

NOVA

IMS

Information
Management
School

AI

Artificial Intelligence

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AI – Microsoft AI Overview

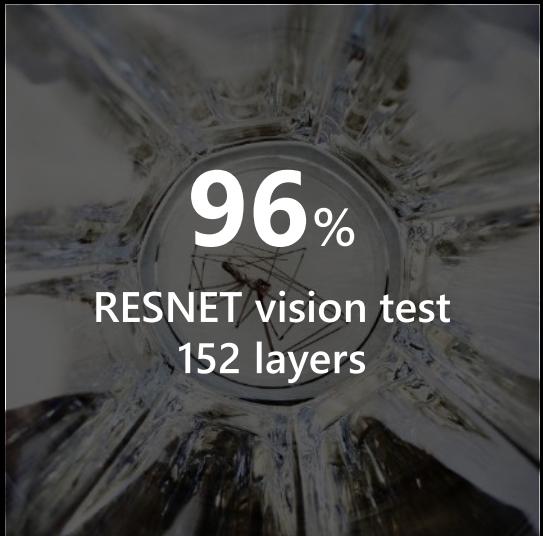


A close-up, profile shot of Satya Nadella, Microsoft's CEO. He is wearing blue-rimmed glasses and a dark blue shirt. He is gesturing with his right hand, pointing his index finger upwards, while holding a white Microsoft remote control in his left hand. The background is dark.

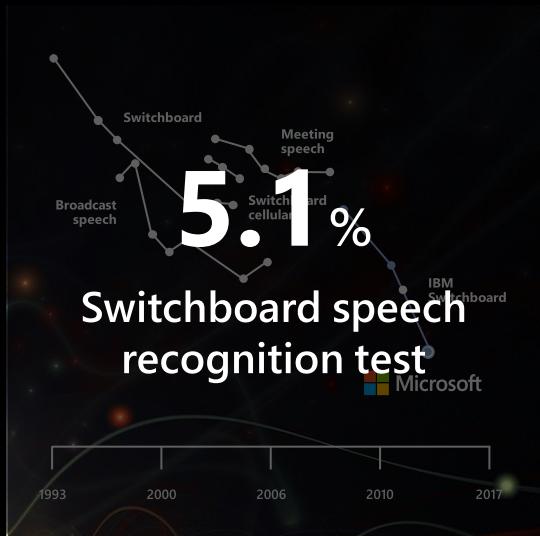
Our strategy is to build best-in-class platforms and productivity services for an intelligent cloud and an intelligent edge infused with artificial intelligence (“AI”).

Microsoft AI breakthroughs

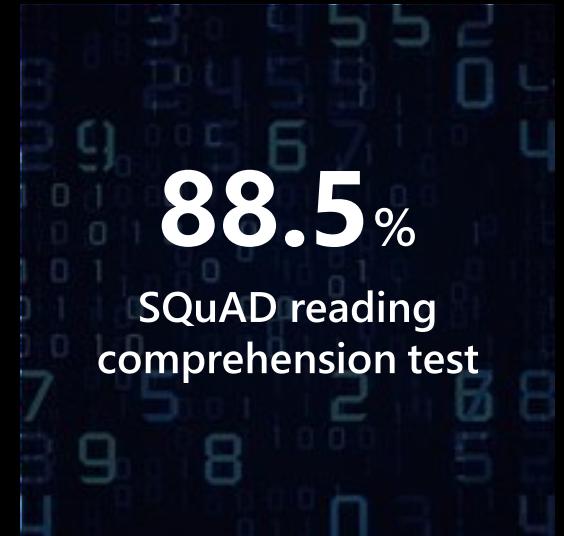
Vision



Speech



Language



2016

Object recognition
Human parity

2017

Speech recognition
Human parity

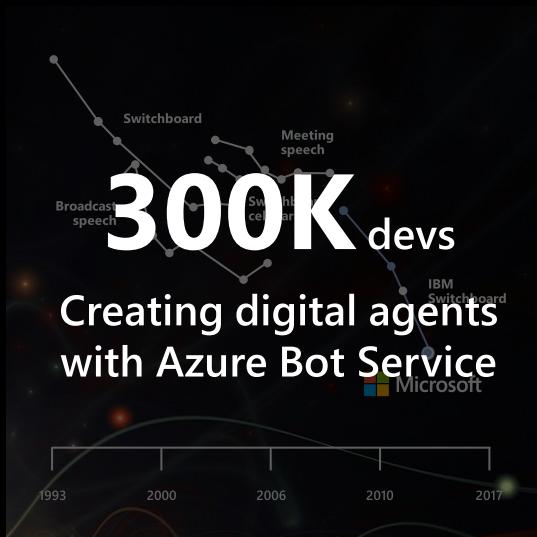
March 2018

Machine translation
Human parity

January 2018

Machine reading comprehension
Human parity

Microsoft AI Momentum



Artificial Intelligence

Machine Learning

Deep Learning

Generative AI



Artificial Intelligence

the field of computer science that seeks to create intelligent machines that can replicate or exceed human intelligence



Machine Learning

subset of AI that enables machines to learn from existing data and improve upon that data to make decisions or predictions



Deep Learning

a machine learning technique in which layers of neural networks are used to process data and make decisions



Generative AI

Create new written, visual, and auditory content given prompts or existing data.

How the tech behind ChatGPT could change the world—an

[How the tech behind ChatGPT could change the world—an updated episode from our archive | The Economist](#)

OpenAI's new DALL-E model draws anything—but bigger, better and faster than before

[dall-e | TechCrunch](#)

A.I. Can Now Write Its Own Computer Code. That's Good News for Humans.

[A.I. Can Now Write Its Own Computer Code. That's Good News for Humans. - The New York Times \(nytimes.com\)](#)

Microsoft Bets Big on the Creator of ChatGPT in Race to Dominate A.I.

[Microsoft Bets Big on the Creator of ChatGPT in Race to Dominate A.I. - The New York Times \(nytimes.com\)](#)

ChatGPT has given everyone a glimpse at AI's astounding progress

[OpenAI's ChatGPT is a fascinating glimpse into the scary power of AI - Vox](#)

GPT-3: We're at the very beginning of a new app ecosystem

[GPT-3: We're at the very beginning of a new app ecosystem | VentureBeat](#)



*Ensure that artificial
general intelligence (AGI)
benefits humanity.*



*Empower every person and
organization on the planet
to achieve more*

GPT-3

Generate and Understand Text

Codex

Generate and Understand Code

DALL·E

Generate images from text prompts



Generative AI

GPT-3

Prompt:

Write a tagline for an ice cream shop.

Response:

We serve up smiles with every scoop!

Codex

Prompt:

```
Table customers, columns =  
[CustomerId, FirstName,  
LastName, Company, Address,  
City, State, Country,  
PostalCode]
```

Create a SQL query for all customers in Texas named Jane
query =

Response:

```
SELECT *  
FROM customers  
WHERE State = 'TX' AND  
FirstName = 'Jane'
```

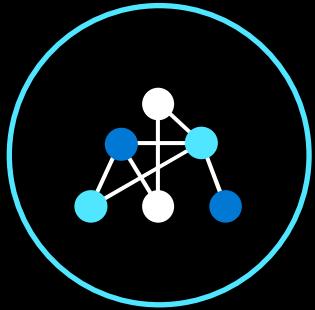
DALL·E

Prompt: A white Siamese cat

Response:



Azure AI



Machine learning



AI apps & agents



Knowledge mining

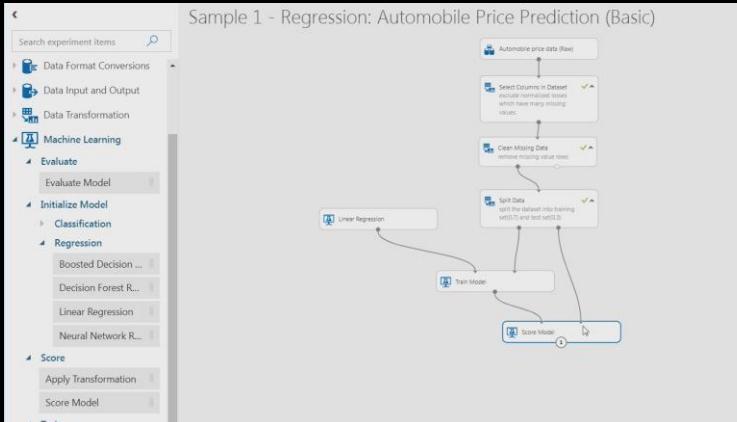
Simplify machine learning for any skill level

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.



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

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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

Automated
machine learning UI

Visual interface

Machine learning notebooks

Simplify machine learning for any skill level

Create a new automated machine learning experiment

Back

Experiment name * my_automated_ml_exp

Select a compute * aml-compute (profiling enabled)

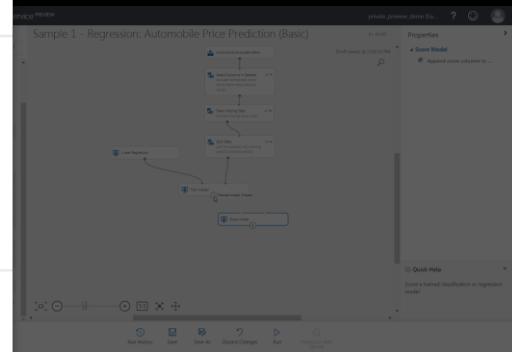
Create a new compute Refresh compute

Cancel Next

Select compute

This screenshot shows the 'Create a new automated machine learning experiment' wizard. It includes fields for 'Experiment name' (set to 'my_automated_ml_exp') and 'Select a compute' (set to 'aml-compute (profiling enabled)'). Below these are buttons for 'Create a new compute' and 'Refresh compute'. At the bottom are 'Cancel' and 'Next' buttons.

Automated
machine learning UI



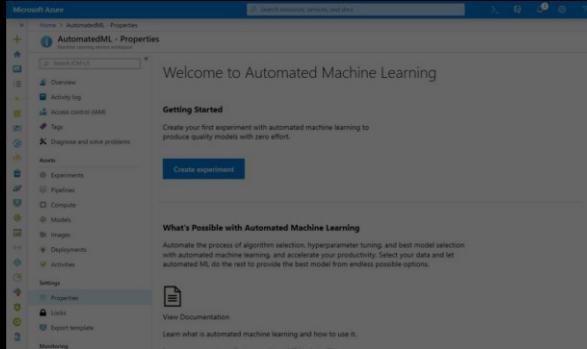
Visual interface

This screenshot shows a Jupyter notebook titled 'distributed-pytorch-with-horovod'. The notebook contains code for distributed PyTorch training using Horovod. The code includes importing the Azure ML core library and printing the version number. The notebook also includes sections for 'Distributed PyTorch with Horovod' and 'Prerequisites'.

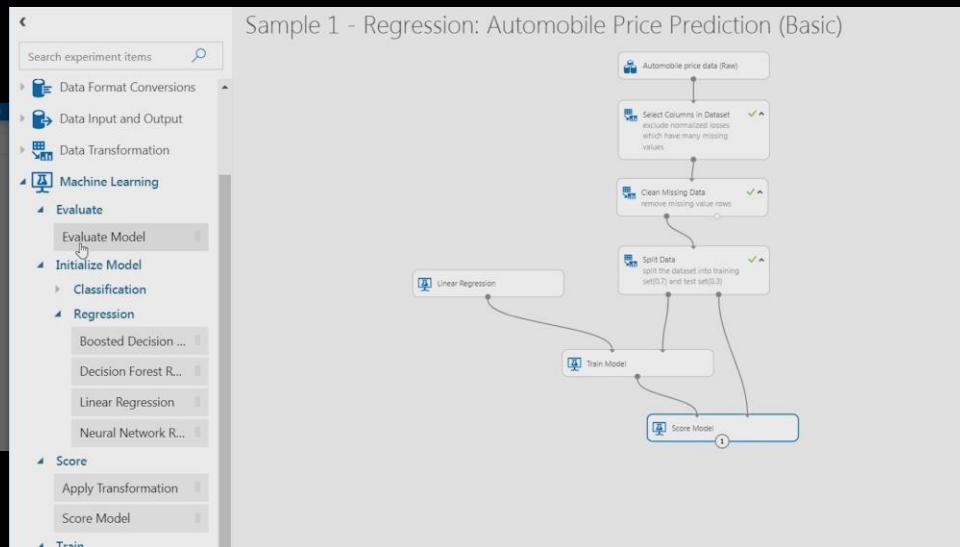
```
# Check core SDK version number
import azureml.core
print("SDK version:", azureml.core.VERSION)
```

Machine learning notebooks

Simplify machine learning for any skill level



Automated
machine learning UI



Visual interface

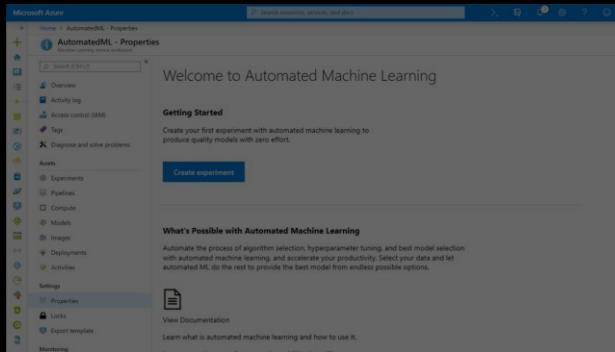
A screenshot of a Jupyter notebook titled 'distributed-pytorch-with-horovod'. The notebook interface includes a top bar with File, Edit, View, Insert, Cell, Kernel, Widgets, Help, and a status bar indicating the last checkpoint was 5 minutes ago. The main content area shows code snippets and text. The code cell contains:

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

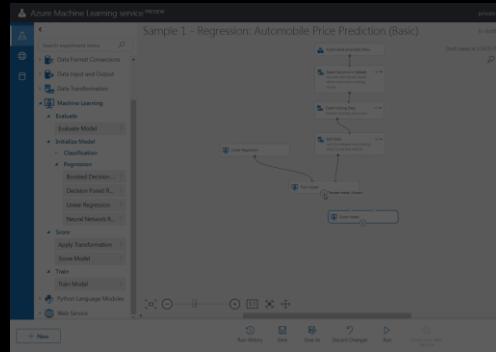
The text below the code reads: 'Copyright © Microsoft Corporation. All rights reserved. Licensed under the MIT License.' and 'Distributed PyTorch with Horovod'. It also includes a note: 'In this tutorial, you will train a PyTorch model on the MNIST dataset using distributed training via Horovod across a GPU cluster.'

Machine learning notebooks

Simplify machine learning for any skill level



Automated
machine learning UI



Visual interface

A screenshot of a Jupyter notebook titled 'distributed-pytorch-with-horovod'. The notebook header indicates it was last checked 5 minutes ago and is autosaved. The content includes a copyright notice, a 'Distributed PyTorch with Horovod' section describing the task, a 'Prerequisites' section with two bullet points, and a code cell for checking the core SDK version:

```
In [ ]: # Check core SDK version number
import azureml.core

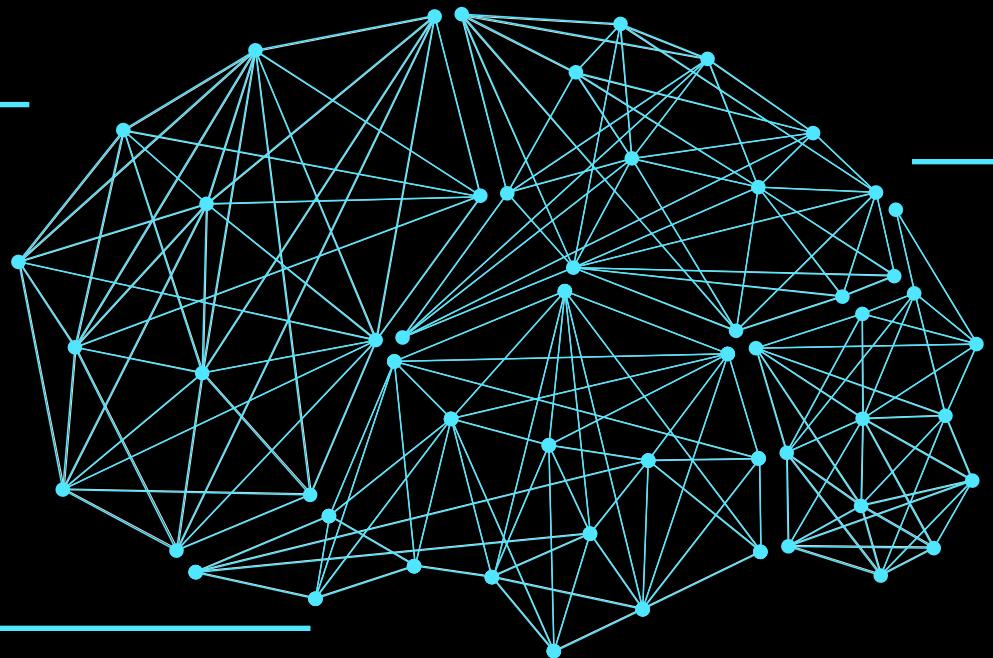
print("SDK version:", azureml.core.VERSION)
```

Diagnostics

Machine learning notebooks

Azure Cognitive Services

Decision

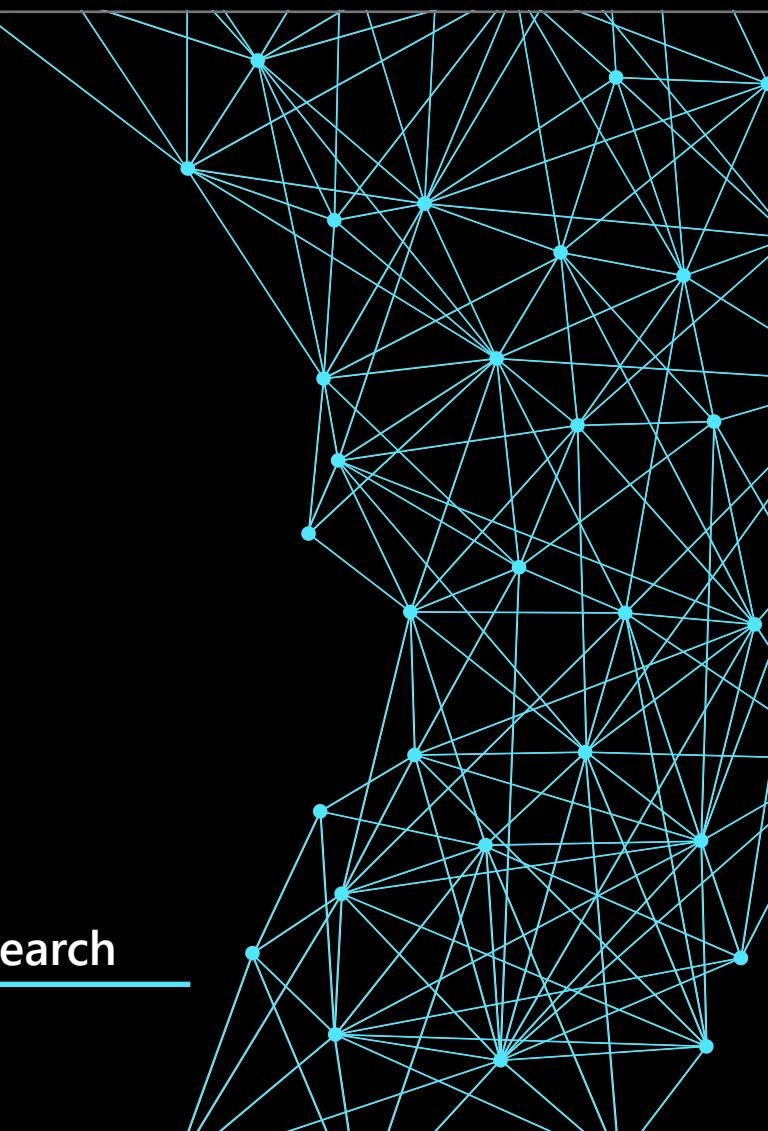


Speech

Language

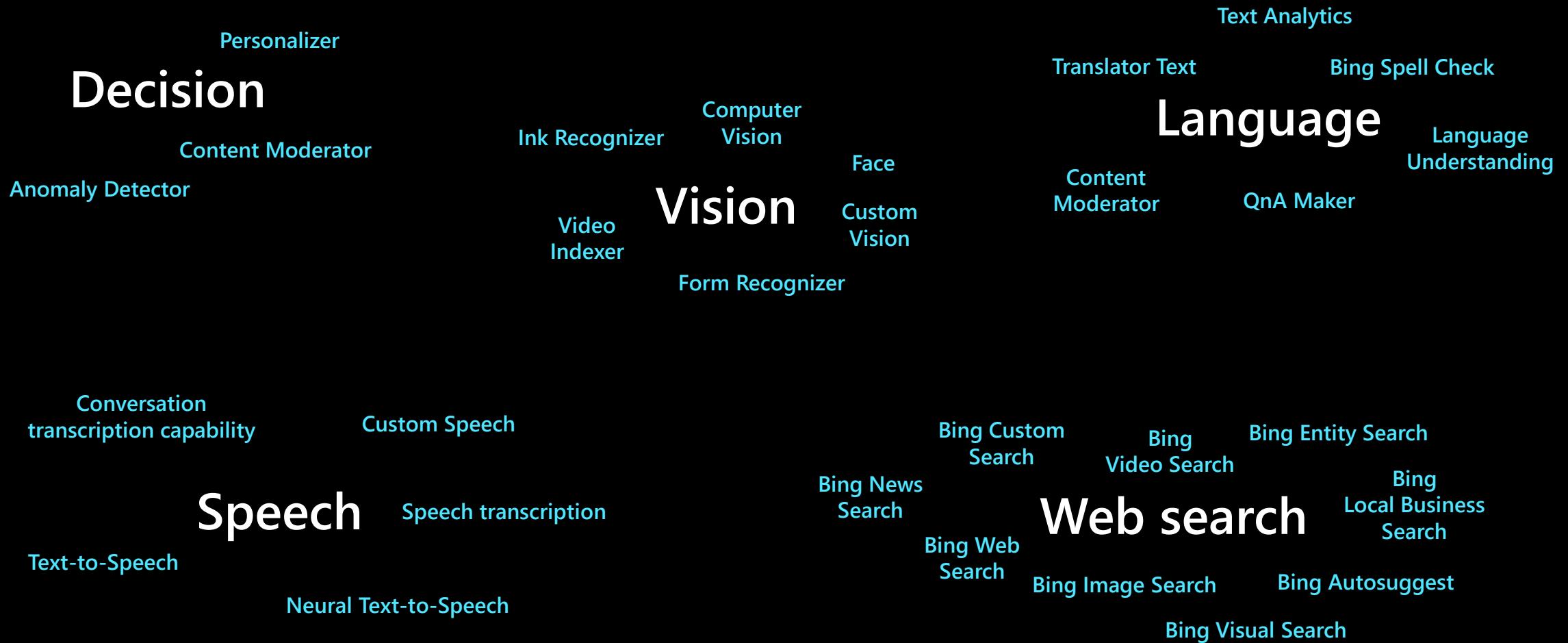
Vision

Web search

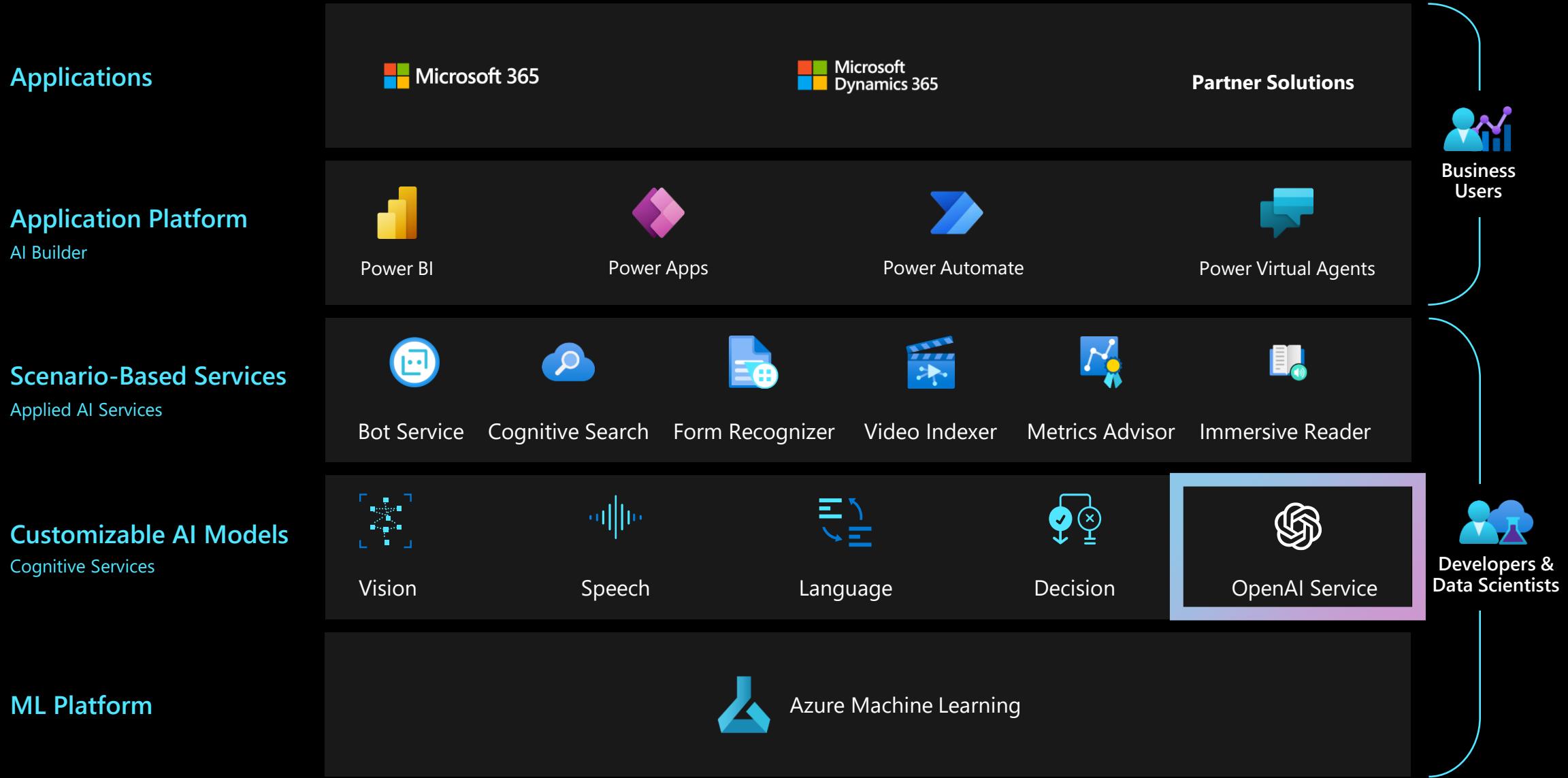


Azure Cognitive Services

The most comprehensive pre-trained AI



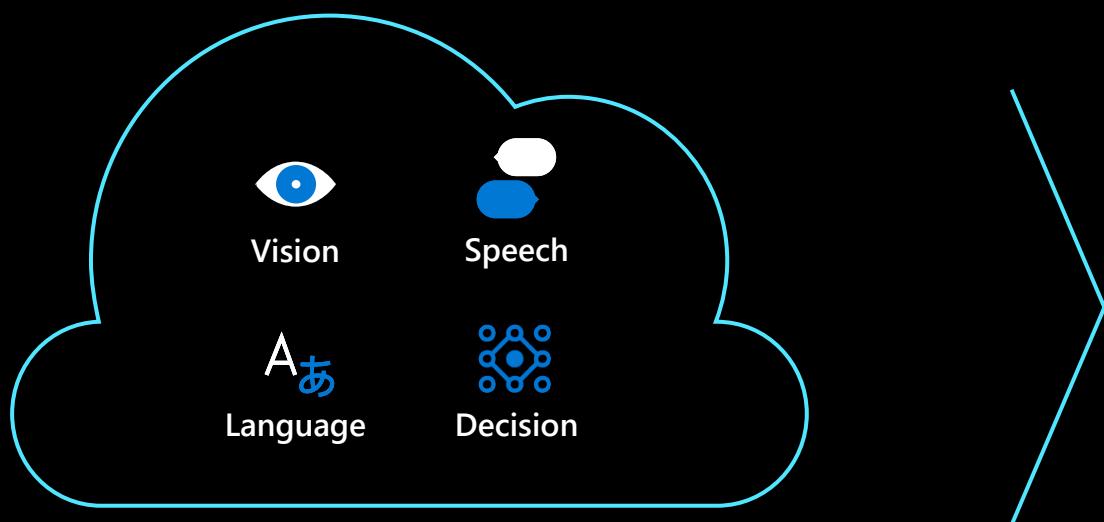
Azure AI



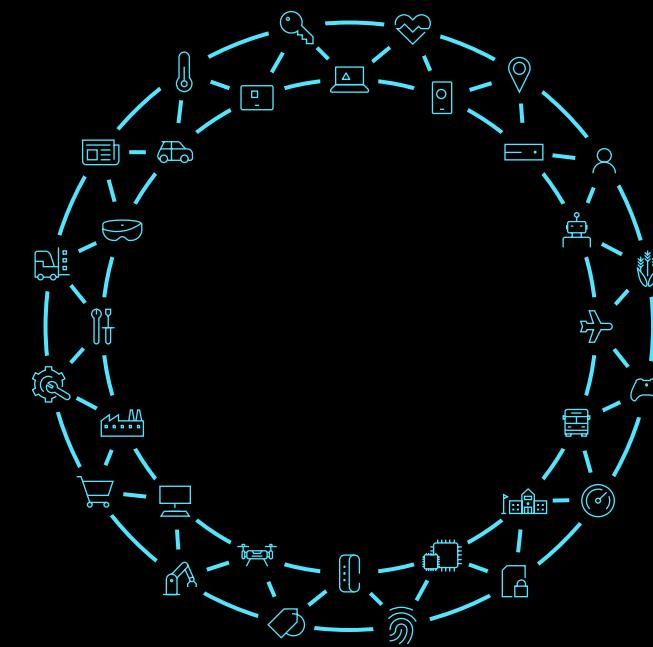
Azure Cognitive Services

Deploy anywhere using containers

Azure Cognitive Services



Wherever your data resides



Computer Vision

Visual Intelligence Made Easy

Easily customize your own state-of-the-art computer vision models that fit perfectly with your unique use case. Just bring a few examples of labeled images and let Custom Vision do the hard work.



Main Types of Computer Vision Algorithms

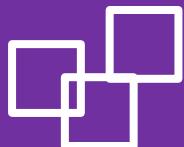
IMAGE CLASSIFICATION

What are my images about?



OBJECT DETECTION

Locate rectangular areas containing known objects in an image



SEMANTIC SEGMENTATION

Locate known objects in an image, at pixel level

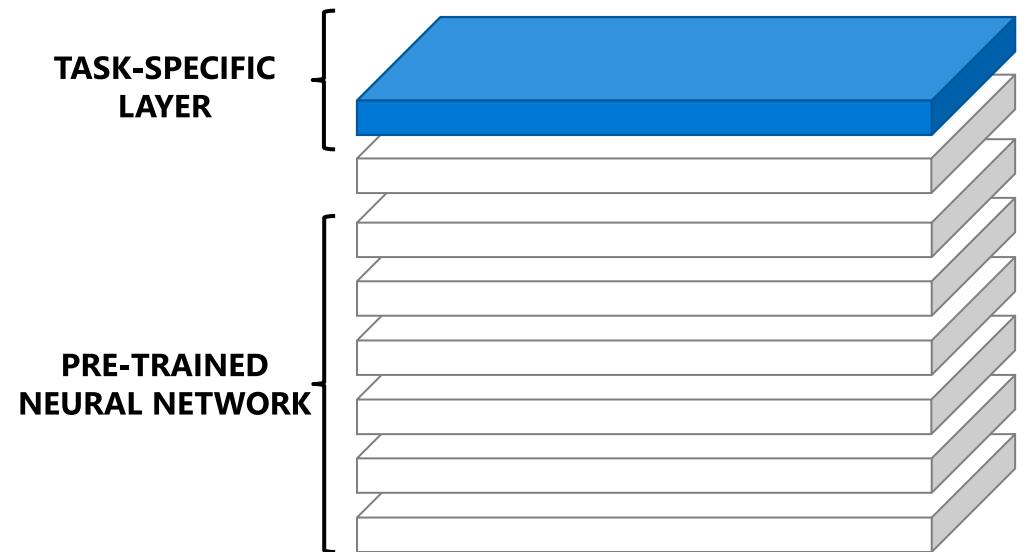


Standing on the Shoulder of Giants – Transfer Learning

By **leveraging existing pre-trained models**

it becomes possible to train highly performant models using a relatively small task-specific data set.

Microsoft Cognitive Services for Computer Vision are ready-to-use and designed around that approach. Custom models trained on ImageNet (AlexNet, Resnet...) are also good examples of foundations for transfer learning.



DEMO

Object Detection – Custom Vision API

- GENERAL AVAILABILITY

Cognitive Services—Speech

- Speech to text
- Text to speech
- Speech translation
- Ability to customize all three capabilities



A あ



DEMO

Text To Speech– Speech API
Automatic Speech Recognition – Speech API





Future of Order Taking

drivethru.wav

Start Recognition

Neural TTS Samples

A palpable chill passes through the room at this maladroit refusal .



Synthesized



Recorded

You can't know how long Tara would have been mad , because that was taken away from her.



Synthesized



Recorded

In Georgia , governor Zell Miller has declared a state of emergency in four counties.



Recorded



Synthesized

Nostalgia could still be evoked after only twenty years , and many remembered when.



Recorded



Synthesized

The forecast for next week shows sunshine with highs in the mid forties.



Synthesized



Recorded

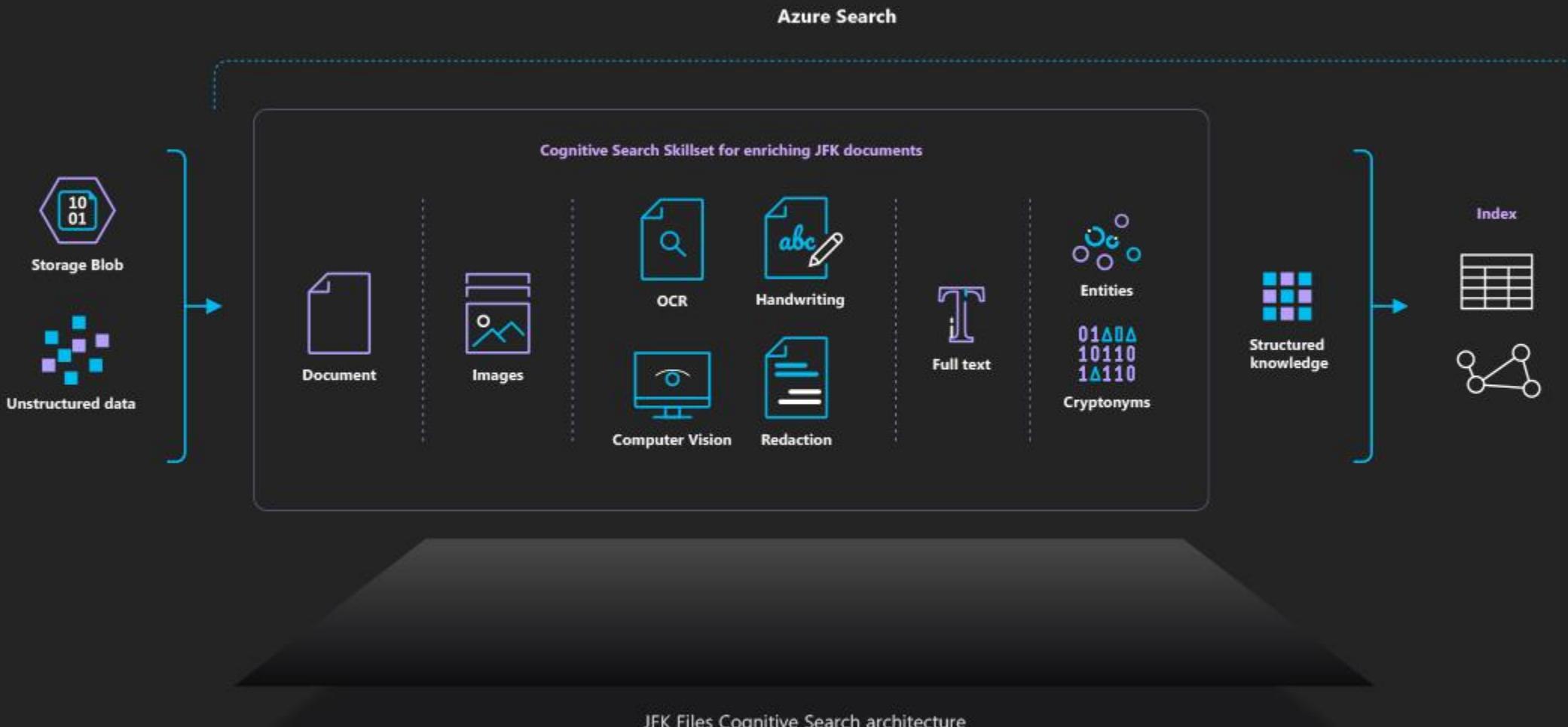
DEMO

Automated Speech Recognition & Text To Speach

JFK Files

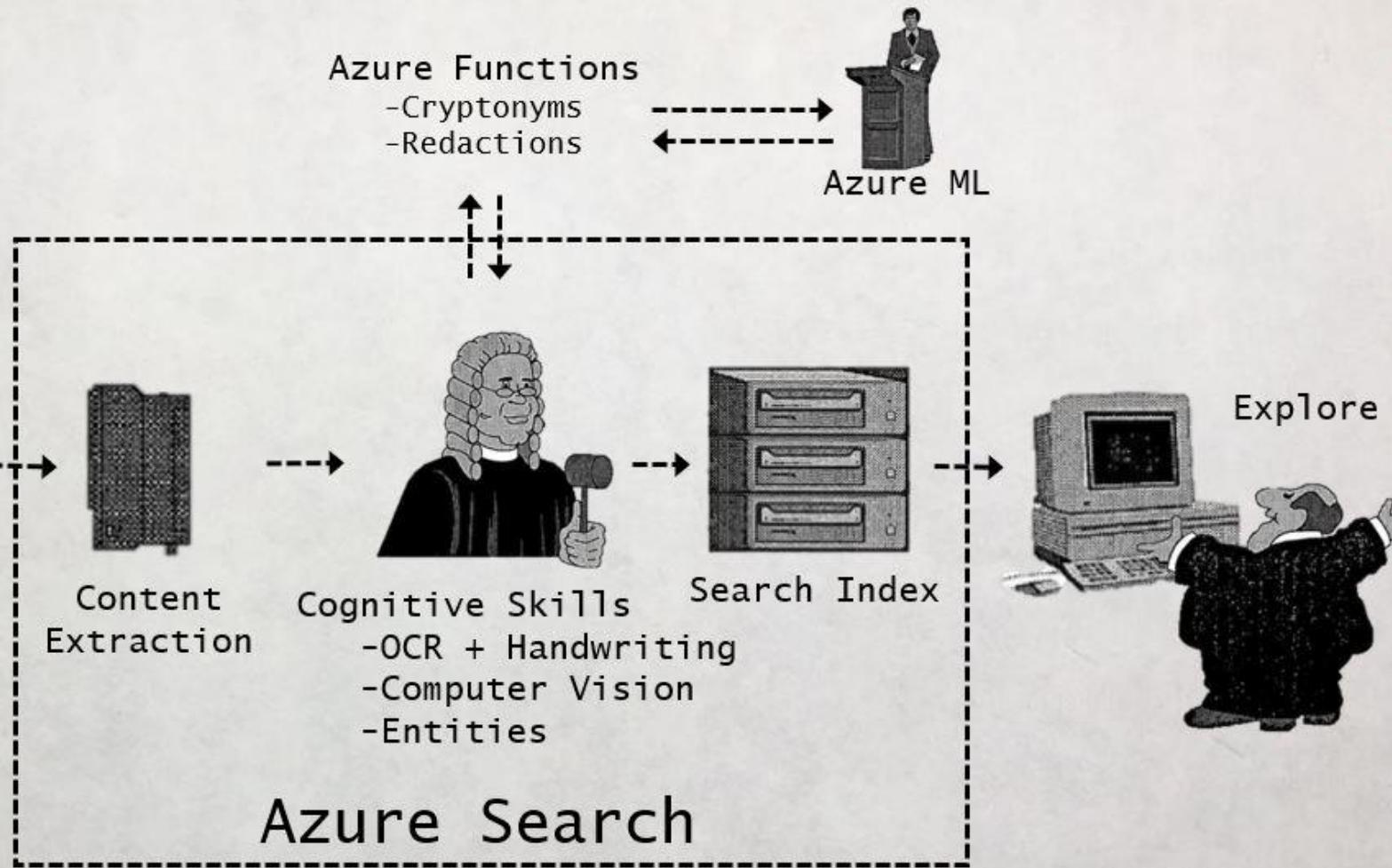
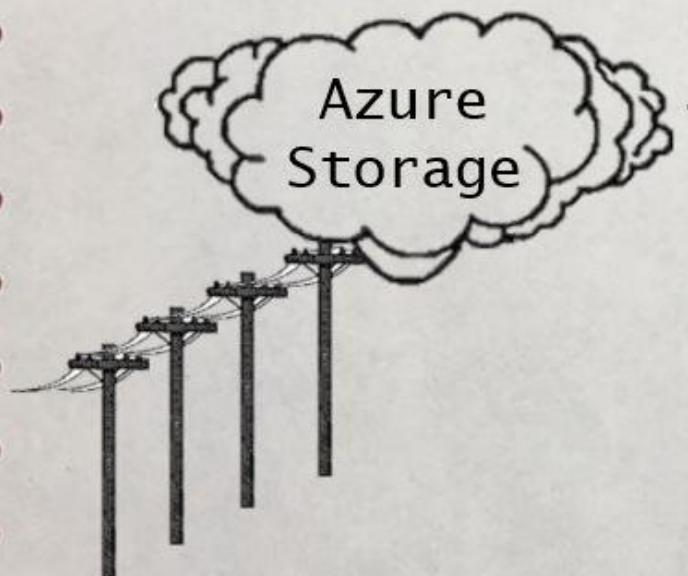


<https://www.microsoft.com/en-us/ai/ai-lab-jfk-files>

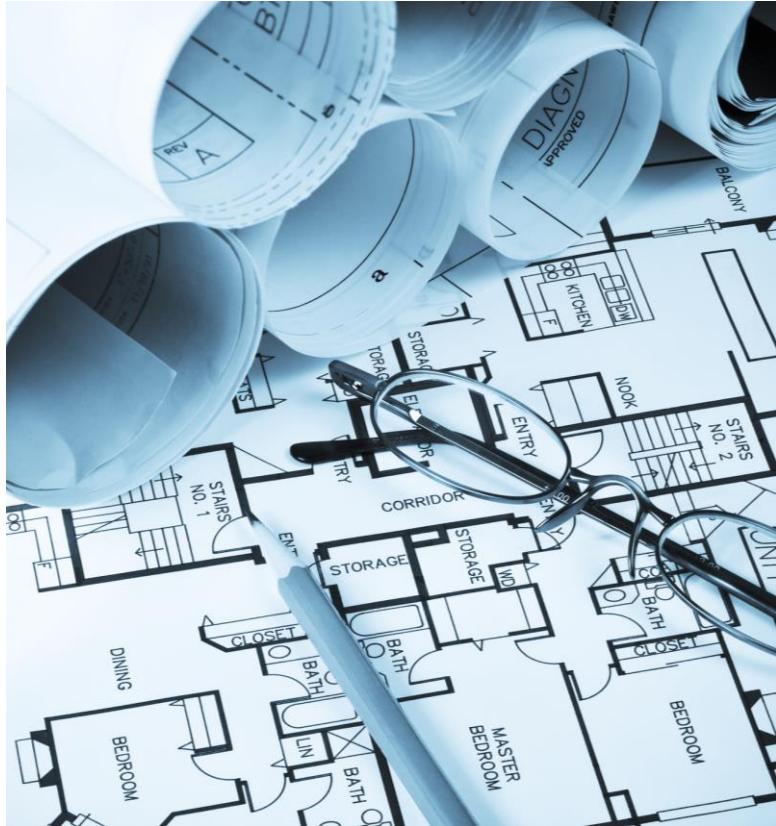


https://github.com/Microsoft/AzureSearch_JFK_Files

- JFK FILES
 - COGNITIVE SEARCH
 - ARCHITECTURE
- DECLASSIFIED**



Analyzing
legal contracts



Understanding
engineering plans



Extracting
form information

<https://jfk-demo.azurewebsites.net/#/>

A professional office environment with large windows overlooking a city skyline. Four people are gathered around a white conference table. A woman in a black blazer and yellow patterned skirt stands behind a man in a dark suit who is seated and looking down at a document. Another man in a dark suit is seated across from him, also looking down. A fourth person's back is to the camera on the right. On the table are a smartphone, a water bottle, and some papers.

Making AI real for your Projects



You have more power at your
fingertips than ever before.



The collage consists of 12 square images arranged in a grid, each depicting a different application of cognitive services:

- Top-left: Two medical professionals in lab coats examining a chalkboard with anatomical drawings.
- Top-center: An astronaut in a spacesuit looking out from a spacecraft.
- Top-right: A medical professional interacting with a patient in a hospital setting, with a screen showing a video call or digital interface.
- Middle-left: A woman working in a grocery store, with a screen displaying various product categories.
- Middle-center: A man wearing a HoloLens headset, overlaid with a 3D anatomical model of a human body.
- Middle-right: A large rocket launching at night, with a person watching from a distance.
- Bottom-left: A woman in a lab coat working in a laboratory.
- Bottom-center: A view from a rover on Mars, showing the surface and a small flag.
- Bottom-right: A man pointing at a large screen displaying a video game or simulation.
- Bottom-left: A woman in a lab coat using a microscope.
- Bottom-center: A satellite in space, with Earth visible in the background.
- Bottom-right: Two people in a retail store, one interacting with a digital display showing a woman's image.

Use Cognitive Services to
change the world that you see

