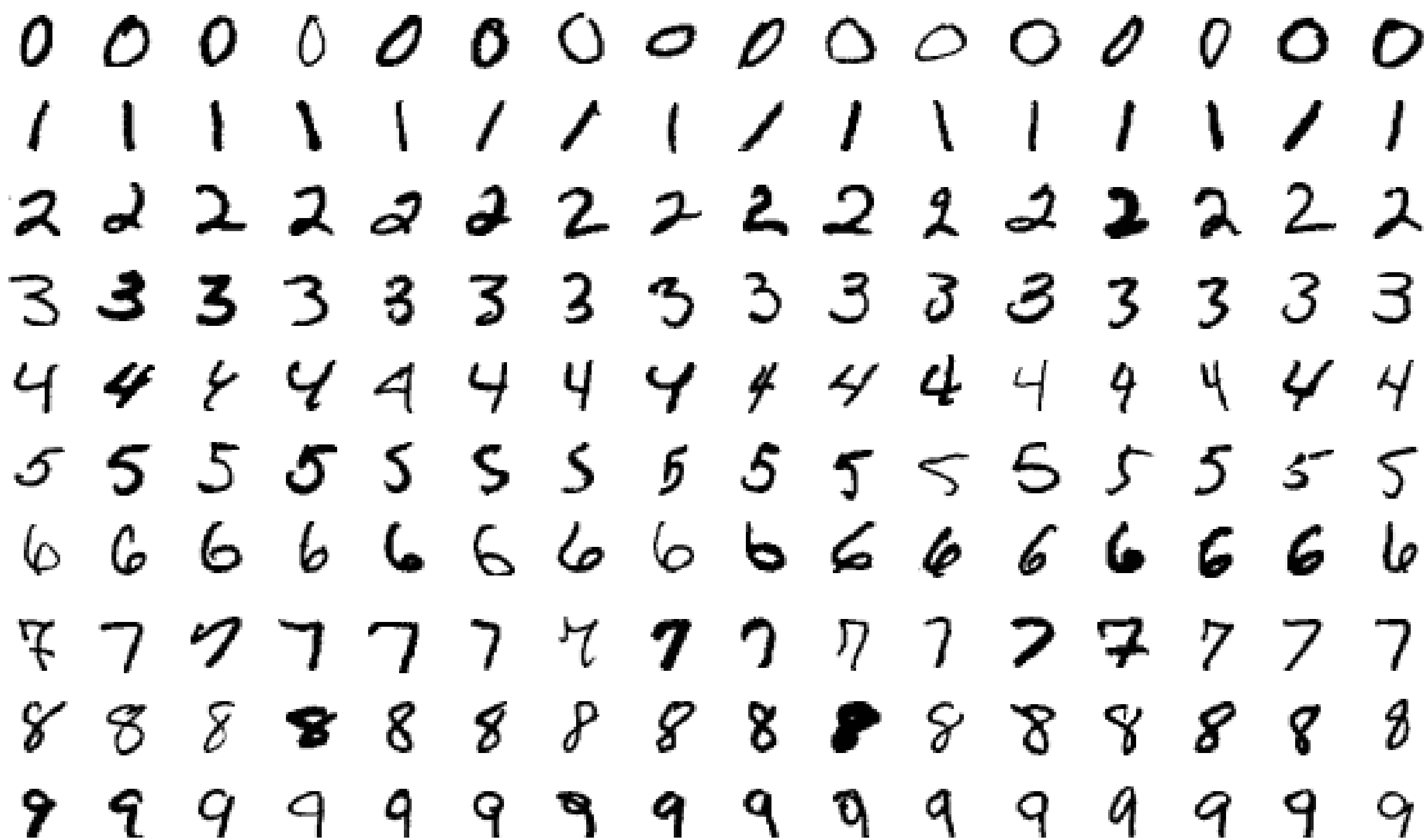
Compute needed:

- This is a platform-as-a-service (PaaS) offering, so training is taken care of as part of the service

Machine Learning Knowledge:

- None to basic understanding or learning





Automated ML: Key Takeaways

Dataset needed:

- More training samples needed to train a classification or regression algorithm (1000's to 10,000's)

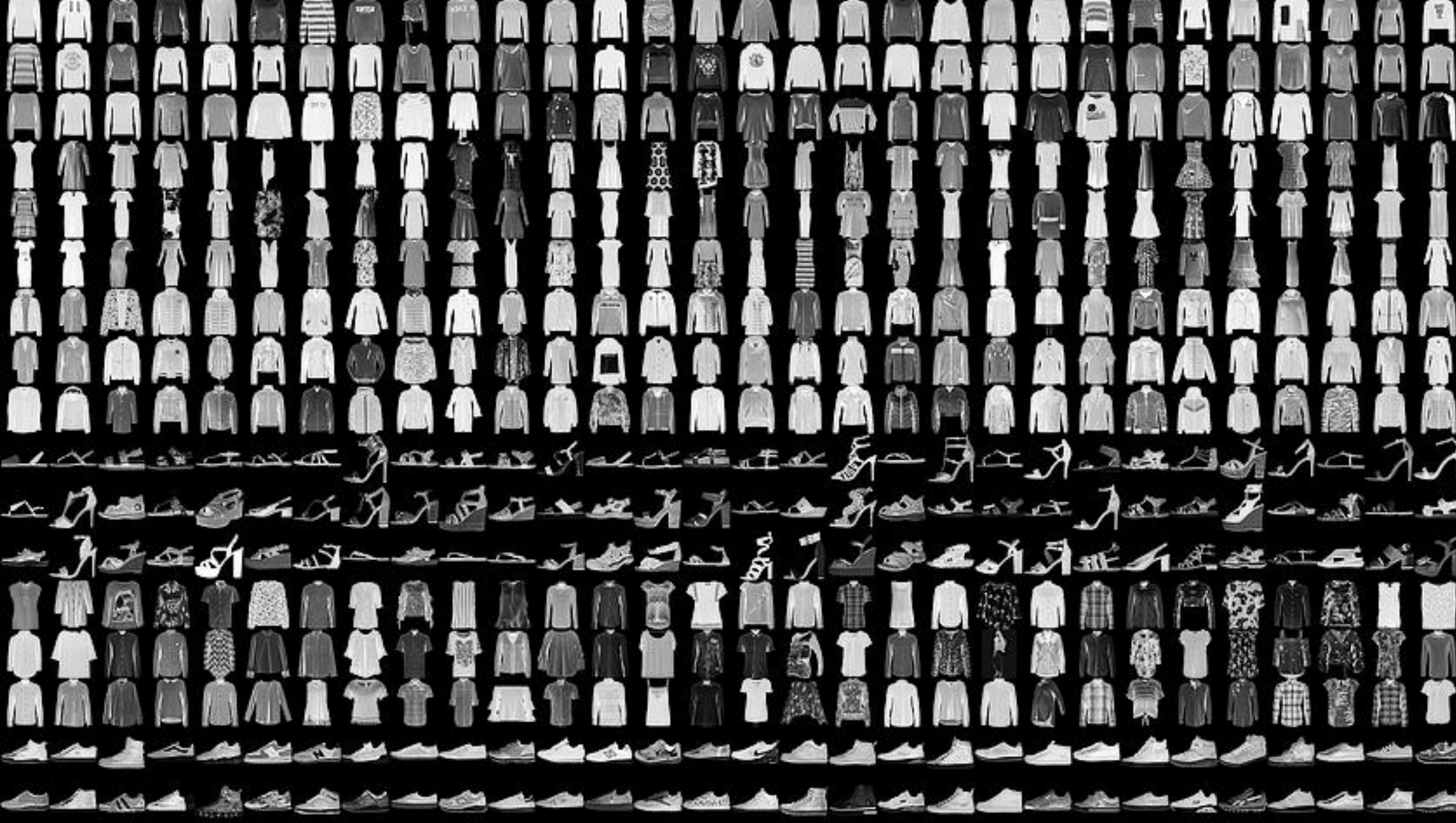
Compute needed:

- Ran in a Data Science VM (NC6) GPU series within a jupyter notebook

Machine Learning Knowledge:

- Python coding skills, and understanding data preparation and pandas dataframe and numpy arrays





• Add padding to each of the Conv2D layers: `model.add(Conv2D(32, kernel_size=(3,3), padding = 'same', activation = 'relu'))`

```
In [6]: #Define the CNN model
model = Sequential()

model.add(Conv2D(64, kernel_size=(3,3), activation = 'relu', input_shape=input_shape))
model.add(MaxPooling2D(pool_size=(2,2)))

model.add(Conv2D(64, kernel_size=(3,3), activation = 'relu'))
model.add(MaxPooling2D(pool_size=(2,2)))

model.add(Flatten())
model.add(Dense(128, activation='relu'))

#model.add(Dropout(0.5))
model.add(Dense(num_classes, activation='softmax'))

model.summary()
```

Layer (type)	Output Shape	Param #
conv2d_1 (Conv2D)	(None, 26, 26, 64)	640
max_pooling2d_1 (MaxPooling2D)	(None, 13, 13, 64)	0
conv2d_2 (Conv2D)	(None, 11, 11, 64)	36928
max_pooling2d_2 (MaxPooling2D)	(None, 5, 5, 64)	0

AZURE ML SDK – DEEP LEARNING

Deep Learning: Key Takeaways

Dataset needed:

- Large image dataset and preprocessing needed. Split between training, test and validation

Compute needed:

- Run larger algorithms on a Batch AI cluster of GPU machines in the cloud and remove compute after

Machine Learning Knowledge:

- A deeper understanding of both traditional and deep learning methods as well as frameworks such as Keras



“There are **many levels** of
machine learning available
using the cloud”

“I can **start simple** and
progress to more complex
models/datasets/scenarios”

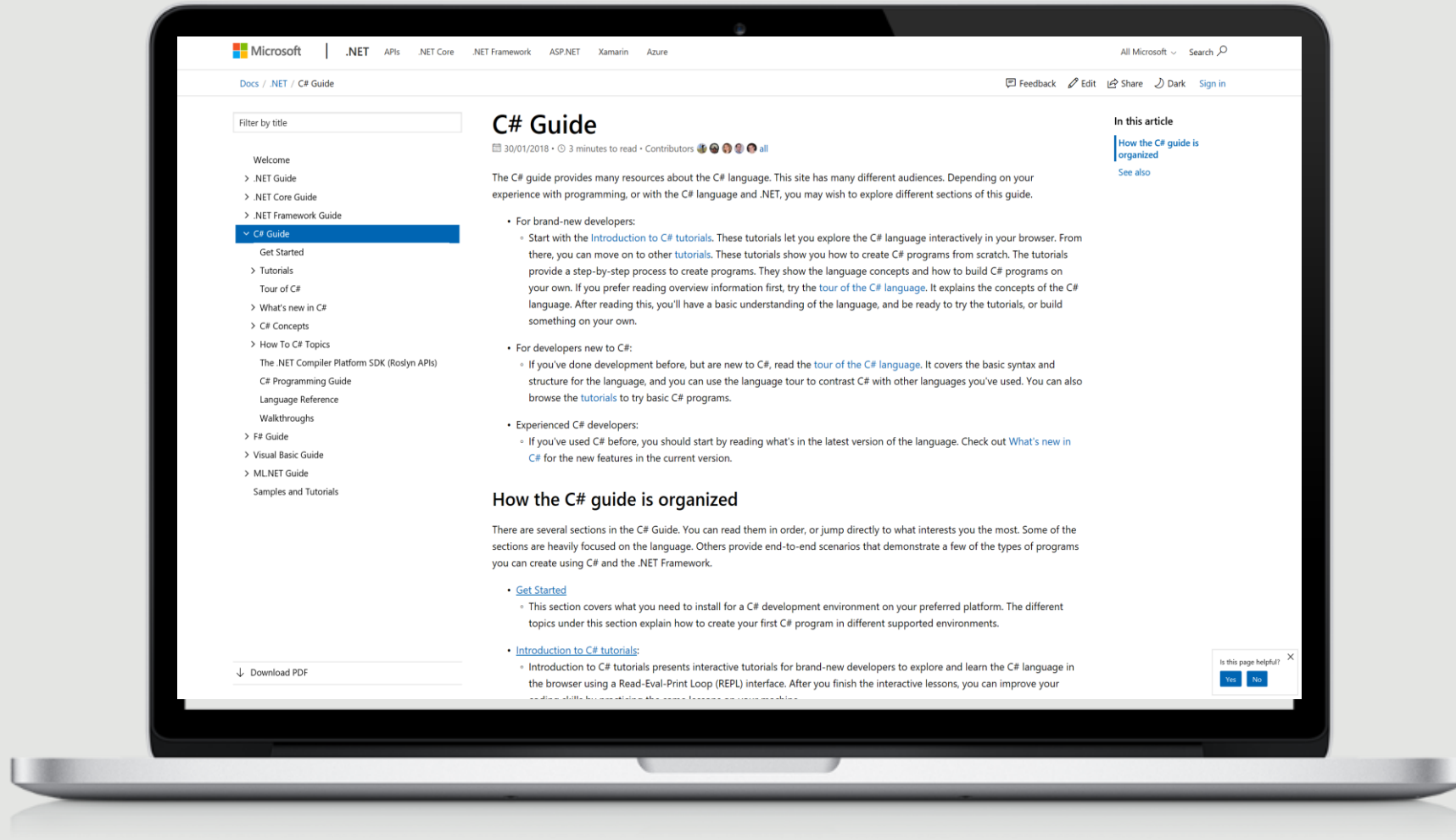
**“Start building and build
Proof of Concepts to test
your ideas and scenarios”**

ML: helping from scripting to production

- **Azure Custom Vision Service:**
<https://aka.ms/gaib-customvision>
- **Automated ML:**
<https://aka.ms/gaib-automatedml>
- **Azure ML SDK:**
<https://aka.ms/gaib-azureml>

Docs.microsoft.com

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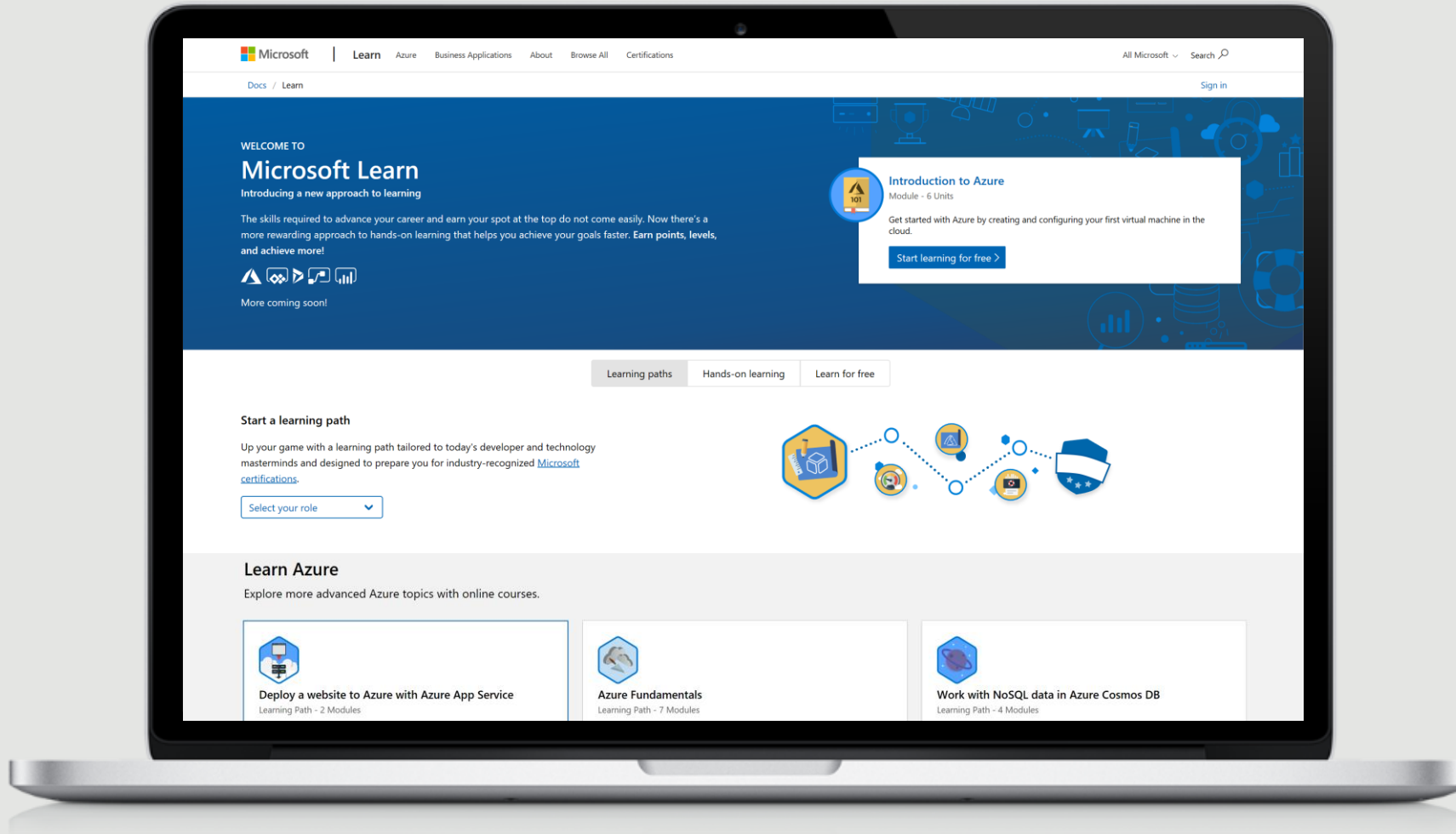
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