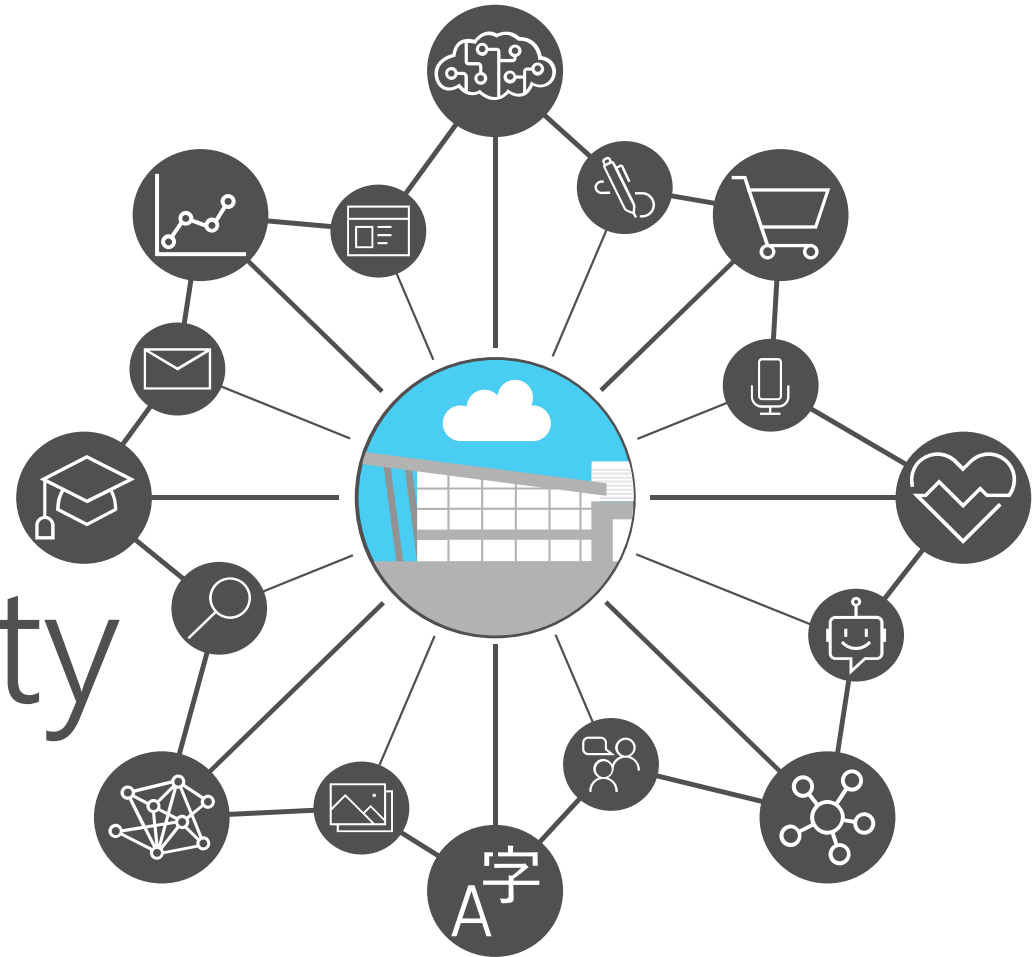


# Redmond Interoperability Plugfest 2018



## Artificial Intelligence: Changing the Game for Everyone



**Pele** changed the game of Soccer



Flatiron Building  
New York City  
1905





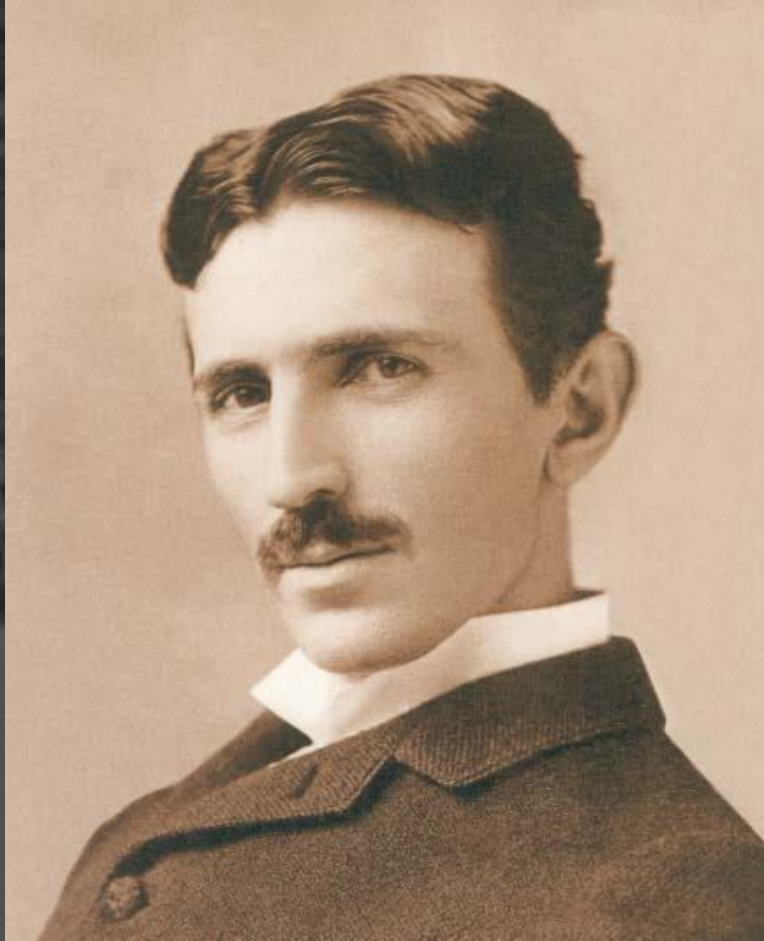
20 years later

Artifacts of the Industrial Revolution

Massachusetts Bay Transportation Authority  
Boston Subway 1897  
NY Subway 1904



**Thomas Edison**



**Nikola Tesla**



**Frank J Sprague**



## **The New Electricity**

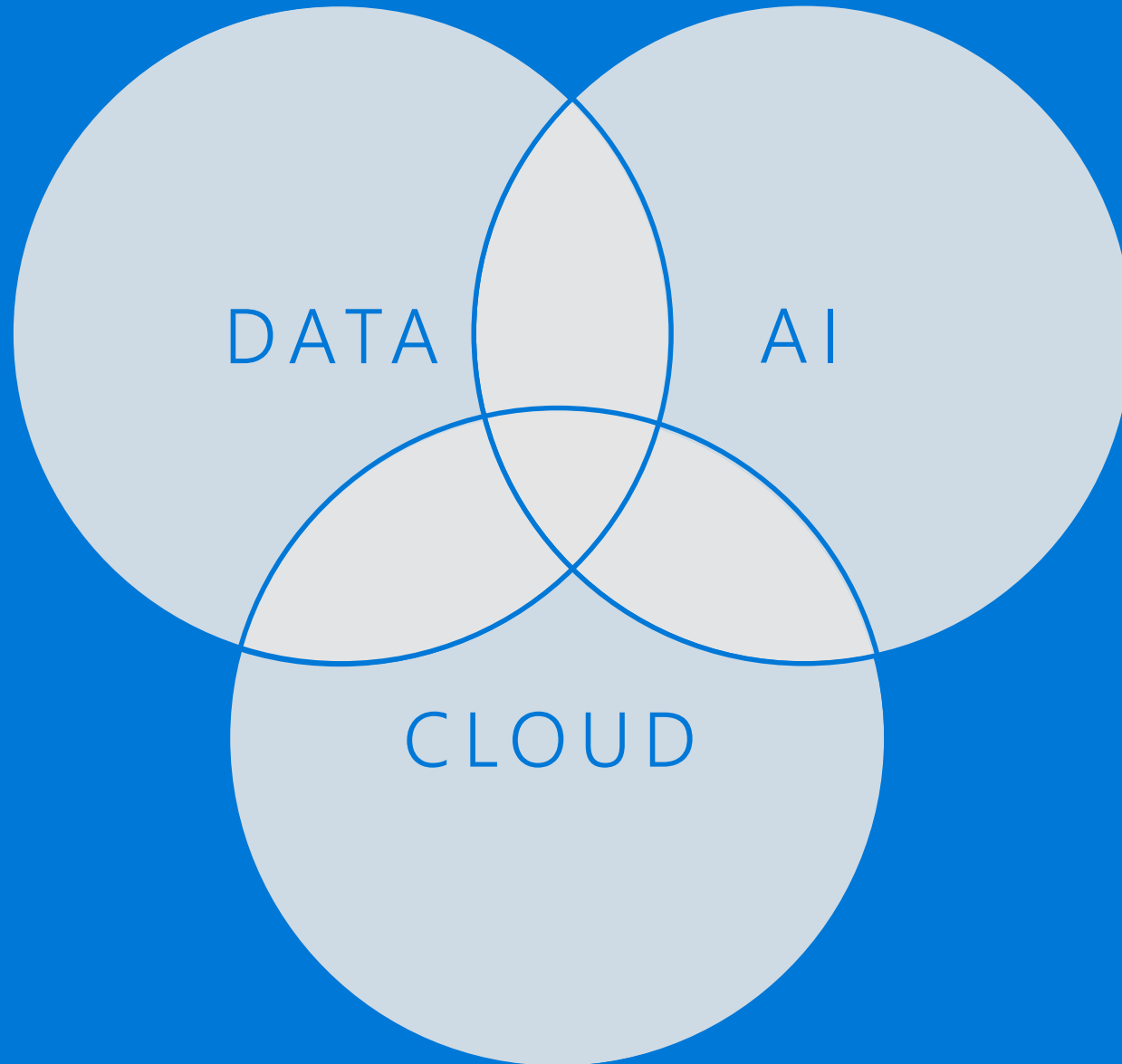
[Andrew Ng - The State of Artificial Intelligence](#)

Just as electricity transformed almost everything 100 years ago, today I actually have a hard time thinking of an industry that I don't think AI will transform in the next several years.

**- Andrew Ng**

<https://www.gsb.stanford.edu/insights/andrew-ng-why-ai-new-electricity>

# Organizations that harness data, cloud, and AI outperform

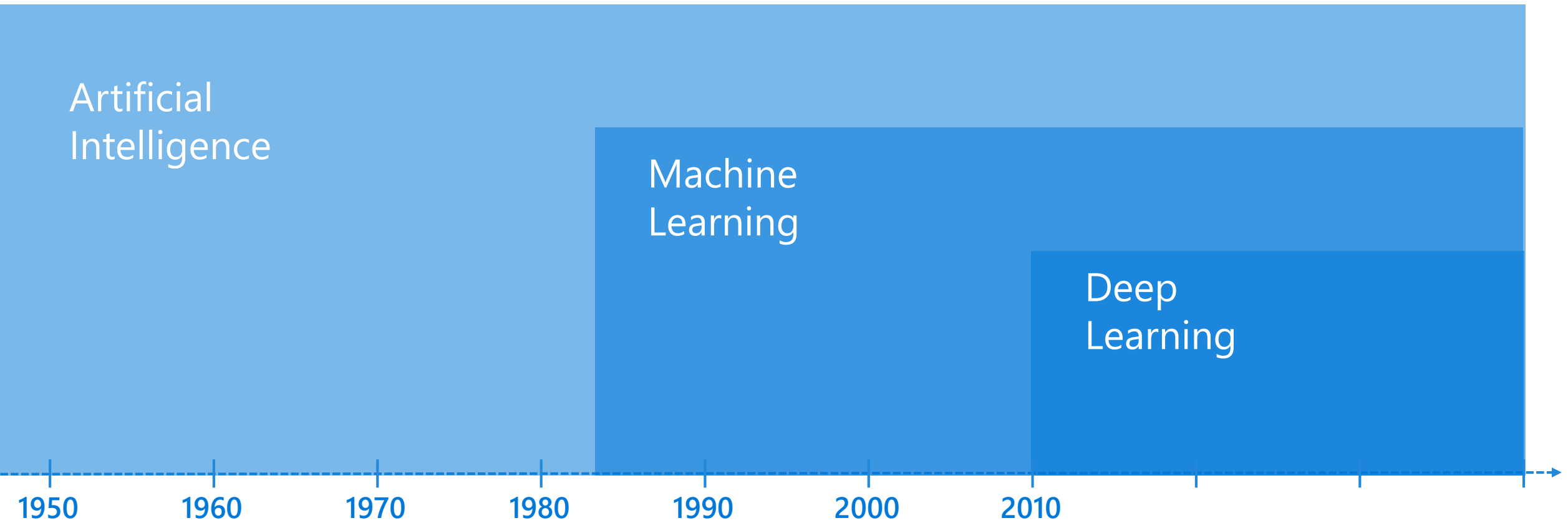








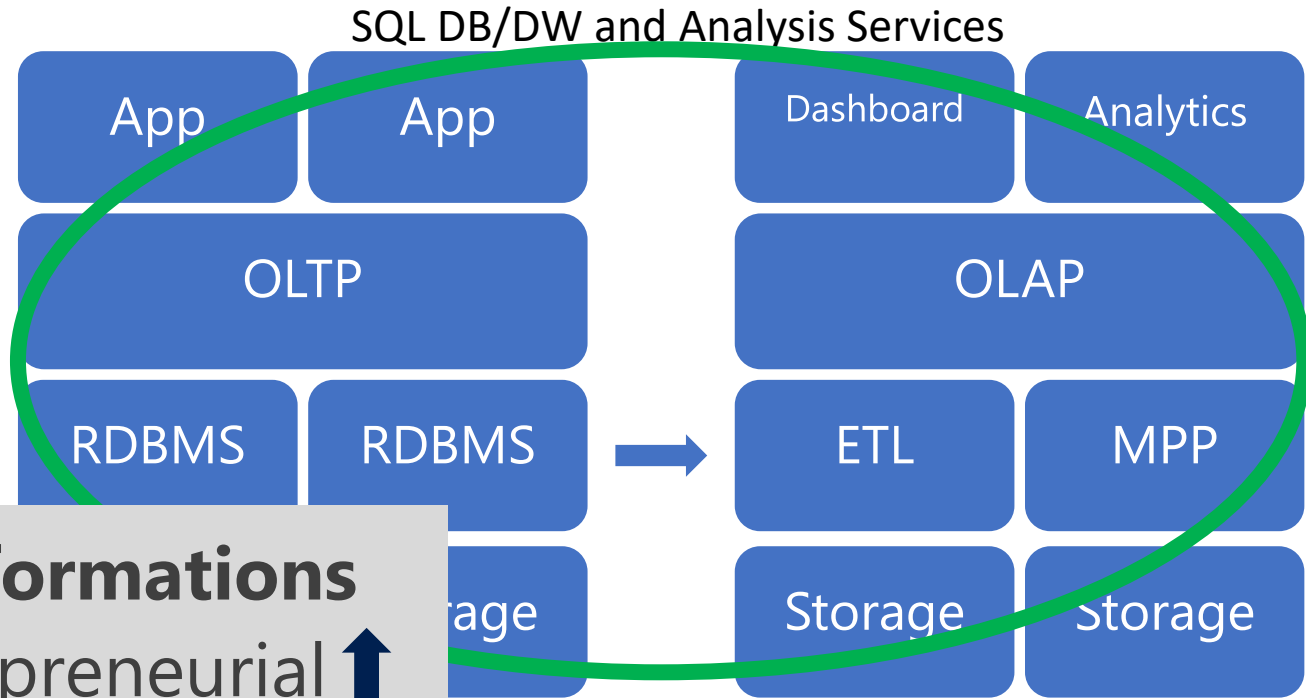
# AI, Machine Learning and Deep Learning



# AI is changing the game for everyone

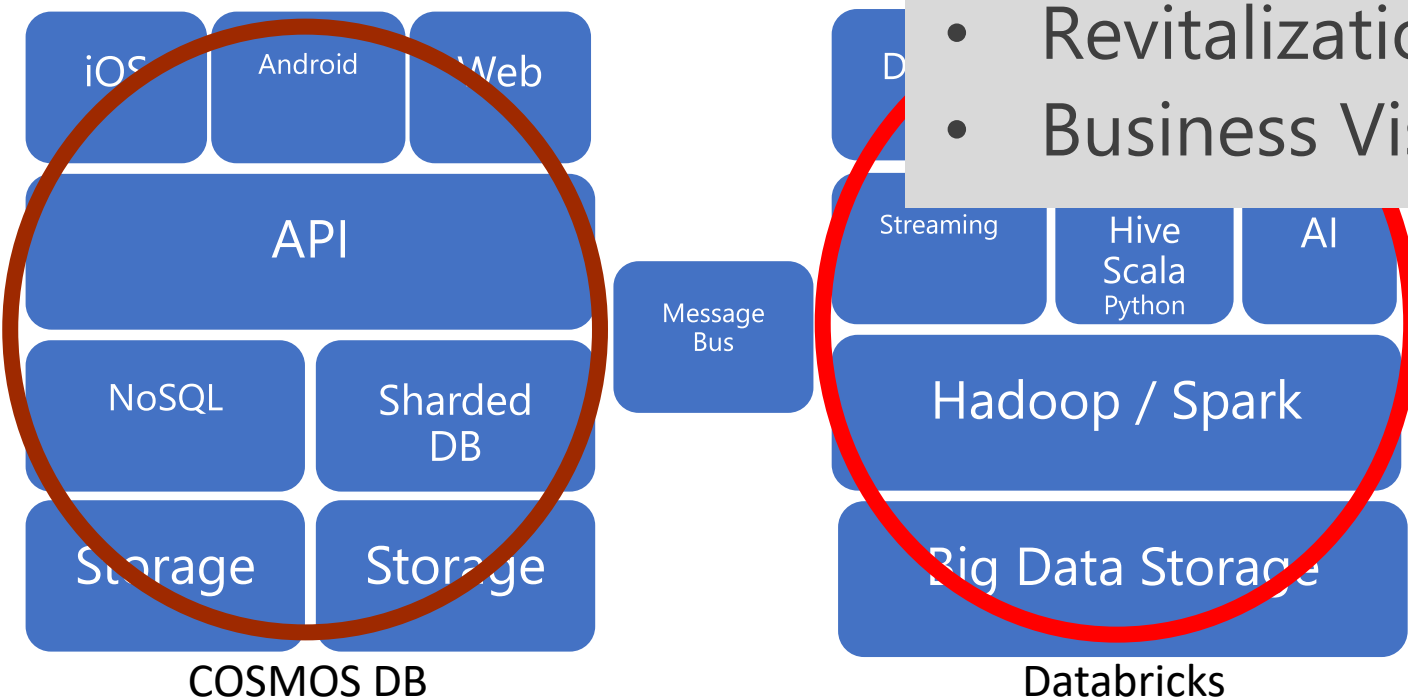
- **Classic and Cloud-born organizations**
- **Customers**
- **Partners**
- **Employees**
  - Managers
  - Customer-facing staff
  - Developers
  - Data Engineers
  - Data Scientists

# Classic Analytics Transaction-driven



**Transformations**

- Entrepreneurial ↑
- Revitalization ↓
- Business Vision ↔



# Cloud-born Analytics Event-driven

David Chaiken – Chief Architect at Pinterest



# The modern data estate



LOB



CRM



Graph



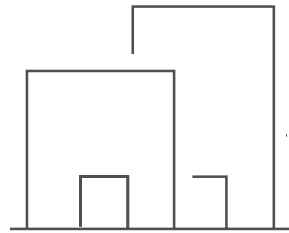
Image



Social



IoT



Operational databases  
Data warehouses  
Data Lakes

← Hybrid →



Operational databases  
Data warehouses  
Data Lakes

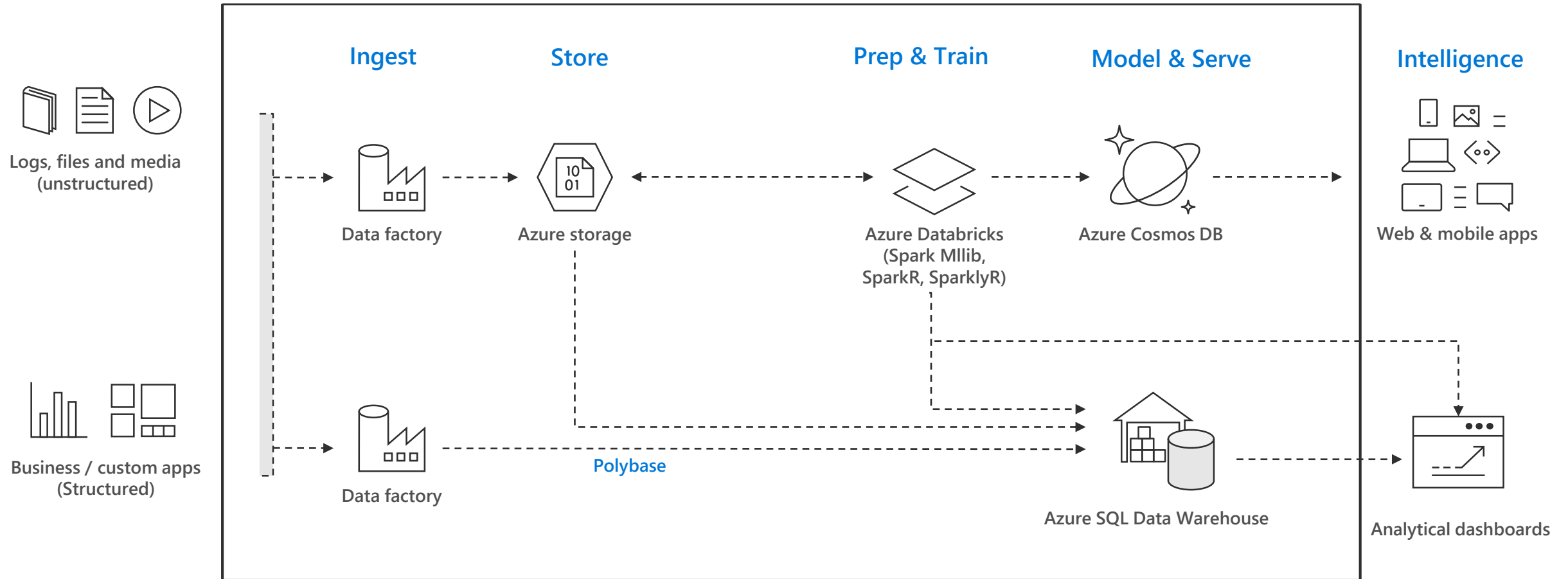
Reason over any data, anywhere

Flexibility of choice

Security and performance



# Advanced Analytics on Big Data



# The AI transformation



## Digital Agents

Transform your engagement with customers and employees



## Intelligent Apps

Leverage AI to create the future business applications



## Business processes

Transform critical business processes with AI

# Digital Agents

95%

Customer interactions  
powered by AI bots including  
telephone and online by 2025



## Engage customers

Build a loyal customer base  
with a 24/7 customer-centric  
approach to your business



## Empower employees

Increase employee productivity and  
allow for focus on innovation by  
freeing up time through automation



Litware Insurance

## Car Insurance

We offer different levels of coverage to respect your wallet, suit your lifestyle, and protect your vehicle.

Get Started

## Choose the right insurance



### Full Coverage

Coverage for accidents, natural disasters, fire, theft, damage to someone else's property, and



### Comprehensive Coverage

Coverage for accidents, natural disasters, fire, theft, damage to someone else's property



### Liability Coverage

Coverage for damage to someone else's

Live Chat





“By using Microsoft Azure Bot Service and Cognitive Services ... we’ve been able to continue our own Progressive journey of digital innovation and do it in an agile, fast, and cost-effective way.”

—Matt White: Marketing Manager, Personal Lines Acquisition Experience  
Progressive Insurance

“Our level of speed and agility would be very difficult to replicate with other tools. In the first four months ... we’ve updated the models at least 75 times. By using the Microsoft tools, we’re ensuring constant improvement and a better customer experience.”

—Matt White: Marketing Manager, Personal Lines Acquisition Experience  
Progressive Insurance



**PROGRESSIVE**®

# Demos Teams Who Bot

The screenshot displays the Microsoft Teams interface. At the top, there is a search bar with the text "Search or type a command". Below this, the "Who" bot is active, showing a profile card for Darwin Schweitzer. The profile card includes a circular profile picture, the name "Darwin Schweitzer", and his title "SR BUS STRATEGY MGR" at "Intelligent Cloud - Data & AI". His contact information, "REDW-B/2317" and "+1 (425) 7047946 X47946", is listed. Below the profile information are three buttons: "Manager", "Works with", and "Peers". The left sidebar contains navigation icons for Activity (with a notification badge), Chat, Teams, Store, and Feedback. At the bottom of the chat window, there is a text input field with the placeholder "Type your questions here" and a set of icons for adding attachments, emojis, GIFs, and more options.

# Intelligent apps

75%

Applications including AI

By 2018, 50% of apps will include some form of AI



## App innovation

Infuse AI into existing apps to improved user experience



## Knowledge extraction

Backend-infused applications will leverage latent value in content

# Microsoft Build 2018 – AI and JFK get the NBA out of its data swamp

 By [Stuart Lauchlan](#) May 8, 2018

**SUMMARY:** The NBA was sinking in a data swamp. The solution – a smart data platform and a dash of AI.



 0 Comments

According to Garth Case, Vice-President for IT at the National Basketball Association (NBA), after 20 years with the organization, there's one question that he gets asked all the time:

“ *Have I met Michael Jordan, Shaq, Kobe or LeBron? I'm lucky enough to say yes to all of that, I have.*



Garth Case

<https://diginomica.com/2018/05/08/microsoft-build-2018-nba-shoots-scores-digital/>



# JFK Files Demo



Documents revealed.  
Let's find out what happened that day.

SEARCH

[https://github.com/Microsoft/AzureSearch\\_JFK\\_Files](https://github.com/Microsoft/AzureSearch_JFK_Files)

# Transform you business processes

**85%**

**Enterprises embracing AI**

By 2020, 85% of Enterprises will be using AI on at least one process



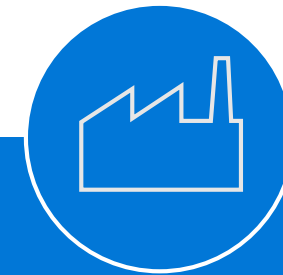
## Financial Services

Risk Analytics  
Fraud Prevention  
Customer Next Best Action



## Retail

Personalization  
Dynamic pricing  
Advanced retail planning



## Manufacturing

Predictive Maintenance  
Operations Automation  
Fleets management

# Transform your business processes

Industry  
verticals



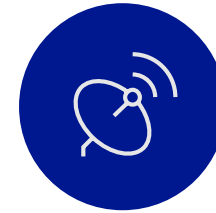
Banking



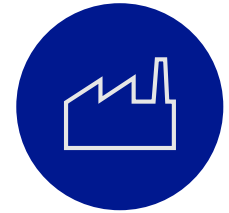
Health



Retail

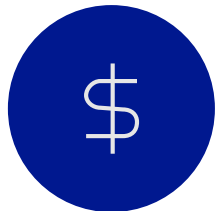


Telco



Manufacturing

Business  
processes



Sales



Marketing



Customer  
service



HR



Finance

# Azure Machine Learning Package for Forecasting



DOCS Windows Microsoft Azure Visual Studio Office More ▾

Docs / Python reference for Azure Machine Learning

Azure Machine Learning Packages

▾ Forecasting

> ftk

> Computer Vision

> Text Analytics

## Azure Machine Learning Package for Forecasting

📅 05/07/2018 • ⌚ 6 minutes to read • Contributors

The Azure Machine Learning Package for Forecasting (AMLPF) is a Python package for creating and deploying forecasting models using a high-level Python API.

The AMLPF package supports the following scenarios:

- Financial forecasting
- Demand forecasting

<https://docs.microsoft.com/en-us/python/api/overview/azure-machine-learning/forecasting-overview?view=azure-ml-py-latest>

# MICROSOFT AI PLATFORM

## Azure AI Services

### PRE-BUILT AI

Cognitive Services

### CONVERSATIONAL AI

Bot Service

### CUSTOM AI

Azure Machine Learning

### CODING & MANAGEMENT TOOLS

VS Tools  
for AI

Azure ML  
Studio

Azure ML

Others (PyCharm, Jupyter Notebooks...)

## Azure Infrastructure

### AI ON DATA

### AI COMPUTE

Cosmos  
DB

SQL  
DB

SQL  
DW

Data  
Lake

Spark

DSVM

Batch  
AI

ACS

IoT  
Edge

CPU, FPGA, GPU

### DEEP LEARNING FRAMEWORKS

3rd Party

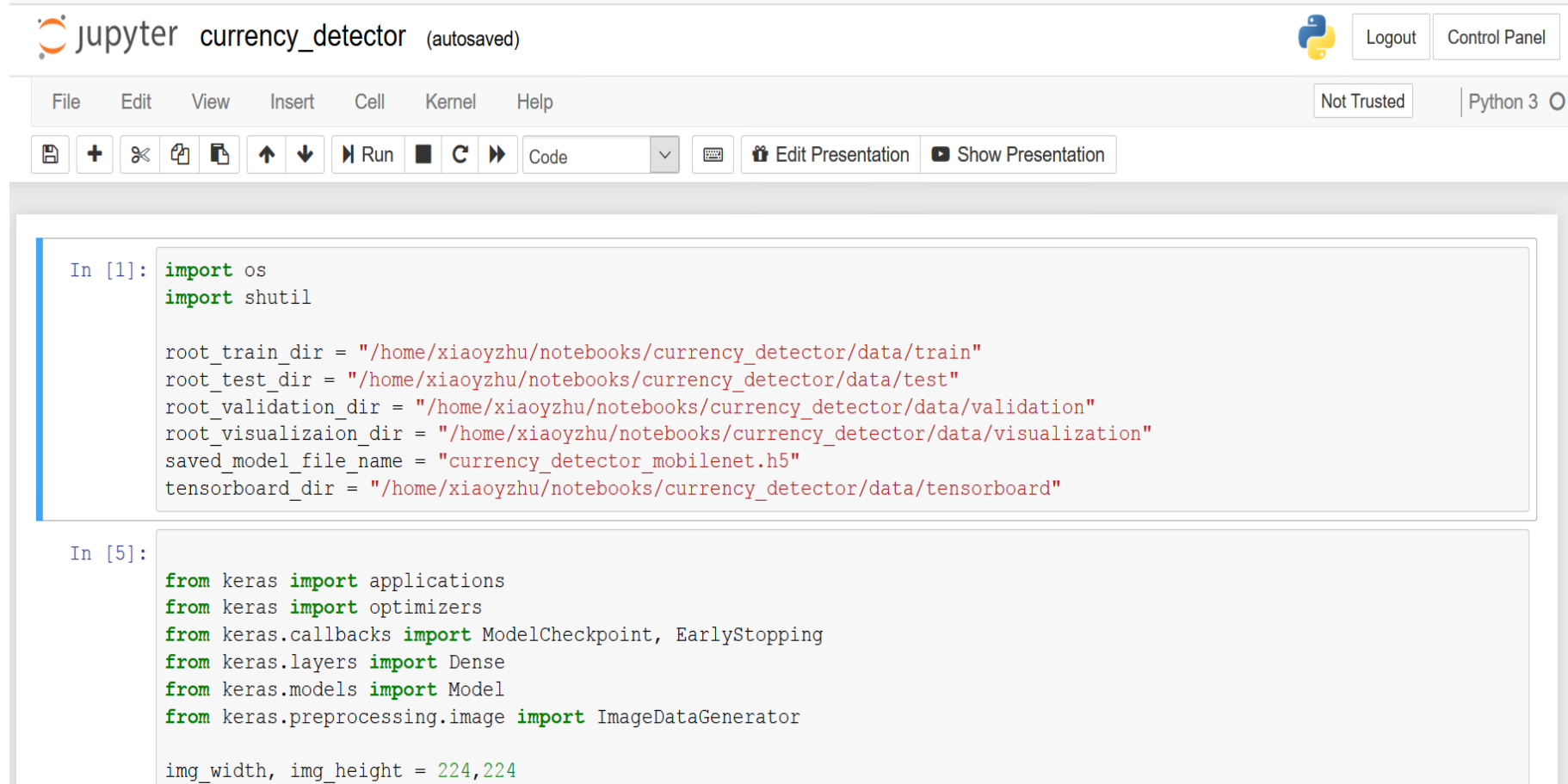
Cognitive  
Toolkit

TensorFlow

Caffe

Others (Scikit-learn, MXNet, Keras,  
Chainer, Gluon...)

# Jupyter Notebooks



The screenshot shows a Jupyter Notebook interface with the following elements:

- Header:** "jupyter currency\_detector (autosaved)" on the left, and "Logout" and "Control Panel" buttons on the right.
- Menu Bar:** "File", "Edit", "View", "Insert", "Cell", "Kernel", "Help".
- Toolbar:** Includes icons for saving, adding, deleting, copying, pasting, undo, redo, and running code. It also shows "Code" as the selected kernel language, "Not Trusted" status, and "Python 3" version.
- Code Cells:**
  - In [1]:** Imports `os` and `shutil`, and defines several directory paths:

```
root_train_dir = "/home/xiaoyzhu/notebooks/currency_detector/data/train"
root_test_dir = "/home/xiaoyzhu/notebooks/currency_detector/data/test"
root_validation_dir = "/home/xiaoyzhu/notebooks/currency_detector/data/validation"
root_visualizaion_dir = "/home/xiaoyzhu/notebooks/currency_detector/data/visualization"
saved_model_file_name = "currency_detector_mobilenet.h5"
tensorboard_dir = "/home/xiaoyzhu/notebooks/currency_detector/data/tensorboard"
```
  - In [5]:** Imports various Keras modules:

```
from keras import applications
from keras import optimizers
from keras.callbacks import ModelCheckpoint, EarlyStopping
from keras.layers import Dense
from keras.models import Model
from keras.preprocessing.image import ImageDataGenerator

img_width, img_height = 224,224
```



# Visual Studio Tools for AI

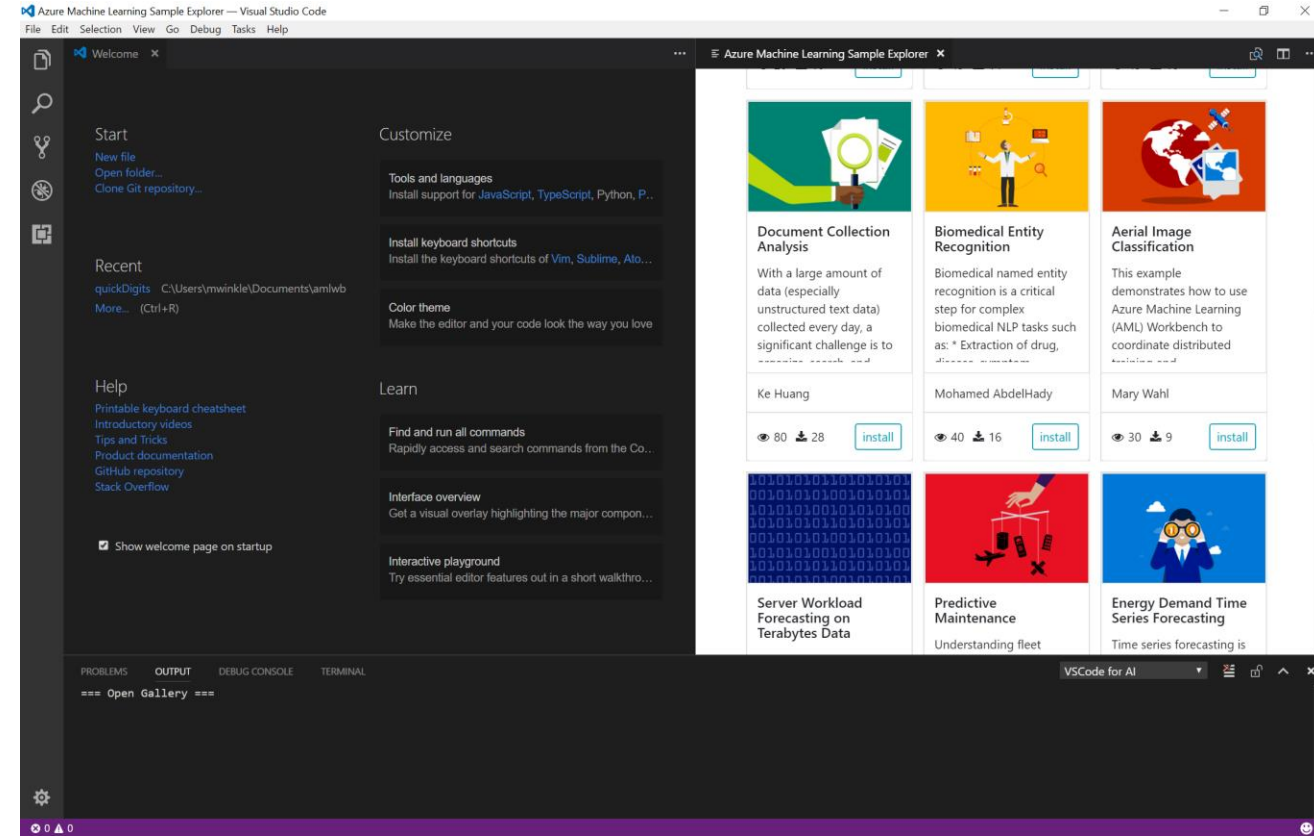
Visual Studio extension with deep integration to Azure ML

End to end development environment, from new project through training

Support for remote training

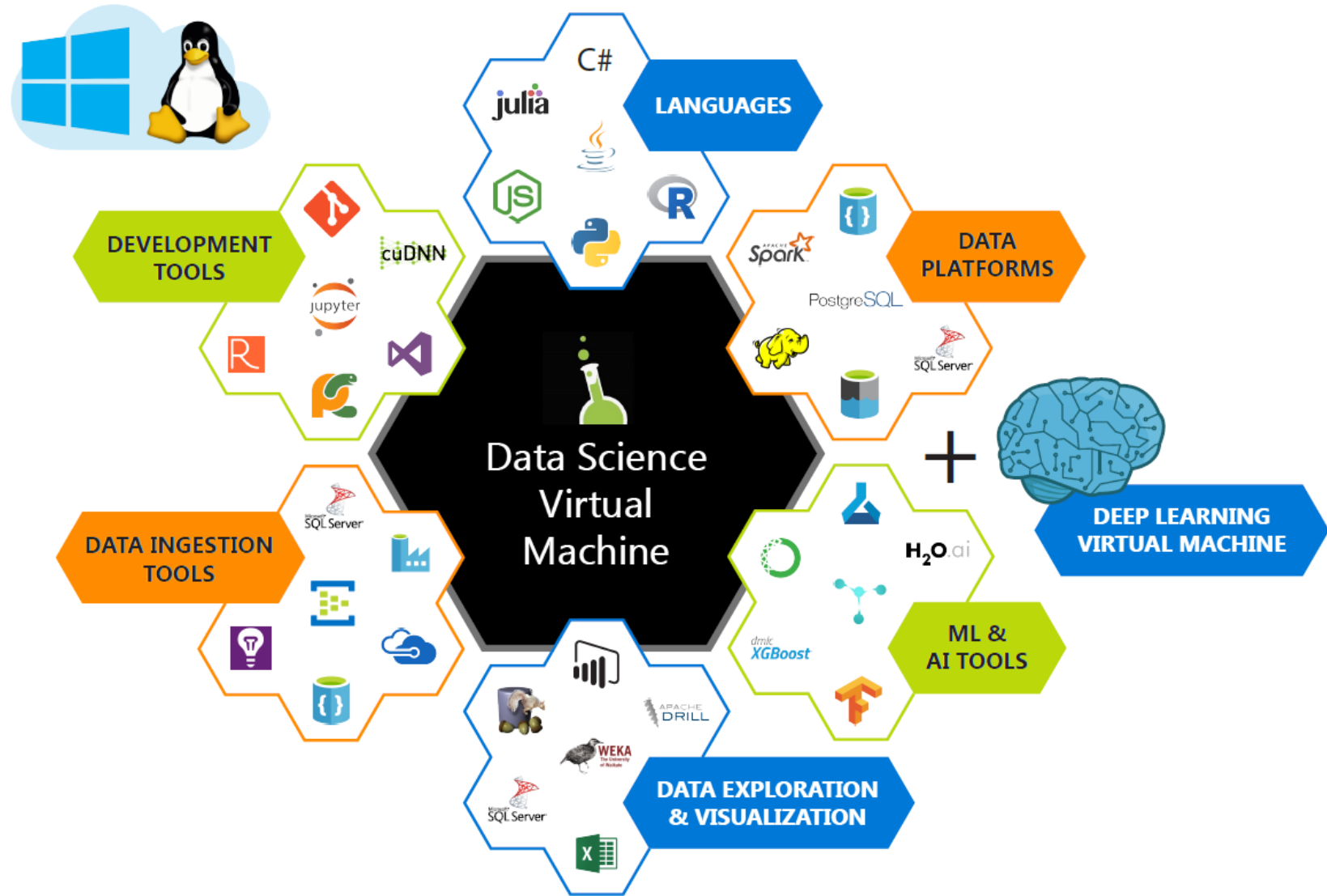
Job management

On top of all of the goodness of Visual Studio (Python, Jupyter, Git, etc)



# Data Science Virtual Machines (DSVM)

*Pre-Configured  
environments in the  
cloud for  
Data Science & AI  
Modeling,  
Development &  
Deployment.*

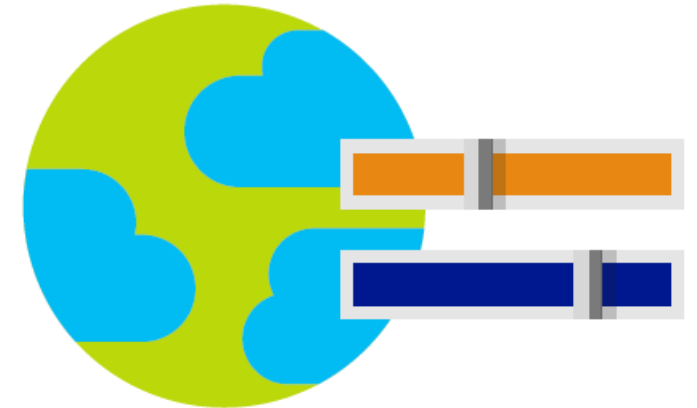




Analytics desktop in the cloud



Data science training and education



On-demand elastic capacity

## Why Data Science VMs ?



Examples & Templates  
to get started



Deep Learning with GPUs



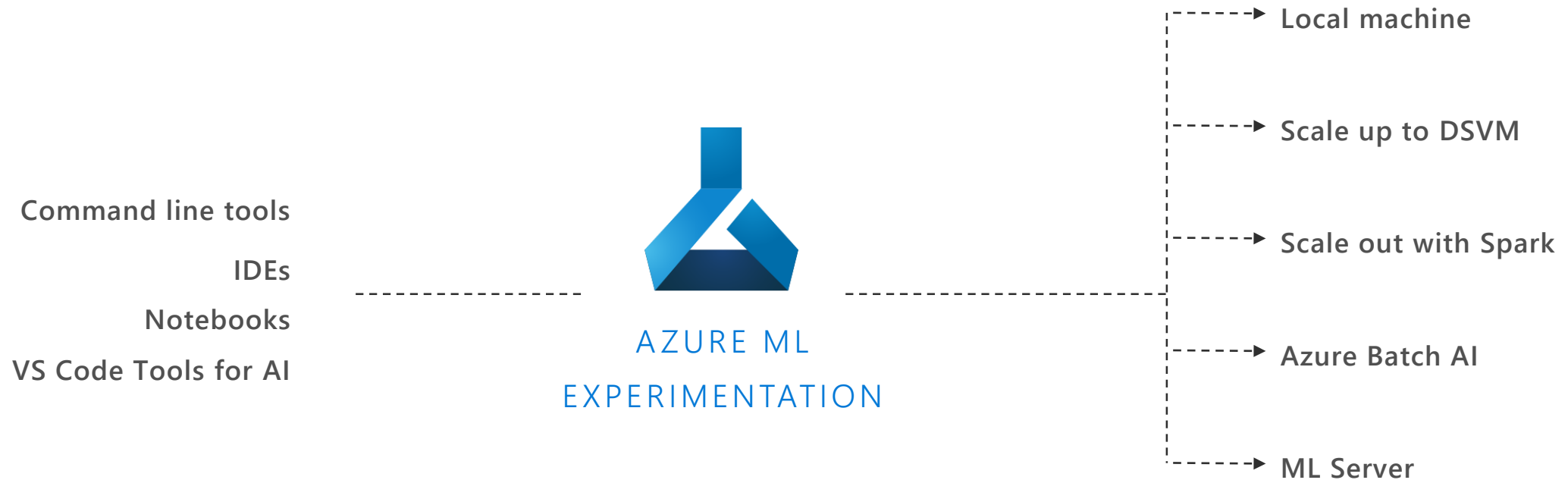
Highly Parallelized scalable AI  
Training with Azure Batch

# Azure Databricks Notebooks

The screenshot displays the Azure Databricks notebook interface. At the top left, the Microsoft Azure logo is visible. The notebook title is "ReadTweetsFromEventHub (Scala)". The interface includes a sidebar with navigation icons for Azure Databricks, Home, Workspace, Recent, Data, Clusters, Jobs, and Search. The main workspace area shows two command blocks. The first command block, labeled "Cmd 1", contains a text prompt: "Enter the ConnectionStingBuilder Event Hub Endpoint <IngestConnectionString> and set the Event Hub Name <IngestEventHubName>". The second command block, labeled "Cmd 2", contains the following Scala code:

```
1 import org.apache.spark.eventhubs._
2
3 // Build connection string with the above information
4 val connectionString = ConnectionStringBuilder("<IngestConnectionString>")
5 // ("Endpoint=sb://test15gjacp5rwrplhceservicebusingest.servicebus.windows.net/;SharedAccessKeyName=RootMana
6   .setEventHubName("<IngestEventHubName>")
7   .build
8
9 val customEventhubParameters =
10   EventHubsConf(connectionString)
11   .setMaxEventsPerTrigger(5)
12
13 val incomingStream = spark.readStream.format("eventhubs").options(customEventhubParameters.toMap).load()
14
15 incomingStream.printSchema
16
17 // Sending the incoming stream into the console.
18 // Data comes in batches!
19 incomingStream.writeStream.outputMode("append").format("console").option("truncate", false).start()
```

# Experiment Everywhere

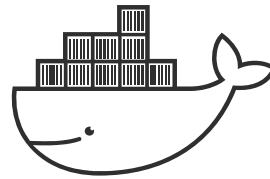


# Deploy Everywhere



AZURE ML

MODEL MANAGEMENT



DOCKER



- Single node deployment (cloud/on-prem)
- Azure Kubernetes Service (AKS)
- Azure IoT Edge
- Microsoft ML Server
- Spark clusters
- SQL Server





# Azure IoT Edge



Move cloud and custom workloads to the edge, securely



Seamless deployment of AI and advanced analytics



Configure, update and monitor from the cloud



Compatible with popular operating systems



Code symmetry between cloud and edge for easy development and testing



Secure solution from chipset to cloud

# Azure IoT edge

---

## Cloud services at the edge

Azure ML, Azure Stream Analytics, Azure Functions, custom

---

---

## Manage from the cloud

Devices and services from Azure Portal

---

---

## Flexible connectivity

Intermittent, low, or no connectivity

---

---

## Reduced latency and cost

Bring compute to the data, reduced bandwidth cost

---

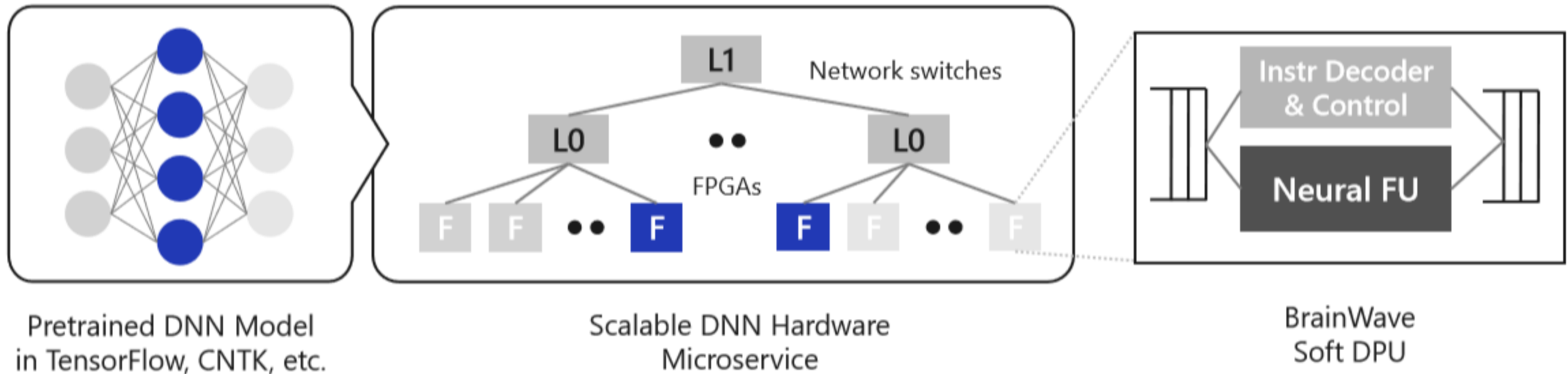
# Project BrainWave

## A Scalable FPGA-Powered DNN Serving Platform

**Fast:** Ultra-low latency, high-throughput serving of DNN models at low batch sizes

**Flexible:** Future proof, adaptable to fast-moving AI space and evolving model types

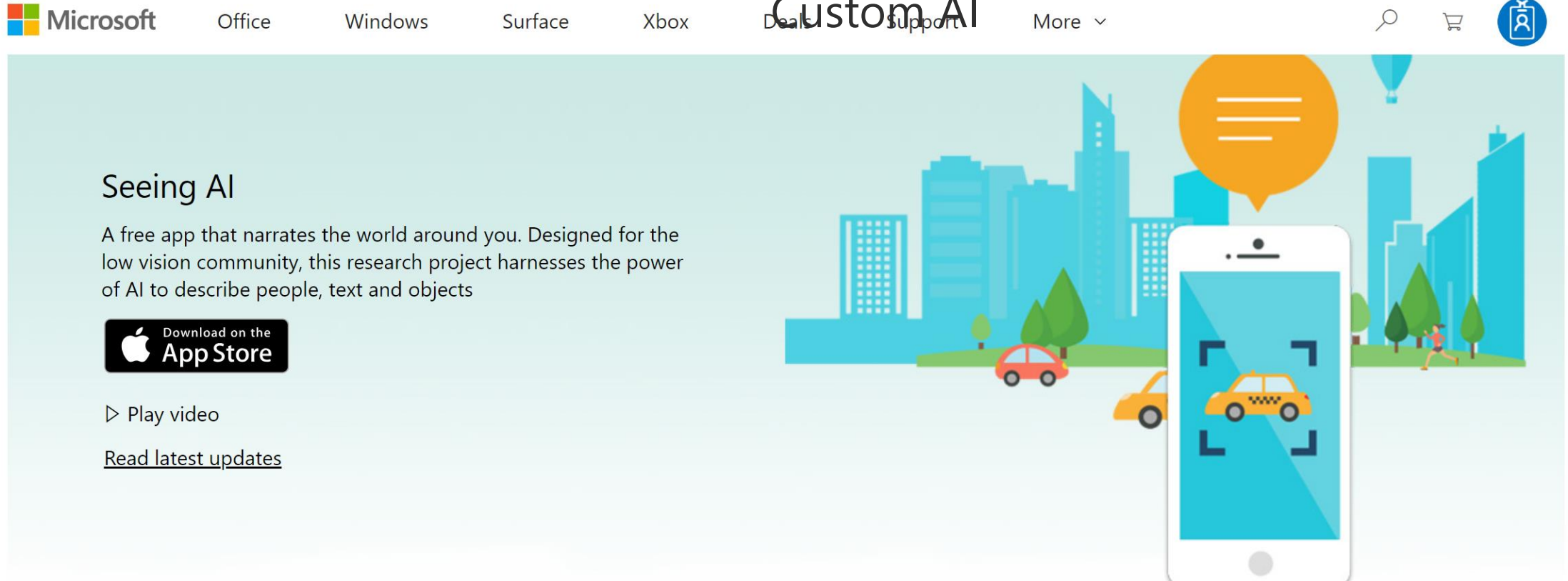
**Friendly:** Turnkey deployment of TensorFlow/CNTK/Caffe/etc.



# Seeing AI - Play Video

Please attend my Data Science VM Lab  
Looking at Currency Detector Deep  
Learning


Custom AI



Microsoft Office Windows Surface Xbox Deals Support More

## Seeing AI

A free app that narrates the world around you. Designed for the low vision community, this research project harnesses the power of AI to describe people, text and objects

 Download on the App Store

▶ Play video

[Read latest updates](#)

## Complete multiple tasks with one app

Switch between channels to tune the description of what's in front of the camera.

<https://www.microsoft.com/en-us/seeing-ai/>

# Transform individuals to transform business

**Accelerate learning** and using Try → Learn → Build:

## Try

- Demos (IDEA)
  - Introduce
  - Demo
  - Explain
  - Attend

## Learn

- GitHub Samples
- Solution Templates
- Data Science VM

## Build

- Documentation & Solution Architectures

<https://github.com/Azure/data-ai-iot>

Readiness for Data and AI and IoT

32 commits   1 branch   0 releases   3 contributors   MIT

Commit	Author	Time
FixTypo	DataSnowman	a month ago
GeoAI	DataSnowman	a month ago
ChestXrayAndQuickstartFixes	DataSnowman	a month ago
Couple more adds	DataSnowman	8 days ago
Couple more adds	DataSnowman	8 days ago
DSVM Links	DataSnowman	7 days ago



Transformation of individuals → teams → organizations

# Q & A

**Darwin Schweitzer** | WW INTELLIGENT CLOUD – Big Data / AI Advanced Workload Lead  
Worldwide Commercial Business (WCB) – Intelligent Cloud  
(425) 638-9068 | [darsch@microsoft.com](mailto:darsch@microsoft.com) | [@DataSnowman](https://twitter.com/DataSnowman) | GitHub [DataSnowman](https://github.com/DataSnowman)  
Please check out Data and AI and IoT resources at <https://github.com/Azure/data-ai-iot>





