

Playing the game with Azure Cognitive Services

Pieter Vandenheede, Zure

Global Integration Bootcamp - Rotterdam

A professional portrait of Pieter Vandenheede, a man with short brown hair and a slight beard, wearing a black t-shirt with a large white 'E' logo. He is smiling and looking directly at the camera against a dark background.

Pieter Vandenheede

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Co-Founder
MCT



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ABOUT ZURE



- **100%** Azure since 2011
- **4** Azure MVP's
- **52 / 55** experts
- **92** Employee NPS
- **14,2** yrs experience avg



Gold Application Development
Gold Cloud Platform
Gold Data Analytics
Gold Data Platform
Gold DevOps



Microsoft®
Most Valuable
Professional

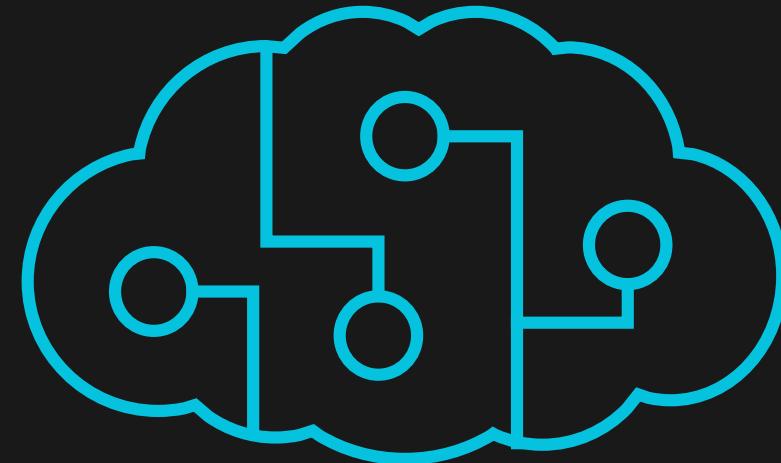
Microsoft
CERTIFIED
Trainer

Partner Seller

Microsoft
Partner

2019 Partner of the Year Finalist
Application Innovation Award

Azure Cognitive Services



**As an (integration) developer,
why should I care about AI and ML?**

Some problems are difficult to solve using traditional algorithms and procedural programming.



Identify objects and people in photos and videos



Recommend products to your users based on historical data



Detect failures in an industrial process before they happen



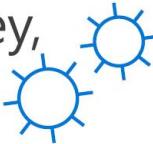
Navigate autonomously around obstacles and obey traffic laws

Why Microsoft Cognitive Services?

Easy

Roll your own with REST APIs

Simple to add: just a few lines of code required

Get a key,
Build 

Flexible

Integrate into the language and platform of your choice
Breadth of offerings helps you find the right for your app
Bring your own data for your custom experience

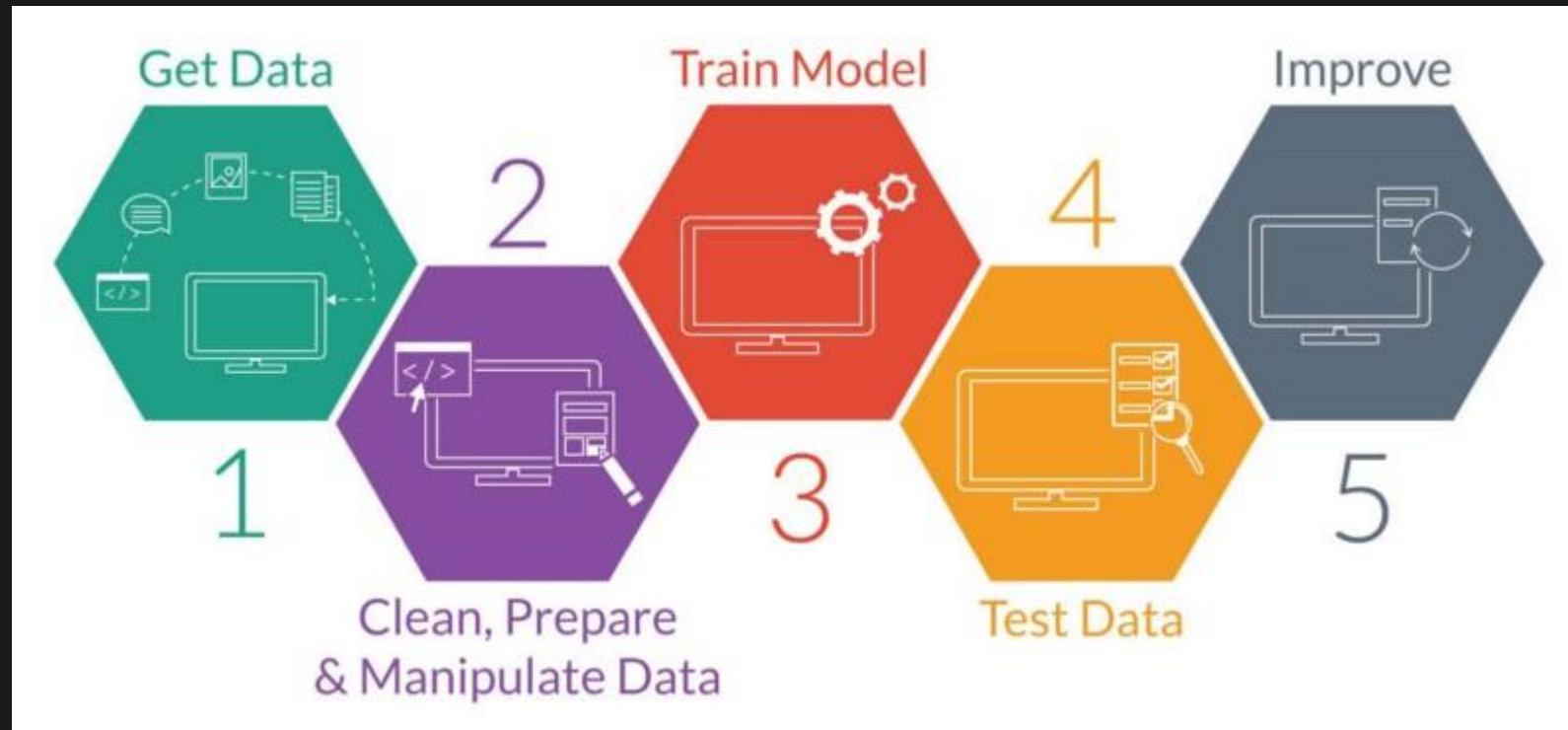


Tested

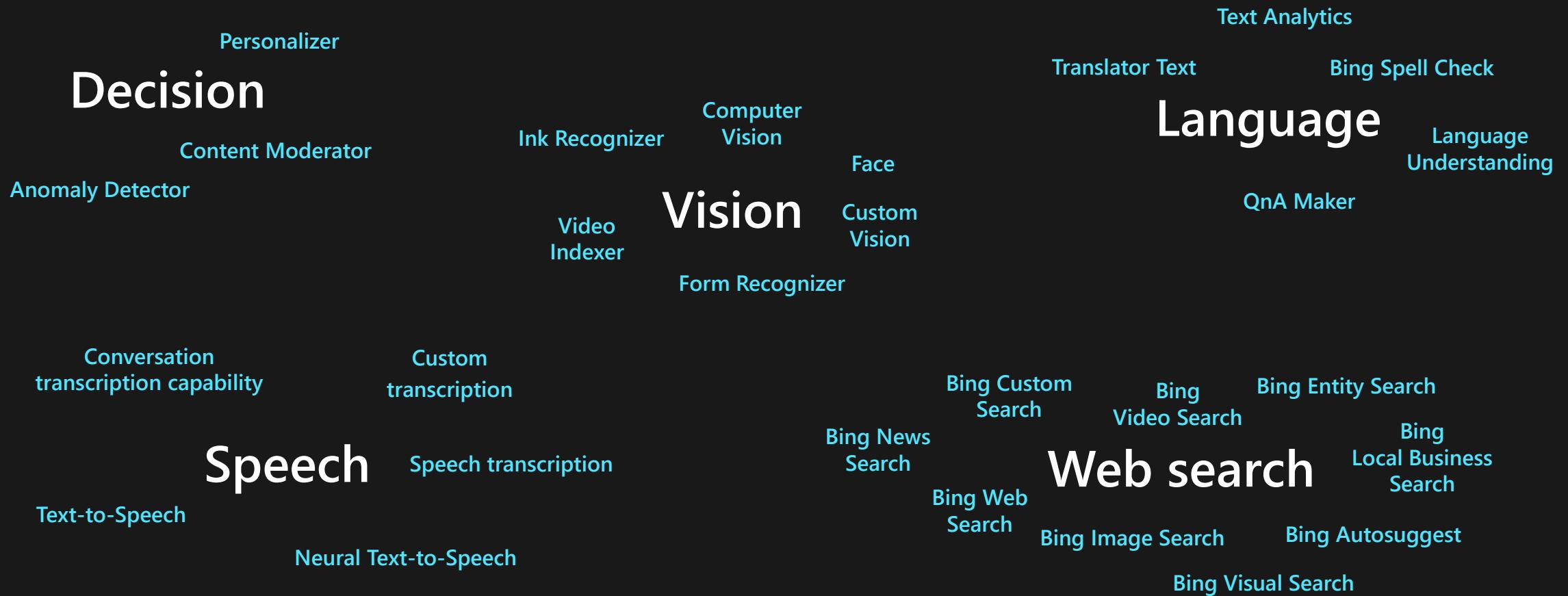
Built by experts in their field from Microsoft Research, Bing, and Azure Machine Learning
Quality documentation, sample code, and community support



Machine Learning Process



Azure Cognitive Services





Vision

Vision



Computer Vision



Custom Vision



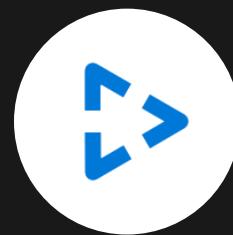
Face



Form Recognizer *

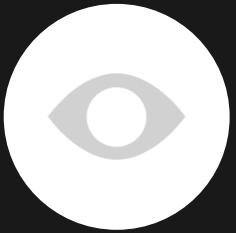


Ink Recognizer *



Video Indexer

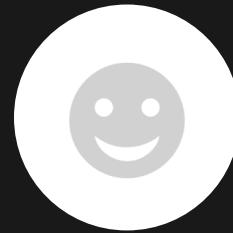
Vision



Computer Vision



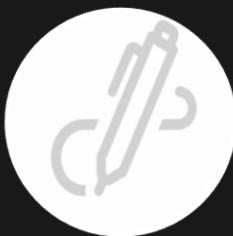
Custom Vision



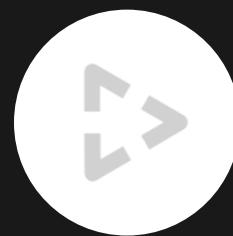
Face



Form Recognizer *

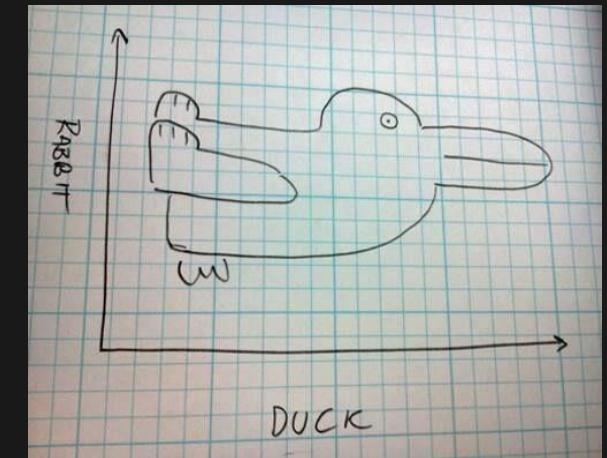
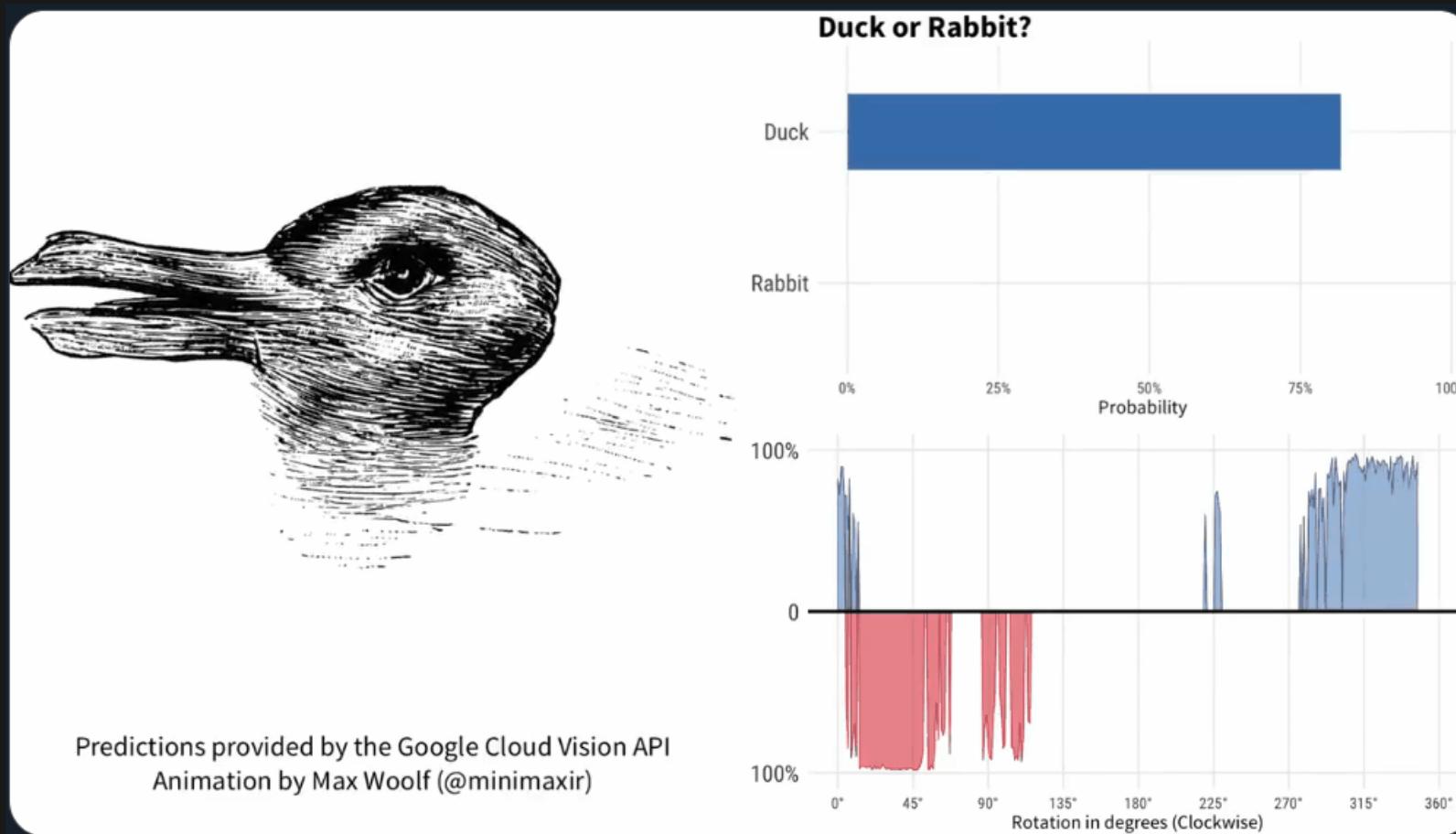
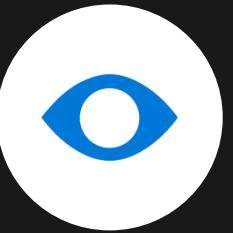


Ink Recognizer *



Video Indexer

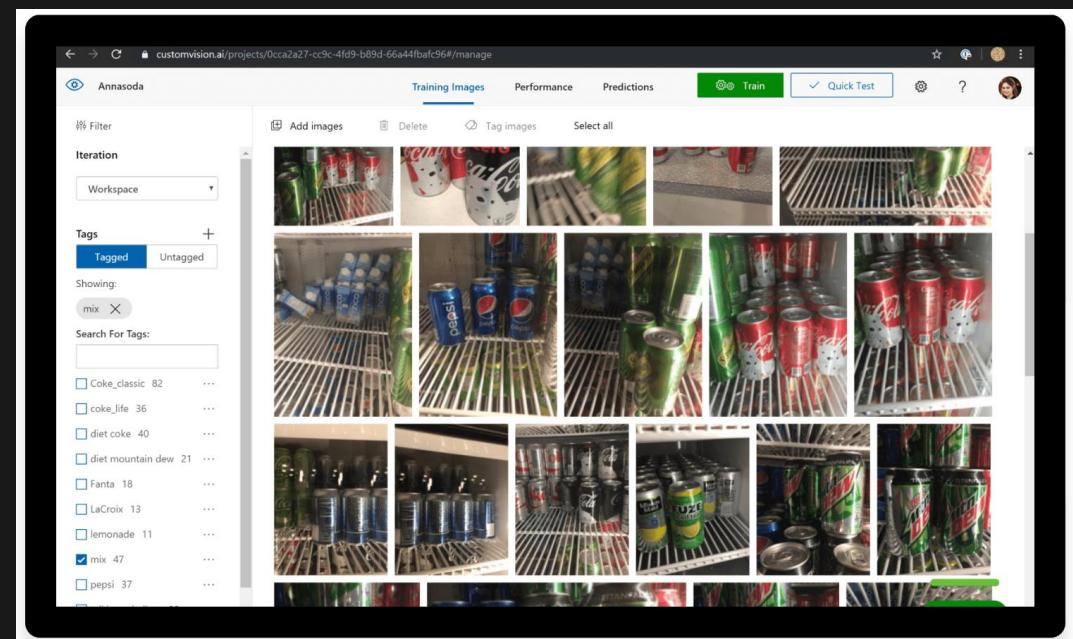
Fun with Vision services



Custom Vision



- Learn to customize your scenario
 - Train your model by uploading example images and labelling them
 - Recognize objects
 - Get the info you want from your images

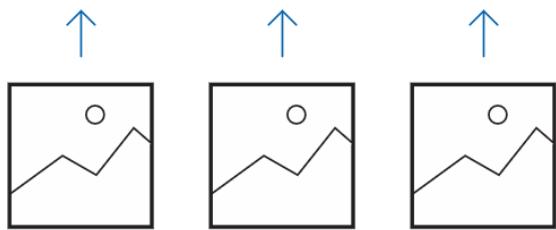


Custom Vision



- Allows you to upload your own images, label them and train a service to recognize objects specific to your/any domain.
- Use as little as 50 images for a prototype
- Keep improving your model with new iterations
- Publish model as REST API

Custom Vision



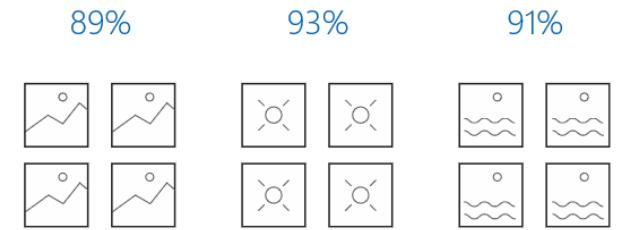
Upload Images

Bring your own labeled images, or use Custom Vision to quickly add tags to any unlabeled images.



Train

Use your labeled images to teach Custom Vision the concepts you care about.



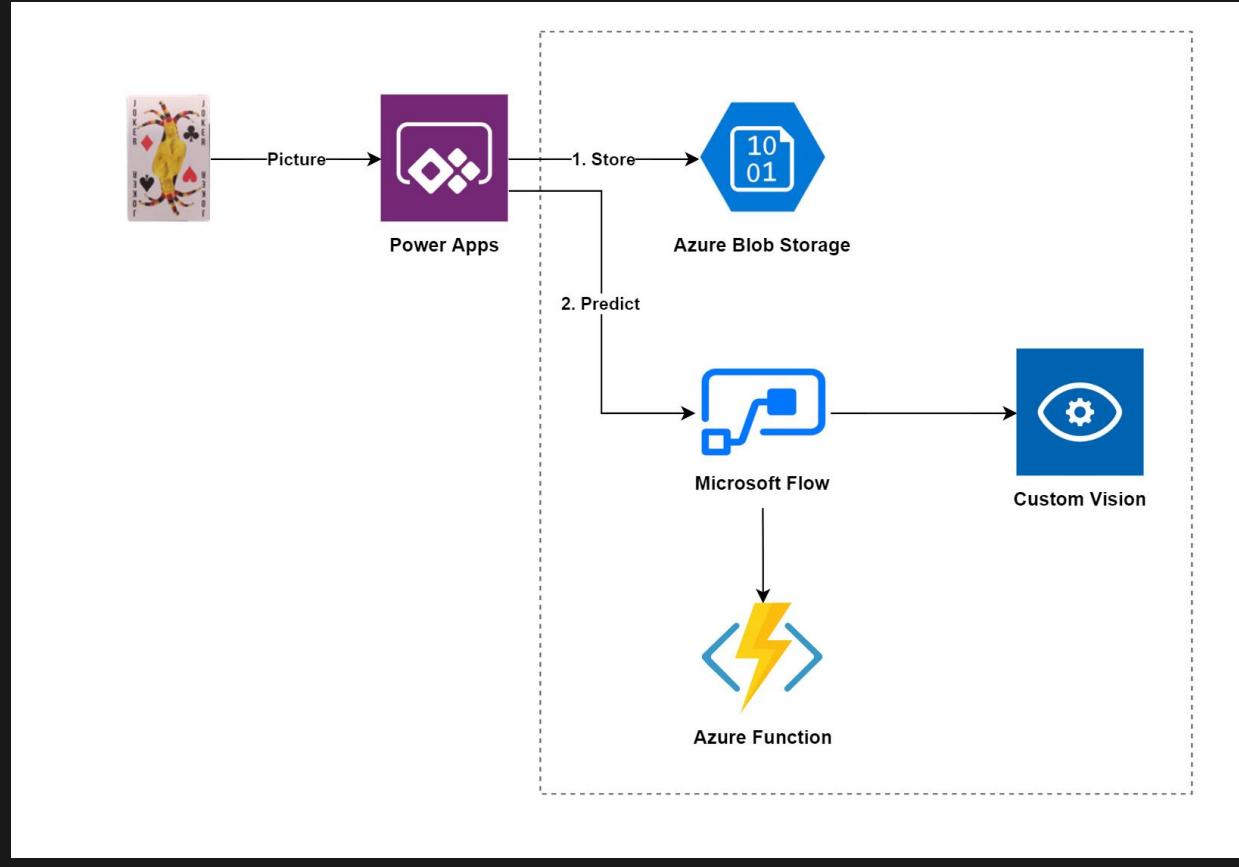
Evaluate

Use simple REST API calls to quickly tag images with your new custom computer vision model.

Custom Vision – Demo



Custom Vision – Demo Setup



Form Recognizer *



- Extract text and structure from documents (e.g. PDF)
 - Key/Value Pairs
 - Tables
 - Forms
 - Receipts

The screenshot shows the Microsoft Form Recognizer interface. On the left is a grayscale image of a receipt from Contoso. The receipt details include the merchant name 'Contoso', address '123 Main Street Redmond, WA 98052', phone number '987-654-3210', date '6/10/2019 13:59', sales associate 'Paul', and a purchase breakdown for a Surface Pro 6 and a Surface Pen. On the right, under the 'JSON' tab, is a table of extracted fields:

Extracted Fields	
Merchant:	Contoso
Address:	123 Main Street Redmond, WA 98052
Phone number:	+9876543210
Date:	2019-06-10
Time:	13:59:00
Subtotal:	1098.99
Tax:	104.4
Total:	1203.39

Form Recognizer - Demo



The screenshot shows a dark-themed application window for 'Q-Park'. On the left, a parking receipt is displayed. The receipt details a transaction at Q-Park Zuiderpoort Gent, dated 07/01/2020, starting at 17:40 and ending at 17:40. The total amount is 12.00 EUR. It includes merchant information like ref. 0631734054 and terminal CT428772. On the right, the 'PREDICT' interface shows the results of the form recognition. The results table lists various fields and their predicted values with confidence percentages:

Result	Value	Confidence (%)
P.1 Parking	Q-Park Zuiderpoort Gent	100.0%
P.1 VAT Number	BE 0471121080	98.0%
P.1 Start	07/01/2020	98.9%
P.1 End	17:40	99.0%
P.1 Duration	0 Dagen, 07:13	99.9%
P.1 Merchant Ref	0631734054	91.0%
P.1 Terminal	CT428772	97.0%
P.1 Merchant	2100868141	96.0%
P.1 Transaction Nr	00103066	96.0%
P.1 Payment Timestamp	07/01/2020	95.0%
P.1 Auth Code	174936	96.0%
P.1 Amount	12.00	99.0%



Cognitive Containers

VMs vs Containers

VIRTUAL MACHINES



CONTAINERS



WHATS
the
DIFF?

Source: <https://www.backblaze.com/blog/vm-vs-containers/>

VMs vs Container

What's the Diff: VMs vs Containers

VMs	Containers
Heavyweight	Lightweight
Limited performance	Native performance
Each VM runs in its own OS	All containers share the host OS
Hardware-level virtualization	OS virtualization
Startup time in minutes	Startup time in milliseconds
Allocates required memory	Requires less memory space
Fully isolated and hence more secure	Process-level isolation, possibly less secure

Source: <https://www.backblaze.com/blog/vm-vs-containers/>

Why Cognitive Containers?

- Control over data
 - Data is not sent over the internet
- Control over model updates
 - Flexibility in versioning and model updates
- Portable architecture
 - Azure, on-premises or edge
- High Throughput, Low Latency
 - Run physically close to your application

* Internet connection is still required for billing purposes

Availability

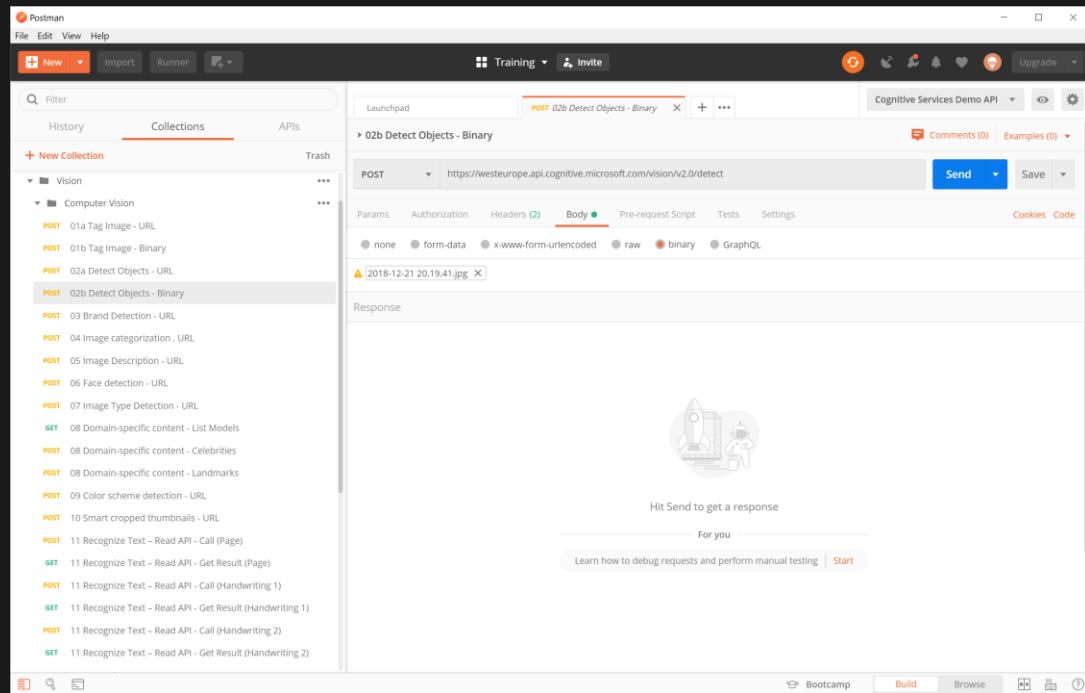
- Anomaly Detector
- Computer Vision
- Face
- Form Recognizer *
- Language Understanding (LUIS)
- Speech Service API
- Text Analytics

A silhouette of a person sitting cross-legged, reading a book. The background is a warm, orange and yellow sunset sky.

Resources

Vision Postman collection

- <https://github.com/pvandenheede/cognitive-postman-collection>



Microsoft Learn

- <http://zure.ly/ai-intro/learnpath-vision>

The screenshot shows a Microsoft Learn course card for "Process and classify images with the Azure Cognitive Vision Services". The card features a blue hexagonal icon with a brain and circuit board symbols. The title is "Process and classify images with the Azure Cognitive Vision Services" in bold black font. Below the title, it says "2 hr 45 min • Learning Path • 0 of 4 modules completed". A "3500 XP" badge is in the top right corner. Below the title, there are five tags: Beginner, AI Engineer, Azure, Azure Portal, and Cognitive Services. The description below the tags reads: "Microsoft Cognitive Services offers pre-built functionality to enable computer vision functionality in your applications. Learn how to use the Cognitive Vision Services to detect faces, tag and classify images, and identify objects." At the bottom, under "Prerequisites", it lists "Azure Fundamentals".

Microsoft Learn

- <http://zure.ly/ai-intro/learnpath-text>



Evaluate text with Azure Cognitive Language Services

2 hr 13 min • Learning Path • 0 of 3 modules completed

Beginner AI Engineer Azure Azure Portal Cognitive Services

Learn how to use Cognitive Language Services to analyze text, determine intent, detect adult themes, and process natural language input.

Prerequisites
Azure Fundamentals

2400 XP

Microsoft Learn

- <http://zure.ly/ai-intro/learnpath-speech>

The screenshot shows a learning path card for 'Process and translate speech with Azure Cognitive Speech Services'. The card has a blue hexagonal icon on the left containing a lowercase 'a' and arrows indicating a cycle. To the right of the icon, the title is displayed in bold black font: 'Process and translate speech with Azure Cognitive Speech Services'. Below the title, the duration '1 hr 34 min' and 'Learning Path' are shown, along with the progress '0 of 2 modules completed'. A '2100 XP' badge is in the top right corner. Below the title, there are five tags: 'Beginner', 'AI Engineer', 'Azure', 'Azure Portal', and 'Cognitive Services'. The main description text reads: 'Azure Cognitive Services provides functionality to enable speech services in your applications. Learn how to convert speech to text and recognize specific speakers in your applications by integrating the Cognitive Speech Services.' At the bottom, there is a 'Prerequisites' section with the link 'Azure Fundamentals'.

2100 XP

Process and translate speech with Azure Cognitive Speech Services

1 hr 34 min • Learning Path • 0 of 2 modules completed

Beginner AI Engineer Azure Azure Portal Cognitive Services

Azure Cognitive Services provides functionality to enable speech services in your applications. Learn how to convert speech to text and recognize specific speakers in your applications by integrating the Cognitive Speech Services.

Prerequisites

Azure Fundamentals

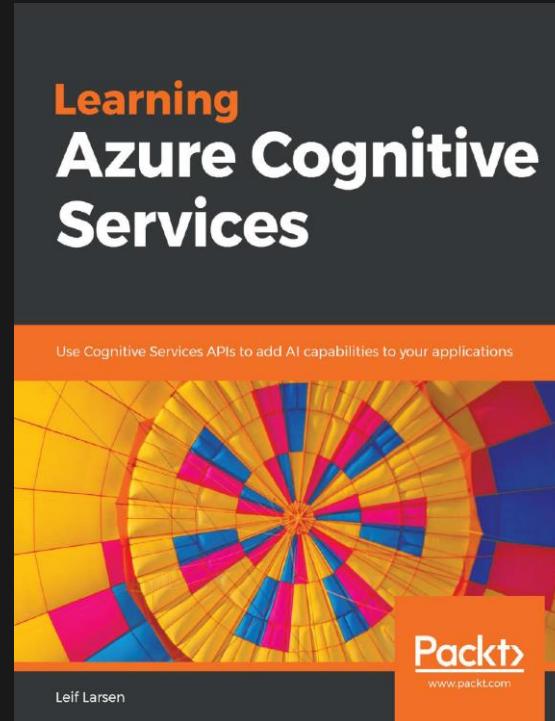
Microsoft Learn

- <http://zure.ly/ai-intro/learn-search>

The screenshot shows a Microsoft Learn module titled "Introduction to Azure Cognitive Search". The module icon features a magnifying glass over a cloud with an Azure logo. The title is "Introduction to Azure Cognitive Search" in bold black font. Below it, the duration is listed as "53 min • Module • 9 Units". A rating of "4.6 (105)" is shown with a "Rate it" button. Below the rating are three categories: "Beginner", "Developer", and "Azure". A "1000 XP" badge is in the top right corner. The module description is "Use Azure Cognitive Search to make your data searchable." The goal statement is "In this module, you will:". A bulleted list follows: "• Explore Azure Cognitive Search", "• Create an Azure Cognitive Search index", "• Import data to the index", and "• Query the Azure Cognitive Search index".

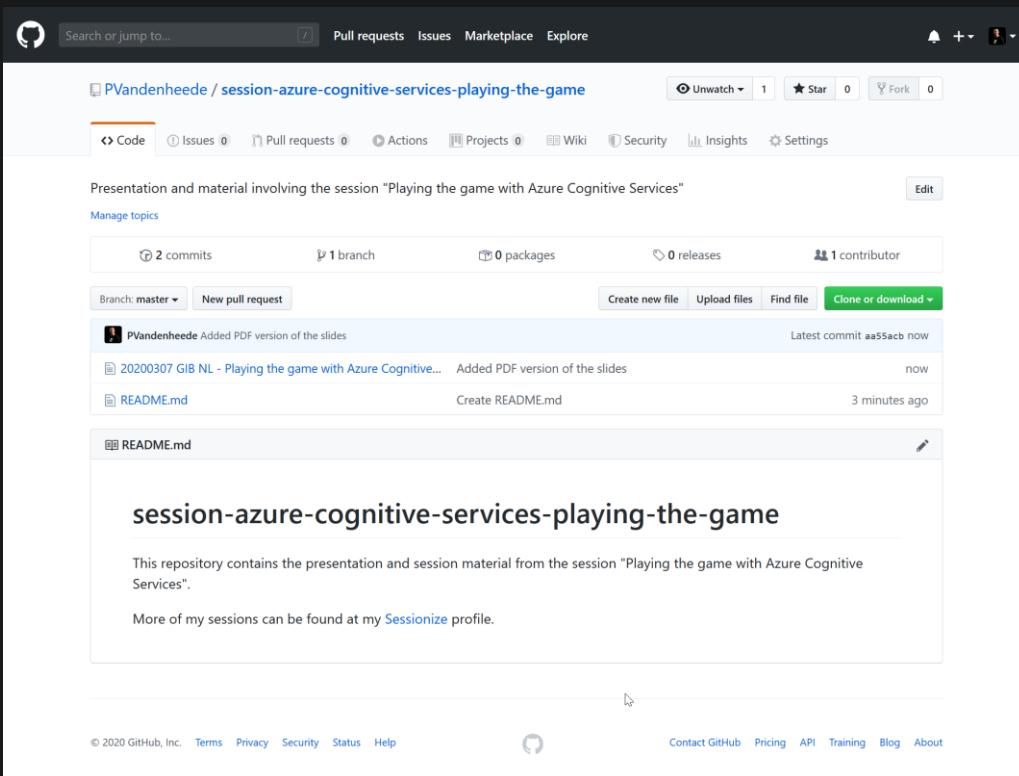
Microsoft Azure Cognitive Services Book

- <http://zure.ly/ai-intro/cognitive-book>
- 313p
- **FREE**



Presentation Material

- <http://zure.ly/pieter/azcognitive-playingthegame>





ZURE

@pvandenheede

The logo consists of the word "ZURE" in a bold, white, sans-serif font. A diagonal white line starts from the top left of the letter "Z" and extends towards the top right, passing through the top of the letter "U".

ZURE