

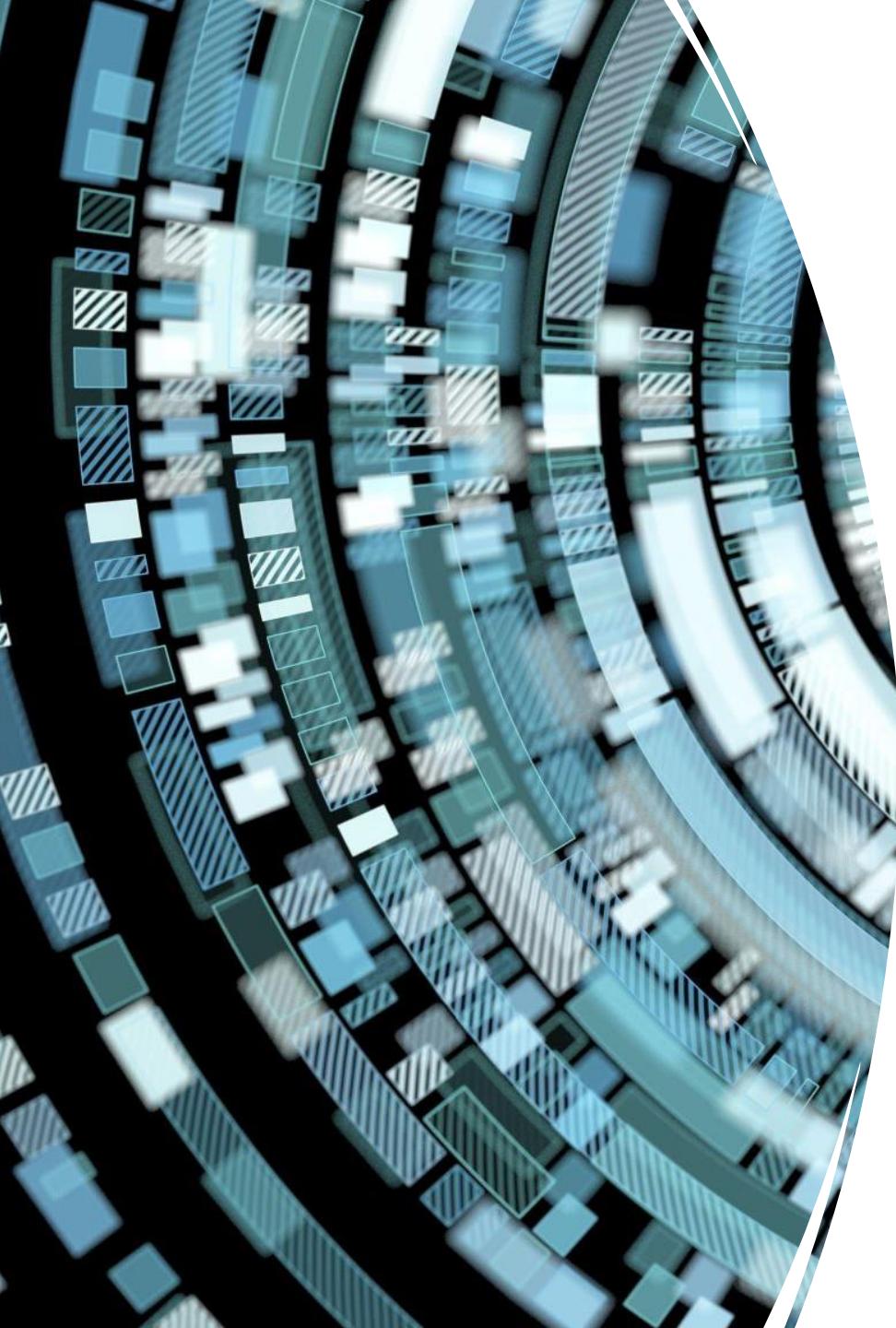


Customer

Azure Cognitive Services
workshop

Date





Microsoft contacts

- **Serge Retkowsky**
serge.retkowsky@microsoft.com



Program overview

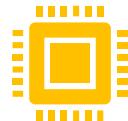
Workshop Prerequisites



Activate and Access an
[Azure Subscription](#)



Create an Azure Machine
Learning Workspace in the
Azure Portal : [LINK HERE](#)



Account for Azure DevOps
: [LINK HERE](#)



Prerequisites by Role



Recommended Azure ML
training on Microsoft
Learn

App Developers : VS Code, Python
ML Engineers : No prerequisites
Citizen Data Scientists : Python,
Jupyter Notebooks
Business Data Scientists : No
prerequisites
Enterprise Architects : Cloud
Policies and Security

ML with Code:
<https://docs.microsoft.com/en-us/learn/patterns/build-ai-solutions-with-azure-ml-service>

ML with No Code / Low Code:
<https://docs.microsoft.com/en-us/learn/patterns/create-no-code-predictive-models-azure-machine-learning>

ML at the Edge for IoT:
<https://docs.microsoft.com/en-us/learn/patterns/ai-edge-engineer>



Workshop 1

Azure ML fundamentals

- Presentation and demo of Azure ML.
- Presentation of Azure documentation resources & certifications path.



Workshop 2

Azure ML fundamentals

- Hands-on labs:
 - Azure ML experimentations
 - AutoML with Azure ML Python SDK
 - Estimators with Azure ML Python SDK
 - Interpretation & Fairness of ML models
 - Hyperparameter tuning with Azure ML
 - Model deployment



Workshop 3

No Code with Azure ML

- Hands-on labs:
 - AutoML graphical user interface
 - Azure ML Designer interface for building no code pipelines
 - Use case: Anomaly detection with Azure ML Designer
 - PowerBI Integration



Workshop 4

Azure Computer Vision

- Introduction to Azure Cognitive Services.
- Deep dive on Azure Computer Vision presentation.
- Hands-on lab:
 - Training of a custom vision model
 - Validation and deployment of a custom vision model



Workshop 5

MLOps

- Introduction to MLOps
- Hands-on lab:
 - Implementing CI/CD pipeline using GitHub Action & Azure DevOps

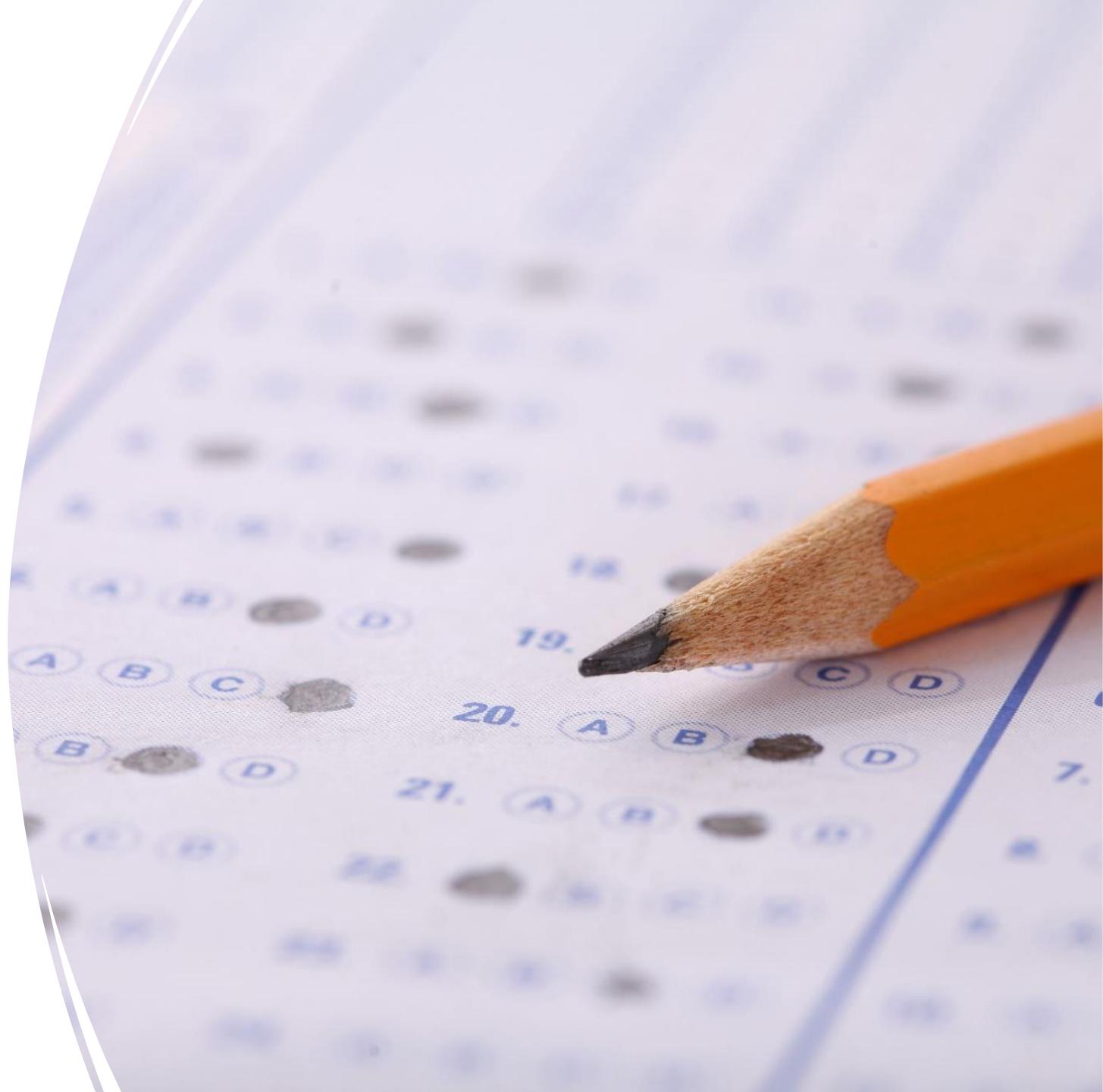


Workshop 6

Azure Databricks

- Azure Databricks presentation
- Hands-on lab:
 - Data preparation
 - ML
 - Model deployment
 - Azure ML integration

Quiz time 1



Agenda



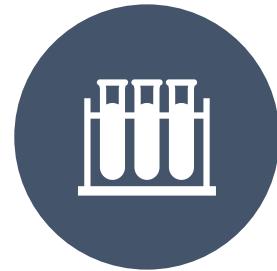
AZURE COGNITIVE
SERVICES
PRESENTATION



AZURE ML UPDATES



AZURE COGNITIVE
RESOURCES

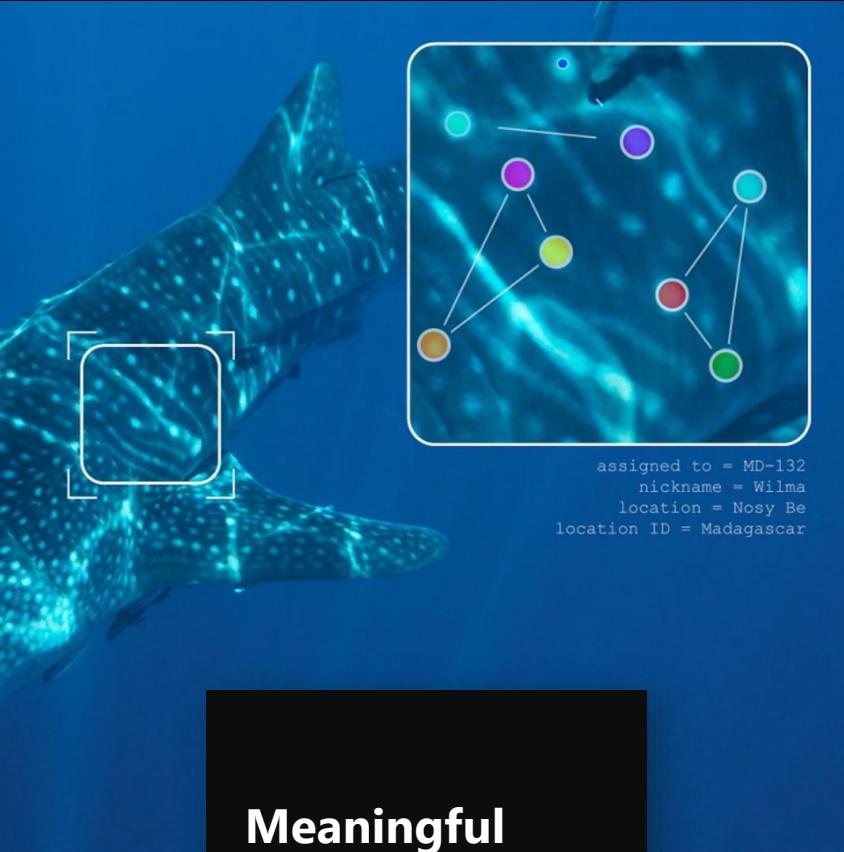


LABS

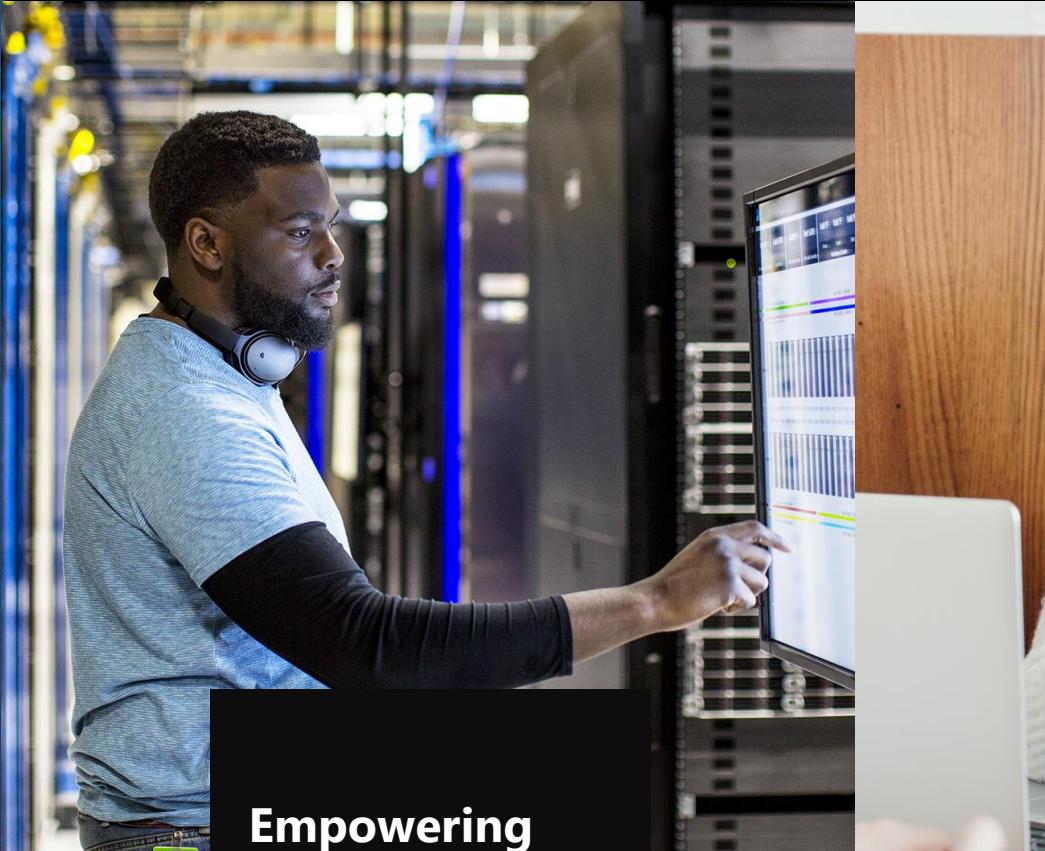
Azure AI Cognitive services



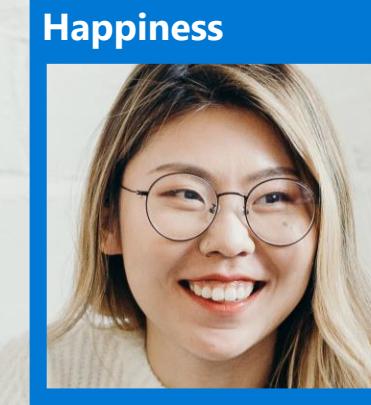
Microsoft's AI Approach



Meaningful
Innovation



Empowering
People



Responsible AI

Democratizing AI for every employee

<https://azurecharts.com/overview>

Azure Services Overview

Overview of Azure services. Linked directly to Azure Service 360° for service summary information.														FOCUS:	ALL SERVICES
AI + Machine Learning	Analytics	Compute	Databases	Development	Identity + Security	IoT + MR	Integration	Management + Governance	Media	Migration	Networking	Storage			
 Batch AI	 Analysis Services	 App Service	 Blockchain Service	 App Configuration	 Azure Active Directory	 Azure Maps	 API Management	 Automation	 Azure CDN	 Azure Migrate	 Application Gateway	 Avere vFXT			
 Bot Service	 Data Catalog	 App Service (Linux)	 Cosmos DB	 Azure DevOps	 Azure AD B2C	 Azure Sphere	 Azure API for FHIR	 Azure Advisor	 Media Services	 Data Box	 Azure Bastion	 Azure NetApp Files			
 Cognitive Search	 Data Explorer	 Azure Batch	 Database for MariaDB	 Azure Spring Cloud	 Azure AD DS	 Digital Twins	 Event Grid	 Azure Arc	 DB Migration Service	 Azure DNS	 Azure Storage				
 Cognitive Services	 Data Factory	 Azure Functions	 Database for MySQL	 DevTest Labs	 Azure Key Vault	 IoT Central	 Logic Apps	 Azure Backup	 Site Recovery	 Azure Firewall	 Data Lake Storage				
 Machine Learning	 Data Lake Analytics	 Azure VMware Solutions	 Database for PostgreSQL	 Lab Services	 Azure Sentinel	 IoT Edge	 Notification Hubs	 Azure Blueprints		 Azure Front Door	 Data Share				
 Microsoft Genomics	 Databricks	 Cloud Services	 Redis Cache	 SignalR Service	 DDoS Protection	 IoT Hub	 Service Bus	 Azure Lighthouse		 ExpressRoute	 Managed Disks				
 Open Datasets	 Event Hubs	 Container Instances	 SQL Database	 Visual Studio App Center	 Dedicated HSM	 Remote Rendering		 Azure Monitor		 Load Balancer	 StorSimple				
	 HDInsight	 Container Registry	 SQL Server Stretch DB		 Information Protection	 Spatial Anchors		 Azure Policy		 Network Watcher					
	 Power BI Embedded	 CycleCloud			 Security Center	 Time Series Insights		 Azure Portal		 Private Link					

AI & ML on Azure

Domain specific pretrained models

To simplify solution development



Vision



Speech



Language



Search

Familiar Data Science tools

To simplify model development



Visual Studio Code



Azure Notebooks



Jupyter



Command line

Popular frameworks

To build advanced deep learning solutions



PyTorch



TensorFlow



Scikit-Learn



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

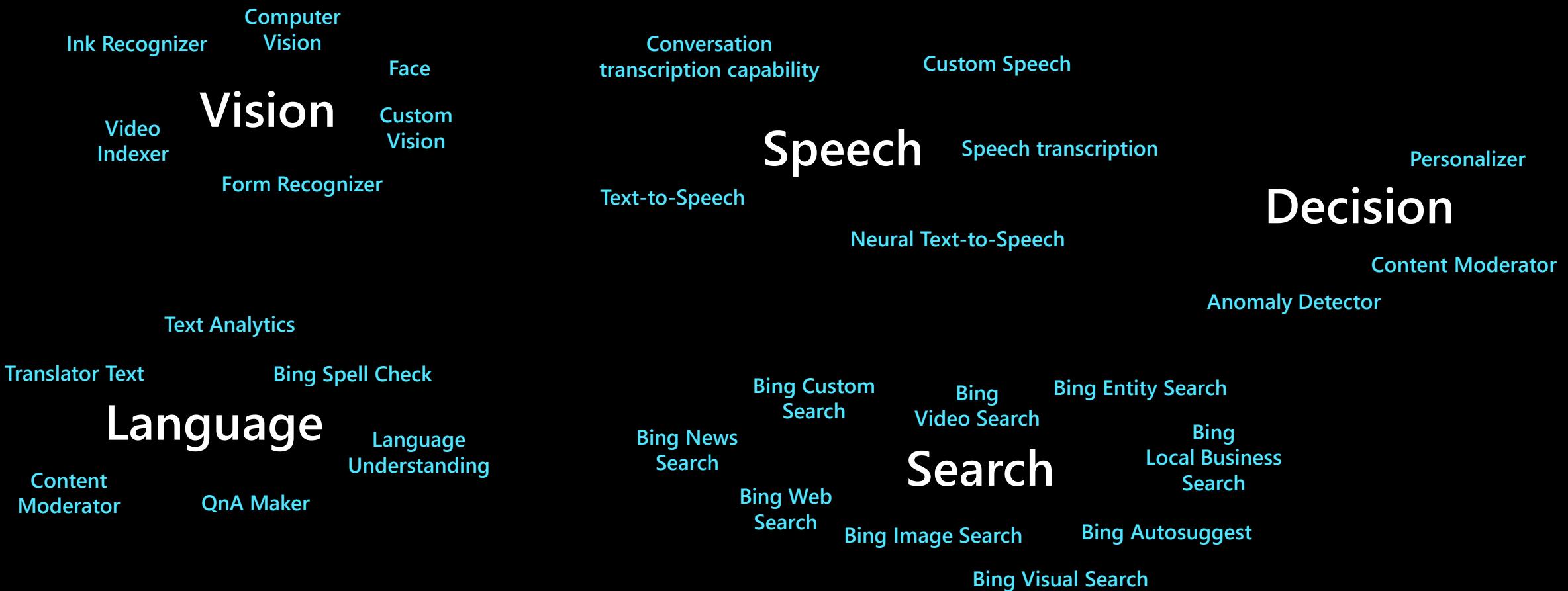


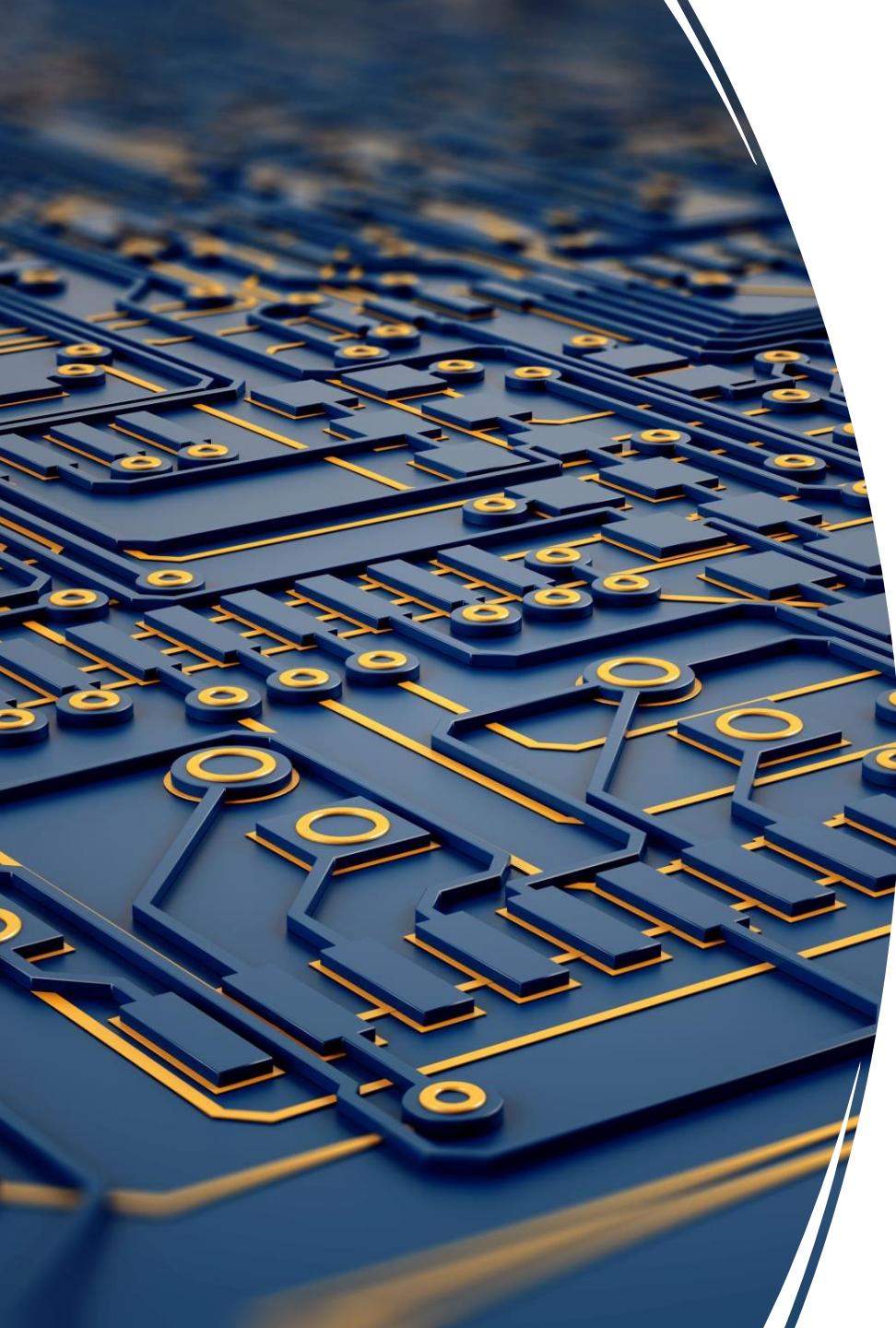
From the Intelligent Cloud to the Intelligent Edge



Azure Cognitive Services

The most comprehensive pre-trained AI





What is Computer Vision?

Main Types of Computer Vision Algorithms

IMAGE CLASSIFICATION

What are my images
about?



OBJECT DETECTION

Locate rectangular areas
containing known objects
in an image



Image Classification Common Scenarios



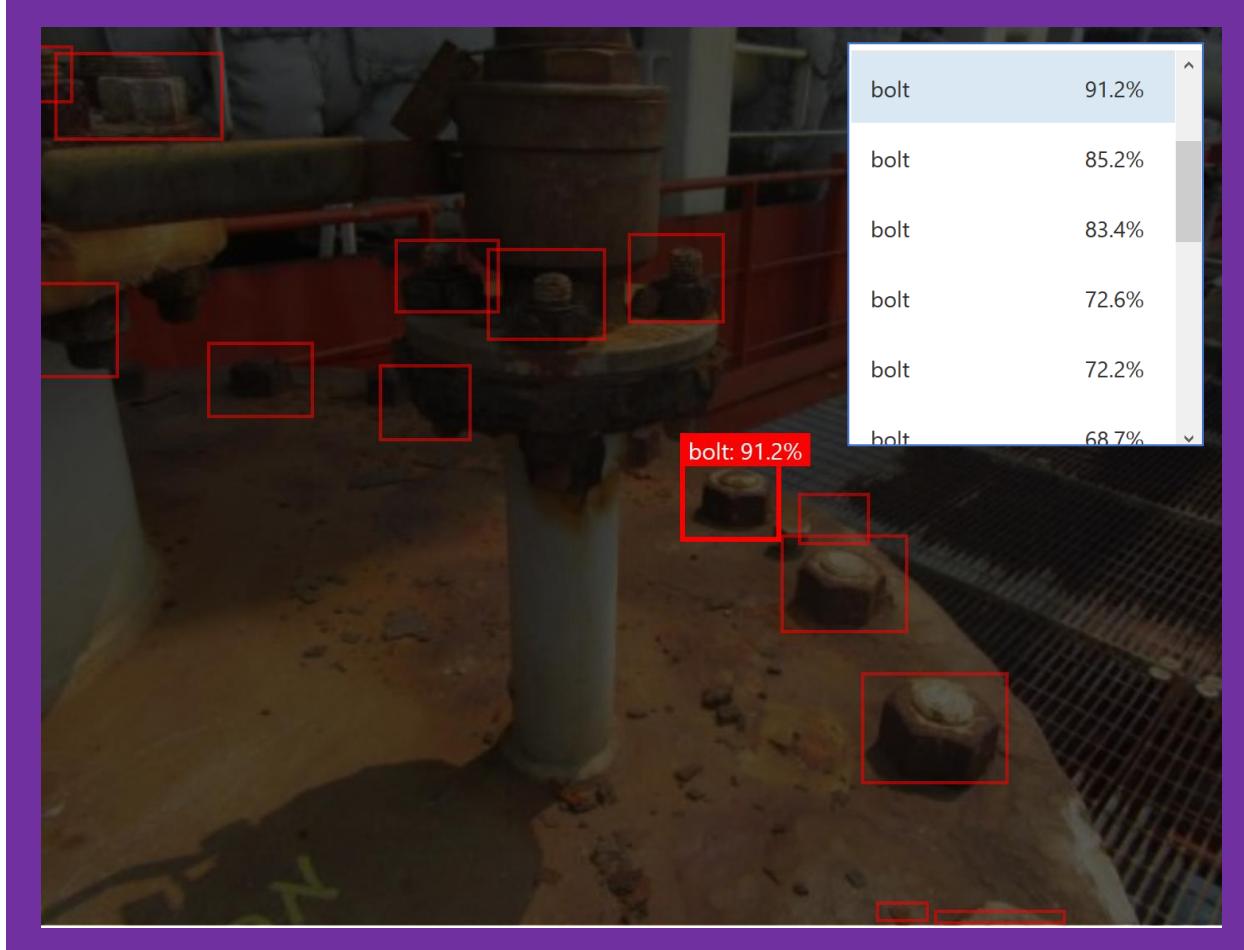
- Automated sorting
- Similar themed image search
- Context & situation detection

Scaffold 95.0%

Guardrail 89.3%

Water 60.7%

Object Detection Common Scenarios



- Object counting
- Locate an object or a group of objects
- Size / measurements

Some computer vision references

In IoT Computer Vision is about converting Cameras into Sensors

Retail



Industrial



Smart spaces



Shell invests in safety with Azure, AI, and machine vision to better protect customers and service champions

In the energy industry, Shell manages everything from wells to retail gas stations—44,000 of them. The company works hard to ensure the safety of service champions and customers at its retail sites. Shell is piloting a new cloud-based, deep learning solution built on Microsoft Azure. The solution uses closed-circuit camera footage and Internet of Things technology to automatically identify safety hazards and alert service champions so they can quickly respond and eliminate potential problems.



Products and Services

Microsoft Azure
Azure Databricks
Azure IoT Edge
Azure IoT Hub

Organization Size

86,000 employees

Industry

Mining, Oil and Gas

Country

The Netherlands



Bühler's mission is to improve food quality and safety

Bühler's LumoVision solution is a data-driven optical grain sorter that is connected to Azure for data analysis. It uses powerful cameras and ultraviolet lighting to hunt for hidden infections, sorting good corn from bad corn.



▷ [Watch](#)

Rail company digitizes business



[Click to learn more](#)



Products and Services

Microsoft IoT Hub
Microsoft IoT Edge
Microsoft Power BI

réalise des relevés **topographiques** avec des **drones** et des **robots**.



Organization Size

270,000 employees

Industry

Travel & Transportation

Country

France



<https://customers.microsoft.com/fr-fr/story/altametris-viseo-azure-travel-transportation-france-fr>



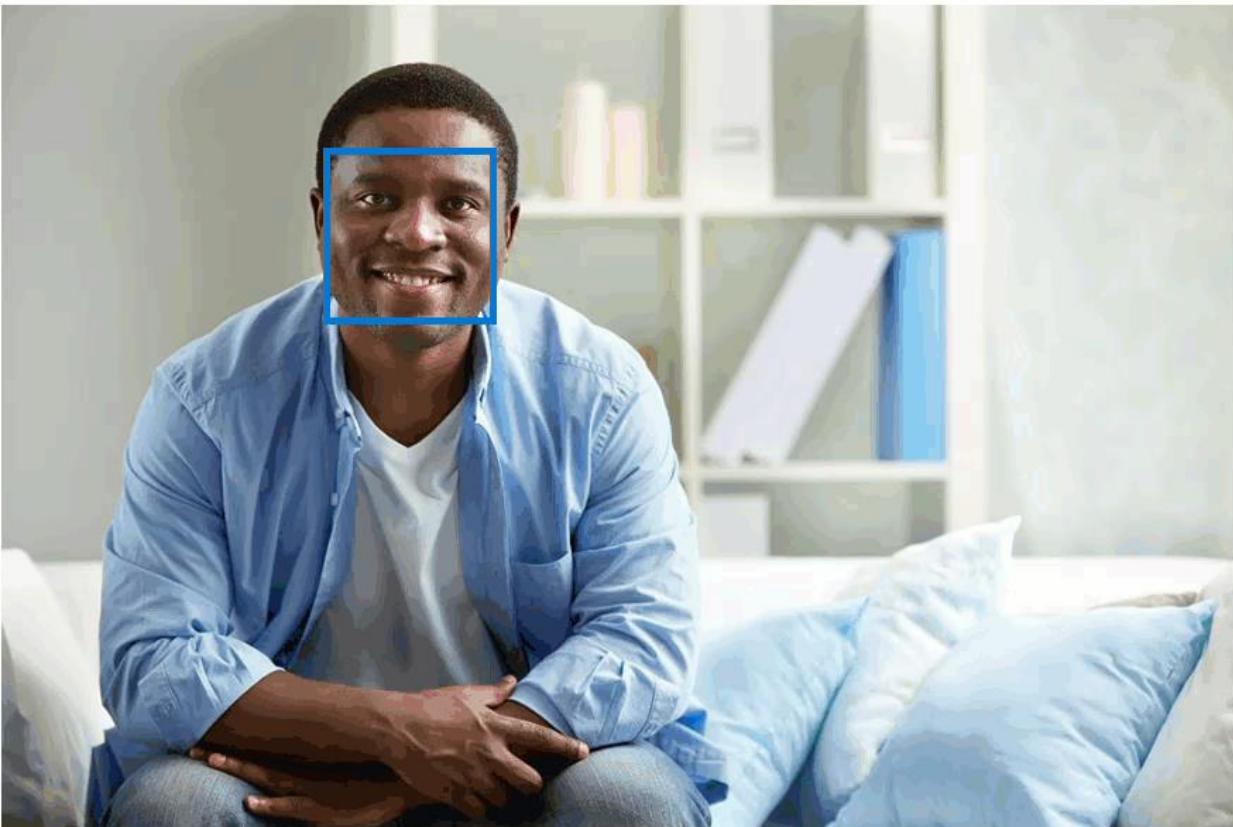
Vision

From faces to feelings, allow your apps to understand images and video

Computer Vision | Video Indexer | Custom Vision |
Face | Content Moderator



Face



```
},
"smile": 1.0,
"headPose": {
  "pitch": 0.0,
  "roll": 3.2,
  "yaw": 11.4
},
"gender": "male",
"age": 30.0,
"facialHair": {
  "moustache": 0.4,
  "beard": 0.4,
  "sideburns": 0.4
},
"glasses": "NoGlasses",
"makeup": {
  "eyeMakeup": false,
  "lipMakeup": false
},
"emotion": {
  "anger": 0.0,
  "contempt": 0.0,
  "disgust": 0.0,
  "fear": 0.0
}
```

Face



Face detection

Detect faces and their attributes within an image

Face verification

Check if two faces belong to the same person

Similar face searching

Find similar faces within a set of images

Face grouping

Organize many faces into groups

Face identification

Search which person a face belongs to



Emotion

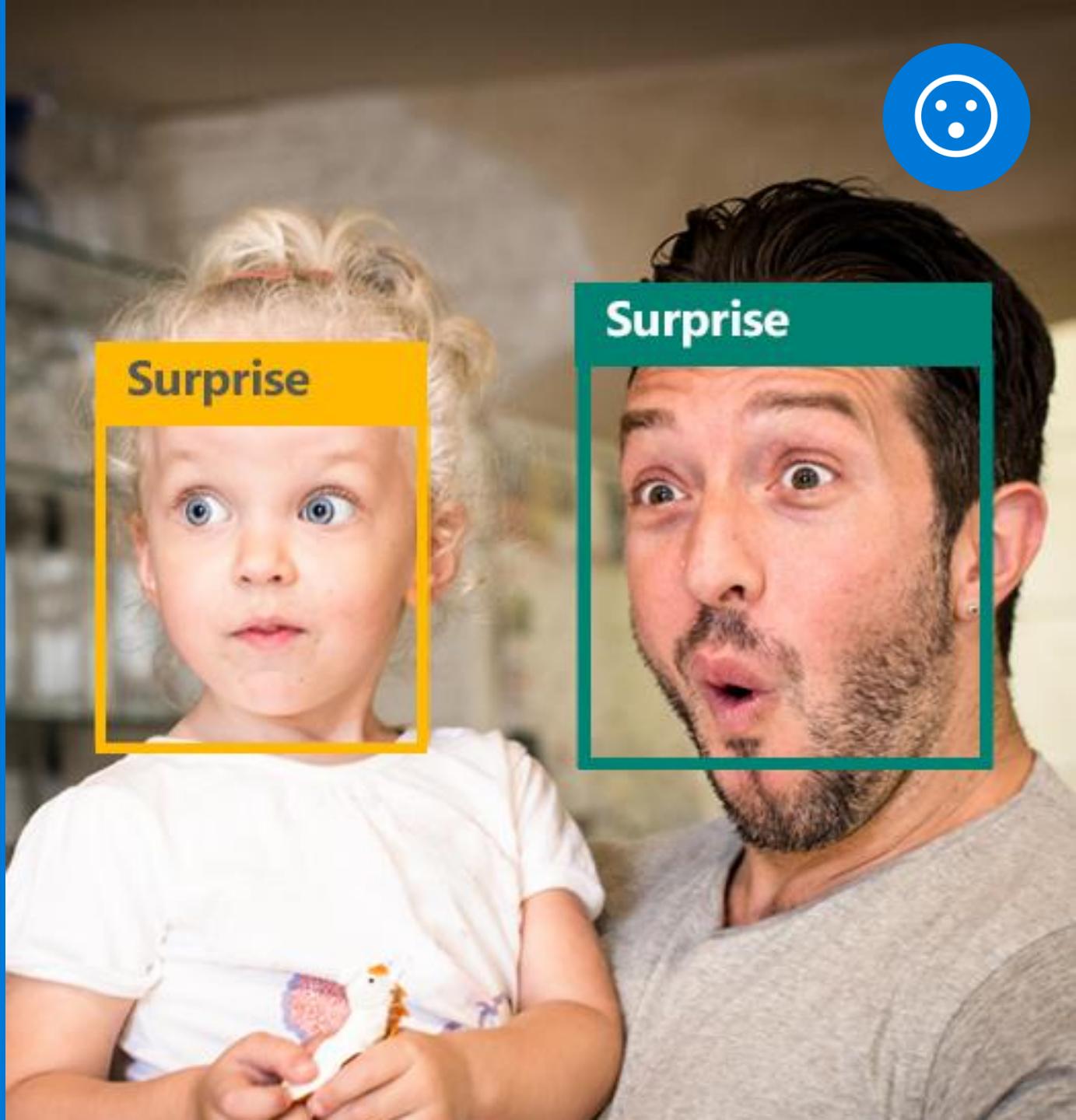


Face detection

```
"faceRectangle": {"width": 193,  
                 "height": 193,  
                 "left": 326,  
                 "top": 204} ...
```

Emotion scores

```
"scores": { "anger": 5.182241e-8,  
            "contempt": 0.0000242813,  
            "disgust": 5.621025e-7,  
            "fear": 0.00115027453,  
            "happiness": 1.06114619e-8,  
            "neutral": 0.003540177,  
            "sadness": 9.30888746e-7,  
            "surprise": 0.9952837}
```



Computer Vision

Analyze an image

Understand content within an image

OCR

Detect and recognize words within an image

Generate thumbnail

Scale and crop images, while retaining key content

Recognize celebrities

Thanks to domain-specific models, ability to recognize 200K celebrities from business, politics, sports, and entertainment around the world



Form Recognizer

Form Recognizer uses advanced machine learning technology to quickly and more accurately extract text and data from business's forms and documents.

With container support, this service can run on-premises and in the cloud.

Automate information extraction quickly and tailor to specific content, with only 5 samples, and no manual labeling.

The screenshot shows a mobile application interface for 'BlueInvoice'. At the top, it displays '1 / 1' and icons for download and print. Below this is a header for 'Contoso'. The main content area shows an invoice with the following details:

Bill To:	Contoso, Ltd	Phone:	432-555-0189	Invoice #:	3-456-2
		Fax:	432-555-0123	Invoice Date:	4/14/2019
Email: contoso@example.com					

Below the header, there is a section labeled 'Invoice For: Project 2'. A table lists nine items with their descriptions, quantities, unit prices, discounts, and total prices:

Item #	Description	Qty	Unit Price	Discount	Price
24567	Invoice 3-456-2 Data 1	39	\$ 5.00	\$ -	\$ 195.00
24568	Invoice 3-456-2 Data 2	40	4.00	5.00	160.00
24569	Invoice 3-456-2 Data 3	30	6.00	7.00	170.00
24570	Invoice 3-456-2 Data 4	40	7.00	-	280.00
24571	Invoice 3-456-2 Data 5	10	4.00	-	40.00
24572	Invoice 3-456-2 Data 6	5	8.00	-	40.00
24573	Invoice 3-456-2 Data 7	70	6.00	-	420.00
24574	Invoice 3-456-2 Data 8	25	4.00	-	100.00
24575	Invoice 3-456-2 Data 9	5	7.00	3.00	32.00

On the right side of the screen, there are three circular buttons with icons: a left arrow, a right arrow, and a plus sign.

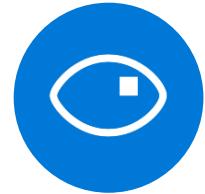
The screenshot shows the Azure portal interface with a preview of the JSON output from the Form Recognizer. The JSON data includes the following fields:

```
Preview JSON
```

Bill To: Contoso, Ltd
Phone: 432-555-0189
Invoice #: 3-456-2
Fax: 432-555-0123
Invoice Date: 4/14/2019
Email: contoso@example.com
Invoice For: Project 2
Invoice Subtotal: 2,014.00
Tax Rate: 8.75%
Sales Tax: 176.23
Other: 0

At the bottom of the JSON panel, there is a note: "Total amount due is 0.00. Due date is 0001-01-01. Subject to a service charge of 20%".

<https://azure.microsoft.com/en-us/services/cognitive-services/form-recognizer/>



Content Moderator

Machine-assisted moderation of text and images, augmented with human review tools

Image moderation

Machine-learning based classifiers, custom blacklists, and Optical Character Recognition (OCR)

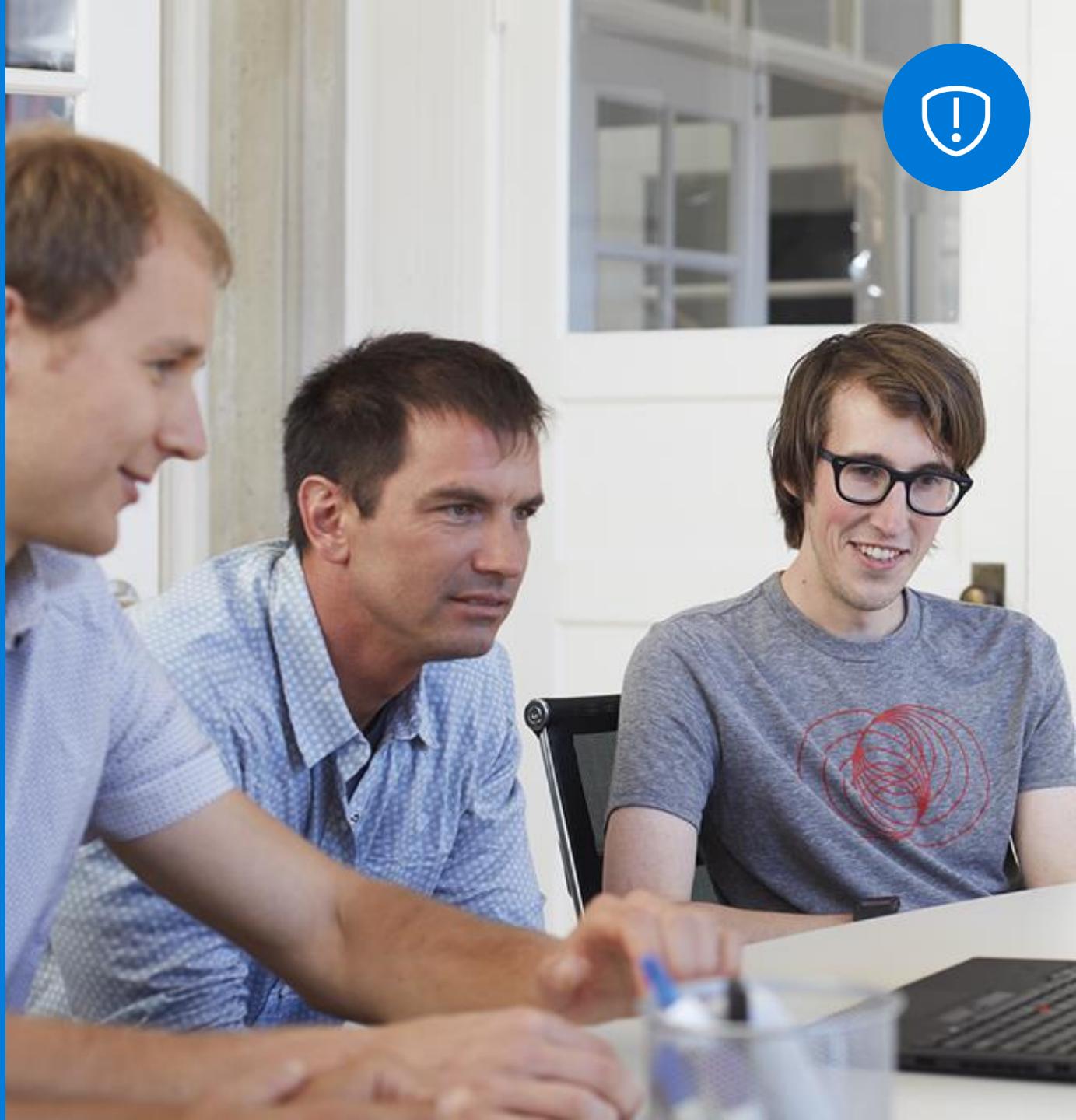
Text moderation

Helps you detect potential profanity in more than 100 languages and match text against your custom lists automatically.

Identification of possible Personally Identifiable Information (PII)

Video moderation (in Azure Media Services)

Scoring of possible adult content in videos.
Video moderation is currently deployed in preview on Azure Media Services



Custom Vision

A customizable web service that learns to recognize specific content in imagery

Upload images

Upload your own labeled images, or use Custom Vision Service to quickly tag any unlabeled images

Train

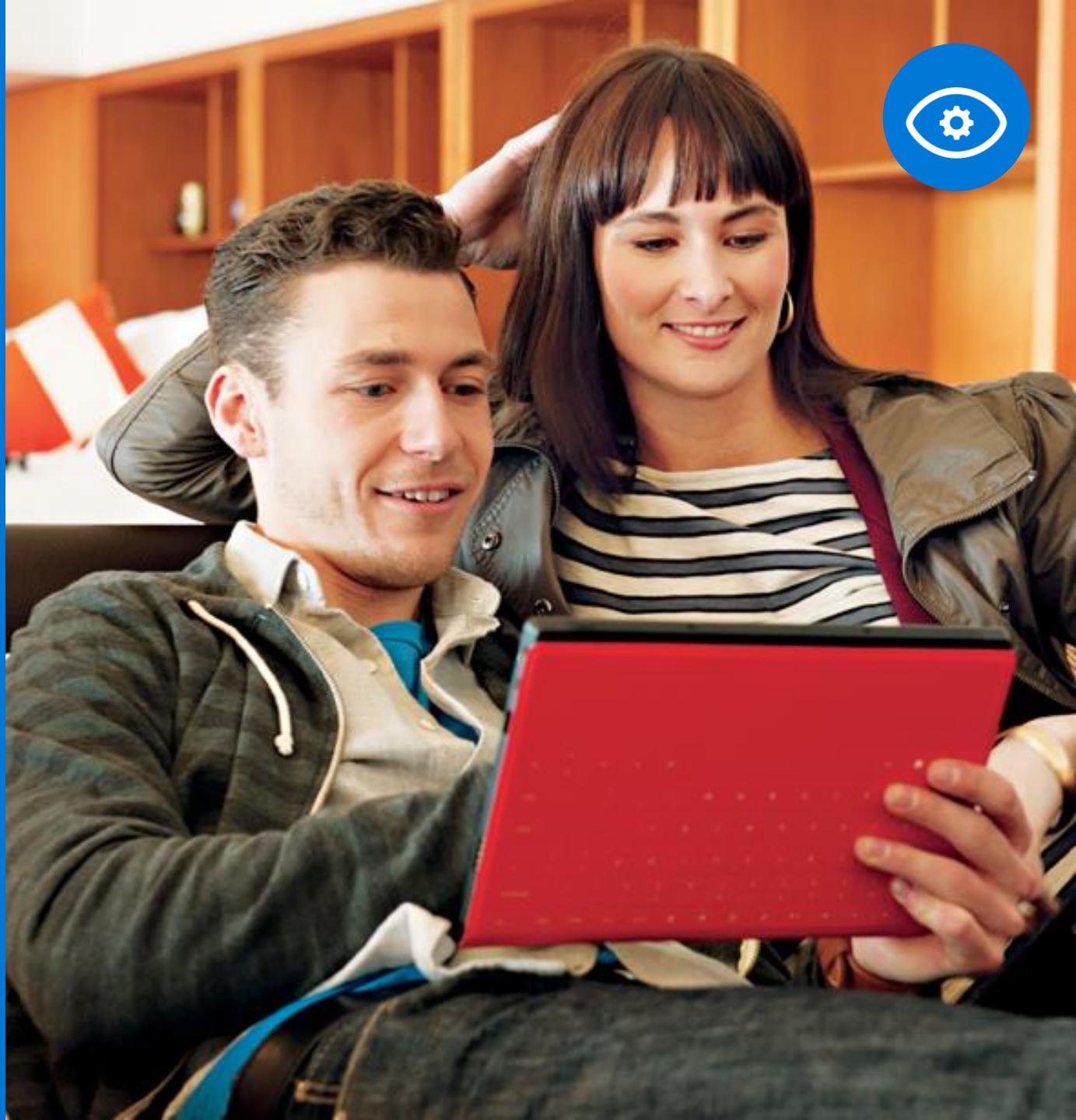
Use your labeled images to teach Custom Vision Service the concepts you want it to learn

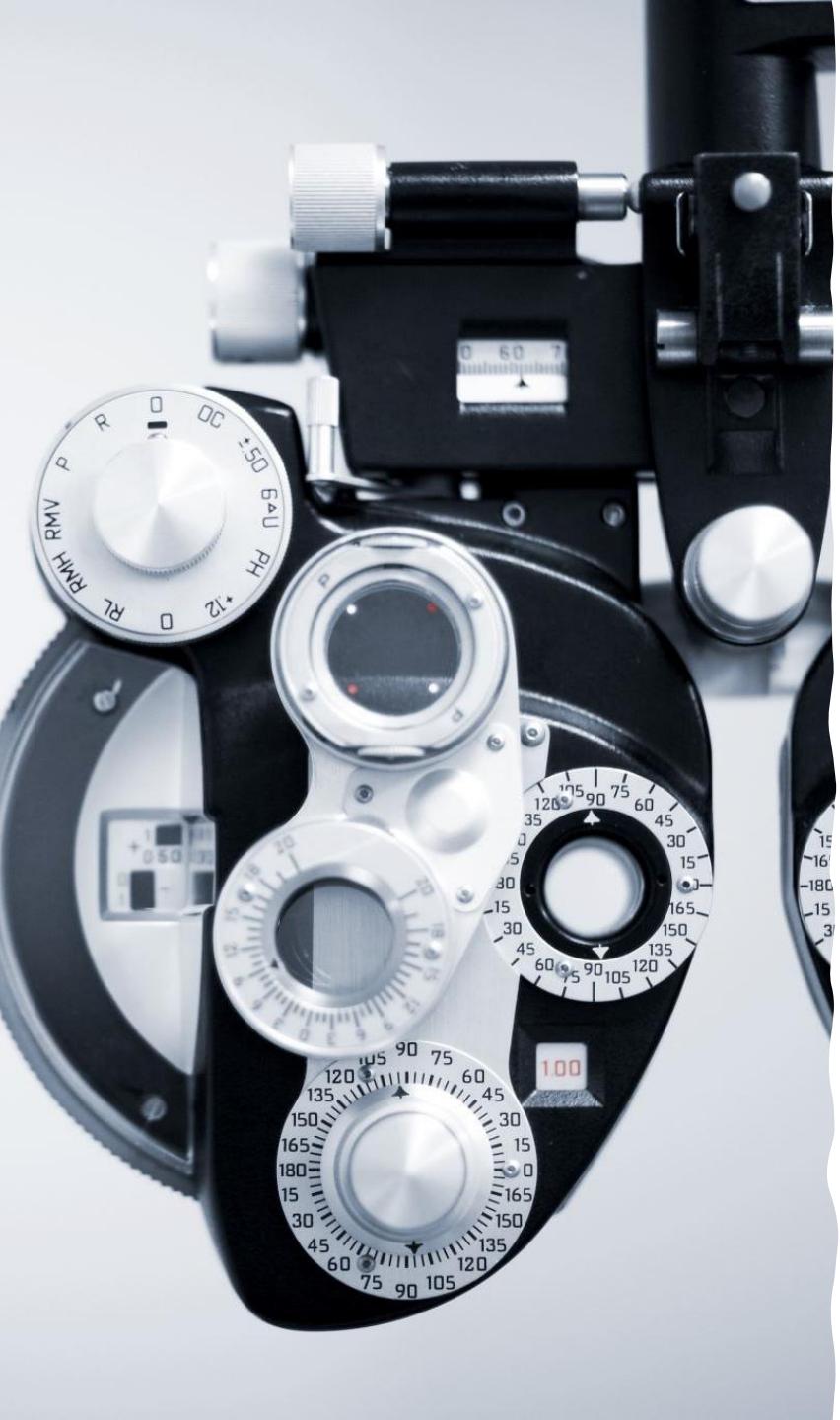
Evaluate

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

Active learning

Images evaluated through your custom vision model become part of a feedback loop you can use to keep improving your classifier





Custom Vision



Custom Vision

A customizable web service that learns to recognize specific content in imagery

Upload images

Upload your own labeled images, or use Custom Vision Service to quickly tag any unlabeled images

Train

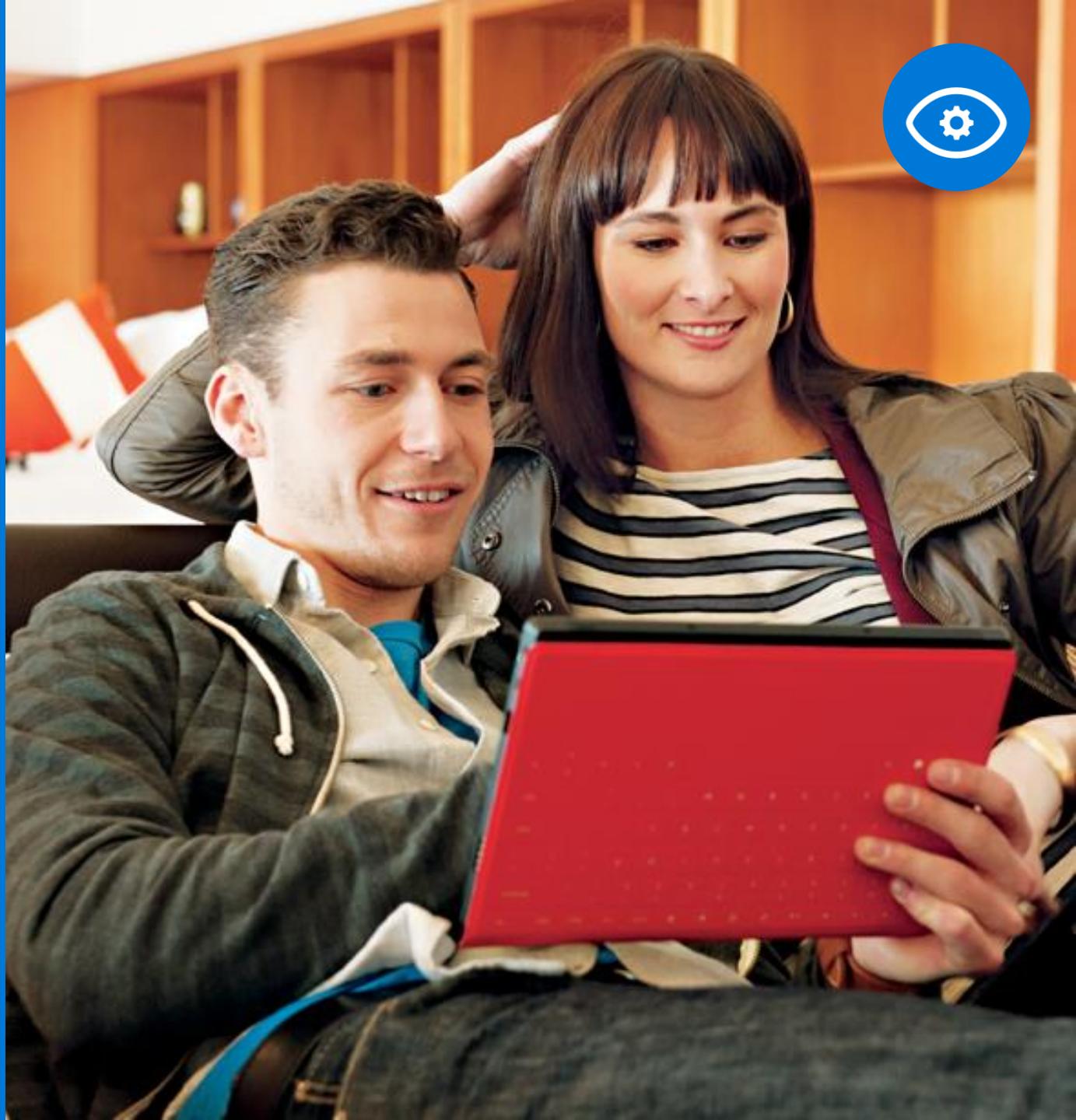
Use your labeled images to teach Custom Vision Service the concepts you want it to learn

Evaluate

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

Active learning

Images evaluated through your custom vision model become part of a feedback loop you can use to keep improving your classifier



Custom Vision

Customize

Design your own state-of-the-art models for unique use cases

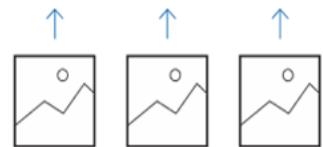
Upload

Use labeled images to quickly train and update your models

Export

Run models on a device or as a Docker container with just one click

www.customvision.ai



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 for categorisation

Screenshot of the Microsoft Custom Vision Studio interface showing a training session for vehicle categorization.

The interface includes:

- Left Sidebar:** Shows the workspace "Voitures".
 - Iteration:** Set to "Workspace".
 - Tags:** Filtered to "Tagged".
 - Showing: all tagged images.
 - Search For Tags:
 - Options: BMW 20, Ferrari 20, Mercedes 20, Peugeot 20, Renault 20, Rolls 20, Tesla 20.
- Top Navigation:** Training Images (selected), Performance, Predictions, Train (green button), Quick Test, Help, User Profile.
- Image Grid:** A grid of 12 car images used for training, including models from BMW, Renault, and other brands.
- Pagination:** Page 1 of 3.
- Right Panel:** Predictions table (circled in red).

Tag	Probability
Renault	99.8%
BMW	22.4%
Peugeot	4.4%
Tesla	1.7%
...	...
- Input Area:** Enter Image URL or Browse local files.
- Model Information:** Using model trained in Iteration 4.

Custom Vision for Object Detection



Car Driver

Training Images Performance

Filter Add images Delete Select all

Iteration Workspace

Tags Tagged Untagged

Showing: all tagged images

Search For Tags:

- Attention issue 20 ...
- Calling 20 ...
- Drinking 20 ...
- Not viewing the... 20 ...
- OK 20 ...
- Phone manipulation 20 ...

Regions Shown Undo Changes

My Objects Phone manipulat... X

Predicted Object Filter Probability Threshold: 15% ⓘ

Predictions
Predictions are shown in red

Tag	Probability
Phone manipulation	83.4%
Attention issue	64.6%
Phone manipulation	16.8%

<https://www.kaggle.com/c/state-farm-distracted-driver-detection>



Video Indexer

Video Indexer

Unlock video insights

Upload your video and go

Start turning your video into insights right away.

Make your content more discoverable

Enhance content discovery experiences such as search results by detecting spoken words, faces, characters, and emotions

Improve engagement with your video

Metadata extracted by Video Indexer can be used to build powerful engagement experiences with recommendations, highlight clips, and interactive videos



Video Indexer – www.videoindexer.ai



Azure Media Services | Video Indexer + Create new account Account seretkow-5dc864 WUS2 ↴

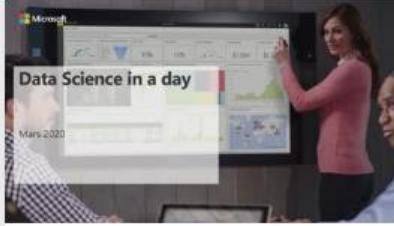
Search inside your videos
Find the exact moments you're looking for by text, by person, or even by object.

Find topics Find people

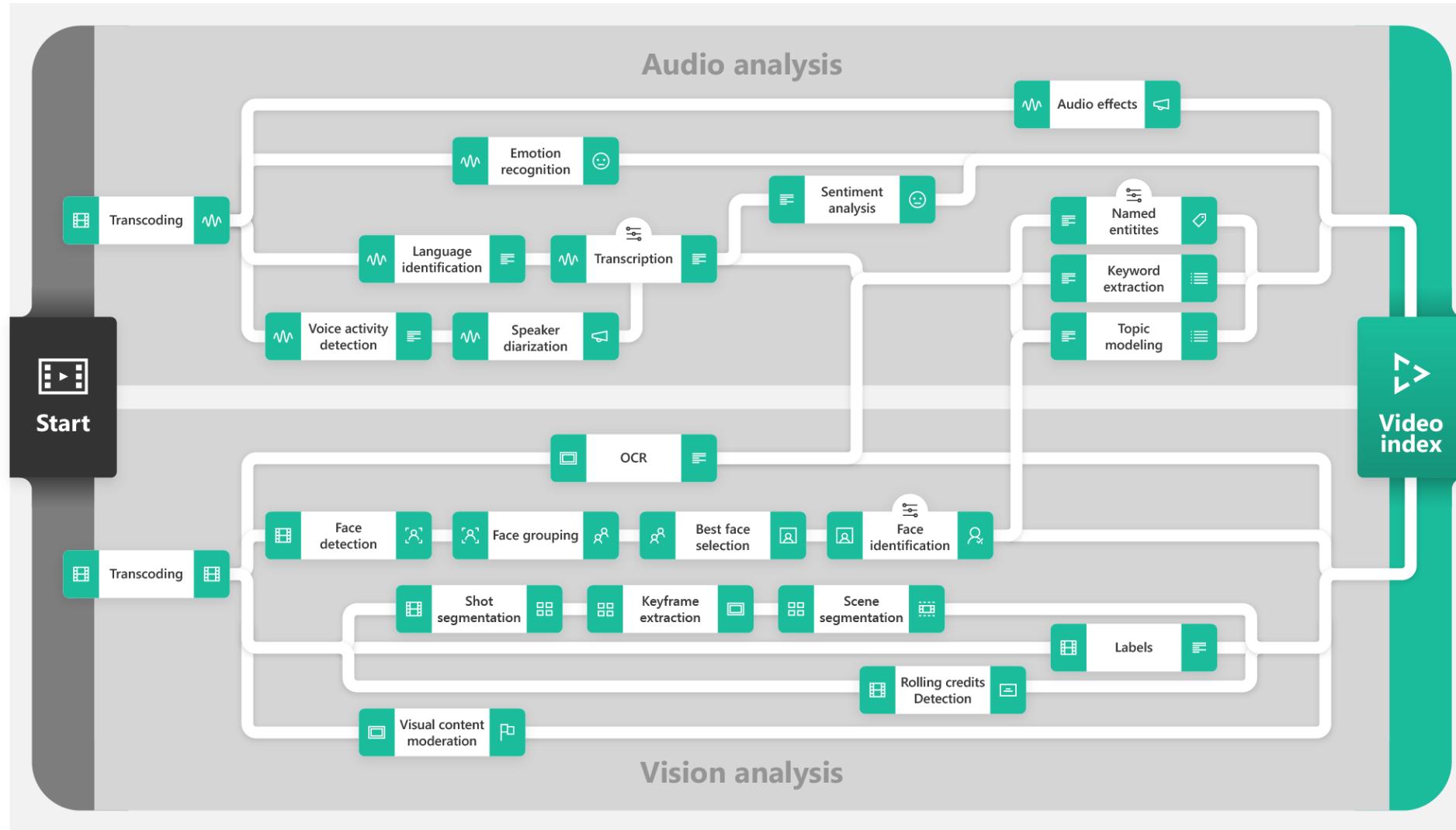
Search for text, keywords, or visual content Search for people and celebrities

Show more filters ▾

Library Projects

Thumbnail	Video Title	Created by
	1. Introduction	Serge Retkows...
	Teams	Serge Retkows...
	READY 2019	Serge Retkows...
	Get started with Microsoft Cogniti...	Serge Retkows...
	THE MULE Official Trailer (2018) Cl...	Serge Retkows...

Azure Video Indexer for video content analysis





Speech services

Hear and speak to your users by filtering noise, identifying speakers, and understanding intent



Speech

Unified Speech service |
Speech to Text | Text to Speech | Speech Translation
Speaker Recognition

Baseline Speech Recognition

"Show me all flights from Pittsburgh to Boston **is directly** connecting that **Martin pitch burgh** after 7."

Custom Speech Recognition

"Show me all flights from Pittsburgh to Boston **both directed** connecting that **depart Pittsburgh** after 7 PM."

Unified Speech



Combine speech recognition, text-to-speech, customized voice models, and translation service

Speech to text

Convert continuous human speech to text that can be used as inputs

Text to speech

Convert text to audio files of natural-sounding speech

Speech translation

Use text or speech to provide translations of speech to other languages



Speaker Recognition

Speaker verification

Check if two voices are the same

Speaker identification

Identify who is speaking



Bing Speech

Voice recognition (speech to text)

Converts spoken audio to text

Voice output (text to speech)

Synthesize audio from text

Speech intent recognition

Convert spoken audio to intent



Custom Speech

Customize both language and acoustic models

Tailor speech recognition to your app and environment



Translator Speech



Facilitate end-to-end, real-time speech translations in over 60 languages

Transcribe and translate

Optimize translations for real-life conversations

Customize

Personalize speech recognition, translations, and speech-to-text to your specific domain or scenario

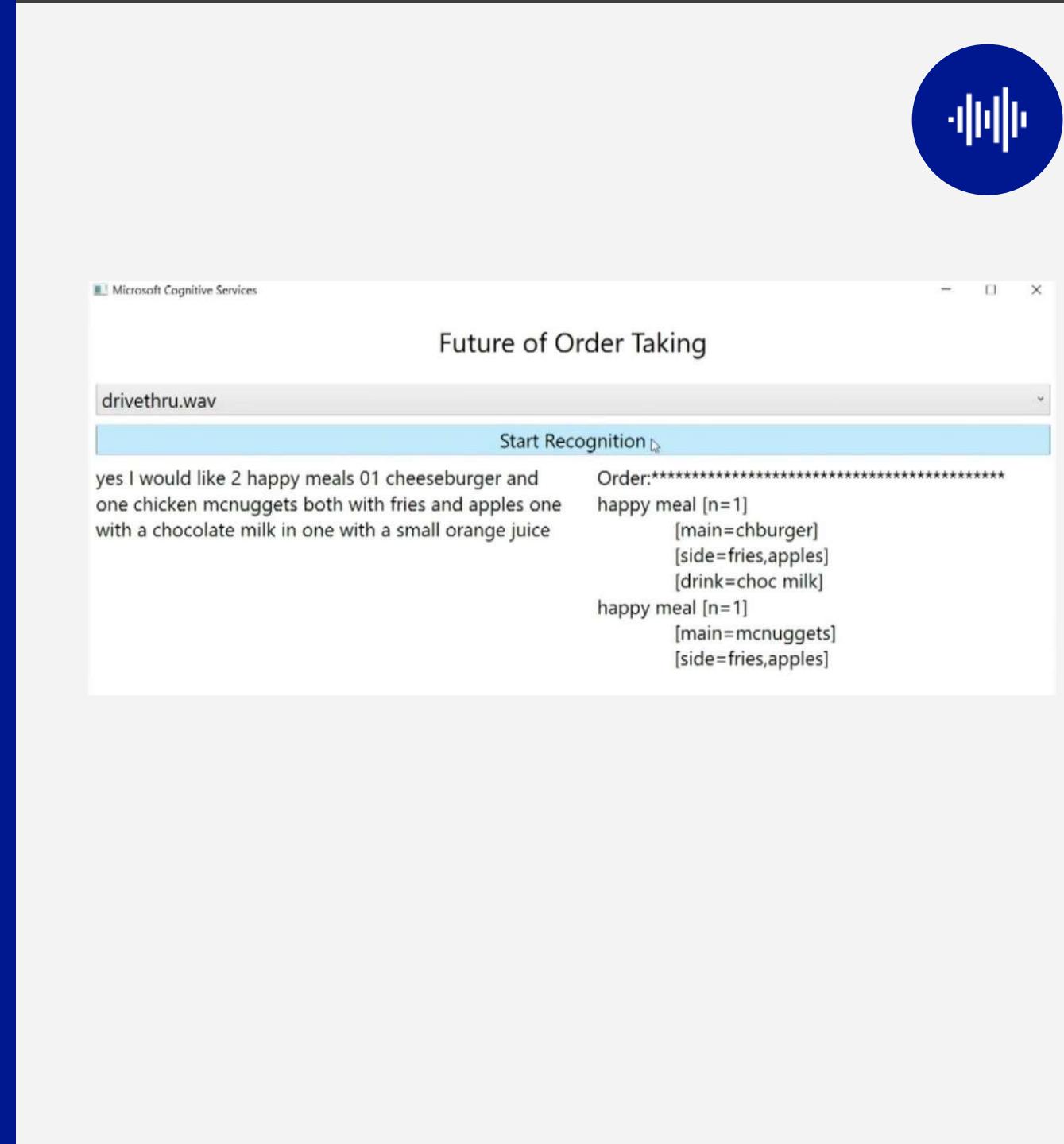


Mc Donald's use case

Speech to Text to POS

Fast food giant McDonald's is using cognitive technology to convert drive-through orders to text that can be fed directly into the outlet's point-of-sale system.

<https://www.youtube.com/watch?v=KxvU5I2w210>



Translator



<https://translаторmicrosoft.com>

The screenshot shows the Microsoft Translator website interface. At the top, there's a navigation bar with the Microsoft logo, followed by tabs for "Translator", "Texte", "Conversation" (which is highlighted in blue), "Apps", "Pour les entreprises", and "Aide". Below the navigation bar is a blurred background image of a person in a library setting. In the center, there's a large icon of two people talking. The text "Brisez la barrière de la langue" is displayed above a paragraph about cross-device translation for one-on-one and group interactions. On the right side, there are buttons for "Rejoindre conversation" and "Démarrer conversation", and social media links for Windows, Facebook, and Google+. At the bottom right, there are links for "Confidentialité et cookies" and "Accord sur les services".

Language services



```
mirror_mod = modifier_obj
# Set mirror object to mirror
mirror_mod.mirror_object = mirror_obj
if operation == "MIRROR_X":
    mirror_mod.use_x = True
    mirror_mod.use_y = False
    mirror_mod.use_z = False
elif operation == "MIRROR_Y":
    mirror_mod.use_x = False
    mirror_mod.use_y = True
    mirror_mod.use_z = False
elif operation == "MIRROR_Z":
    mirror_mod.use_x = False
    mirror_mod.use_y = False
    mirror_mod.use_z = True
```

```
#selection at the end -add
if ob.select= 1
    mirror_ob.select=1
    context.scene.objects.active = mirror
    mirror.select = 0
    bpy.context.selected_objects.append(mirror)
    data.objects[one.name].select = 1
```

```
print("please select exactly one object")
```

```
- OPERATOR CLASSES ---
```

```
types.Operator):
    X mirror to the selected
    object.mirror_mirror_x"
    mirror X"
```

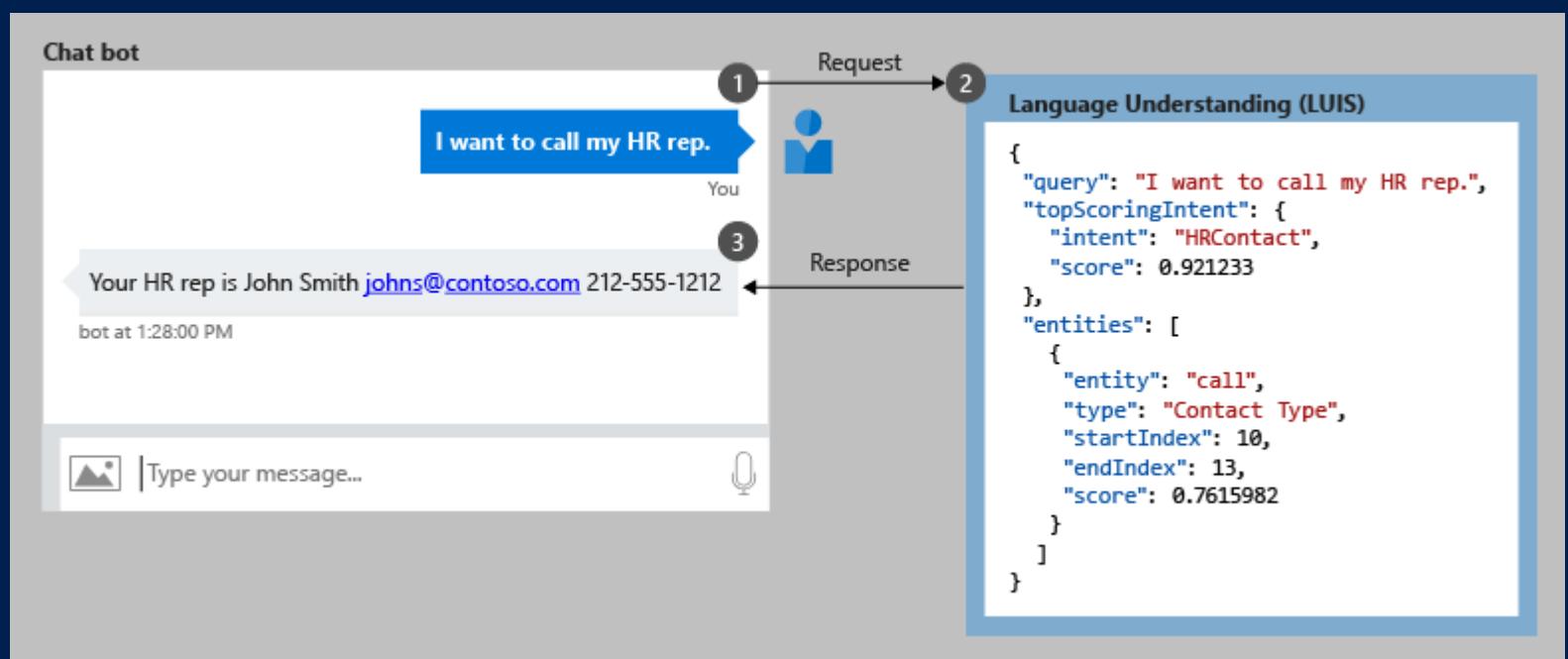
```
context):
    next.active_object is not None
```

99

Language

Process text and learn how to recognize what users want

Text Analytics | Bing Spell Check | Language Understanding | Translator Text | Q&A Maker



Text Analytics



Sentiment analysis

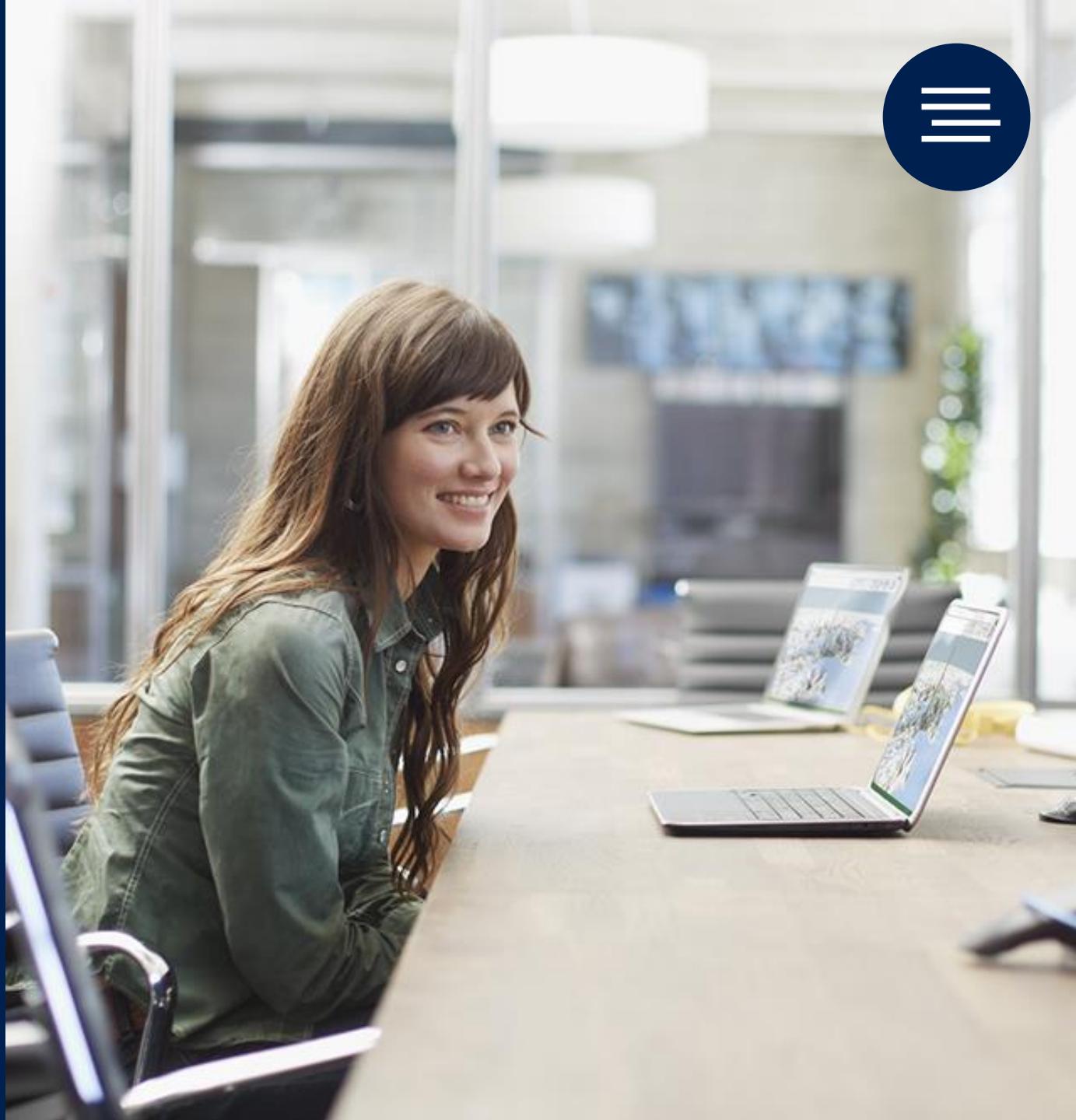
Understand if a record has positive or negative sentiment

Key phrase extraction

Extract key phrases from a piece of text, and retrieve topics

Language detection

Identify the language, 120 supported languages



Text Analytics

Analyze

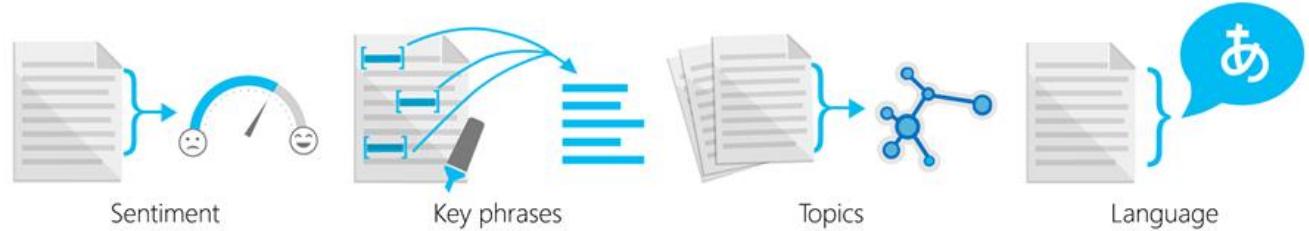
Generate a sentiment score using unique classification techniques

Detect

Return detected language and numeric scores to indicate certainty

Extract

Use Natural Language Processing to denote key talking points



I had a wonderful trip to Seattle and enjoyed seeing the Space Needle!

Analyzed text JSON

LANGUAGES: English (confidence: 100 %)

KEY PHRASES: Seattle, wonderful trip, Space Needle

SENTIMENT: 98 %

ENTITIES: Seattle [Location]
Space Needle [Location]

NAMED ENTITY RECOGNITION: I had a wonderful trip to [Seattle](#) and enjoyed seeing the [Space Needle](#)!

Analyze

Bing Spell Check

State-of-the-art cloud-based spelling algorithms

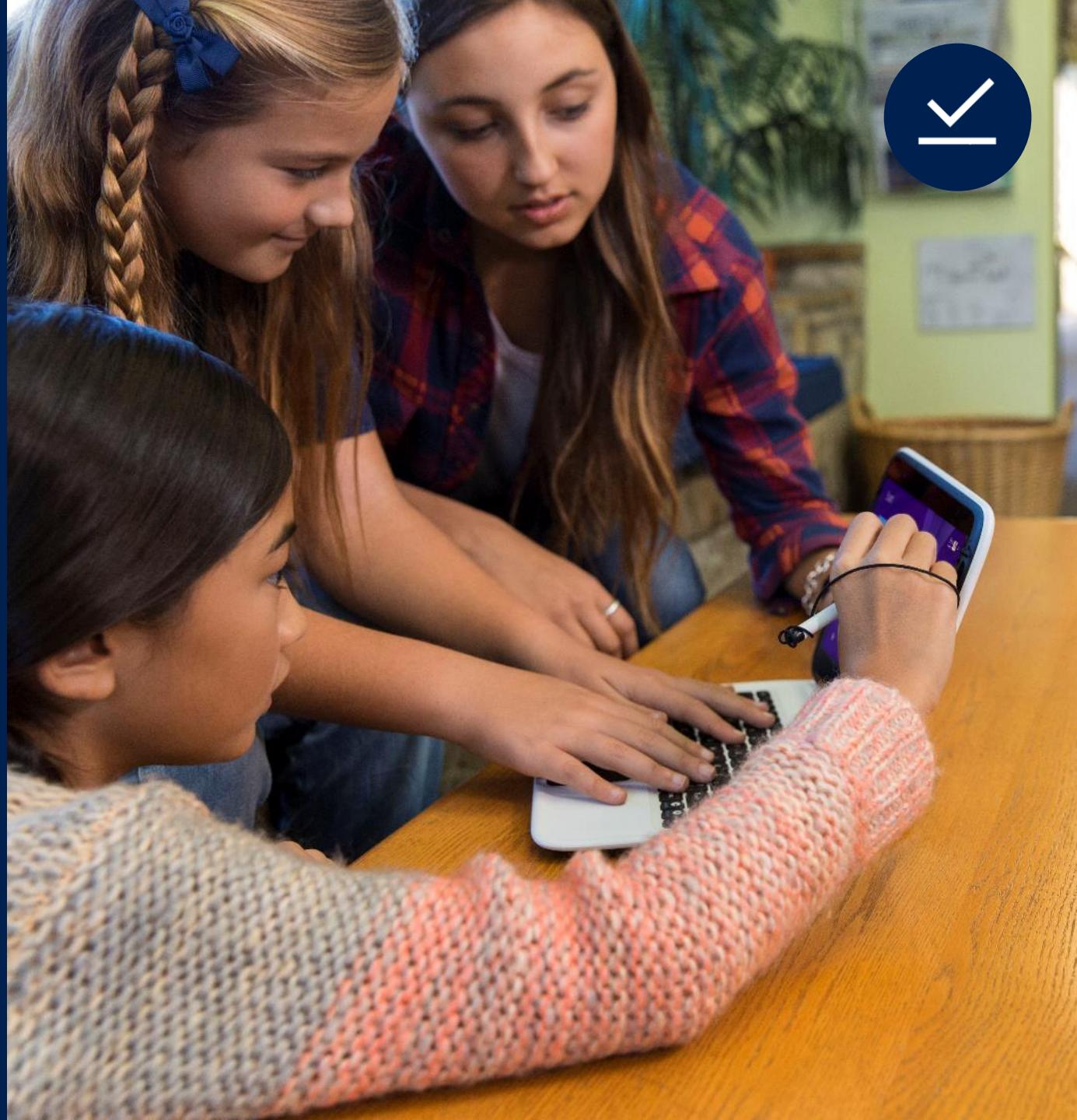
Recognizes a wide variety of spelling errors

Recognize name errors and homonyms in context

Difficult-to-spot errors that use the context of the words around them

Updates over time

Support for new brands and coined expressions as they emerge



Translator Text

Conduct real-time translation
with a REST API call

Automatic detection

Accurately detect specific languages
on any text string

Transliterate

Translate and display text
in different language alphabets

Speech translation

Build custom NTM models that better
handle writing styles and expressions



Language Understanding Intelligent Service

**Understand what
your users are saying**

Use pre-built Bing and Cortana
models or create your own



Language Understanding Models

“News about
flight delays”



```
{  
  "entities": [  
    {  
      "entity": "flight_delays",  
      "type": "Topic"  
    }  
  ],  
  "intents": [  
    {  
      "intent": "FindNews",  
      "score": 0.99853384  
    },  
    {  
      "intent": "None",  
      "score": 0.07289317  
    },  
    {  
      "intent": "ReadNews",  
      "score": 0.0167122427  
    },  
    {  
      "intent": "ShareNews",  
      "score": 1.0919299E-06  
    }  
  ]  
}
```

A large blue circle in the top right corner contains the text "{ }".

QnA Maker

Build, train, and publish simple question and answer bots

QnA extraction

Use existing content to respond to users naturally

Expanded response

Integrate with other APIs to expand question interpretations

Train and improve

Add and remove QnA pairs to improve your bot's knowledge



QnA Maker

Update

Manage knowledge base content and settings

Analyze

Monitor analytics and feedback

Publish

Deploy endpoint in a bot

Test

Verify query matching ranking

Who should use QnAMaker?



Answer:

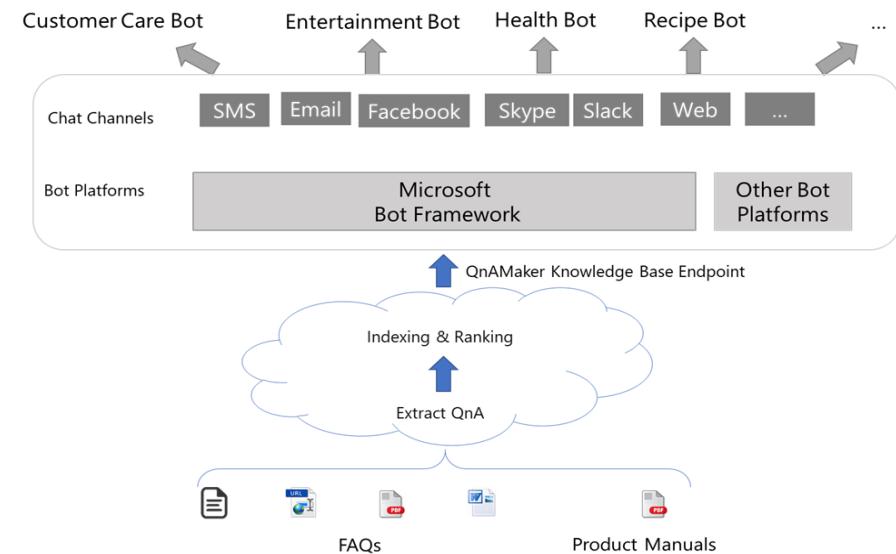
QnA Maker provides an FAQ data source that you can query from your bot or application. Although developers will find this useful, content owners will especially benefit from this tool. QnA Maker is a completely no-code way of managing the content that powers your bot or application.

Score:

100

Matched questions:

- who is the target audience for the qna maker tool
- who should use qnamaker

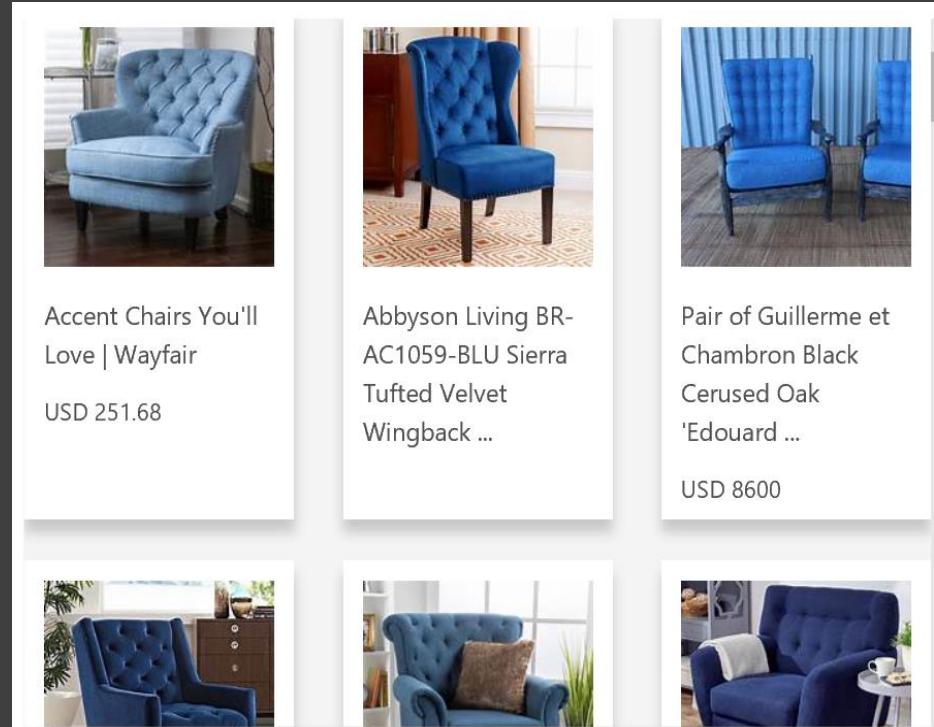


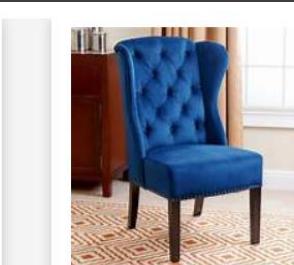
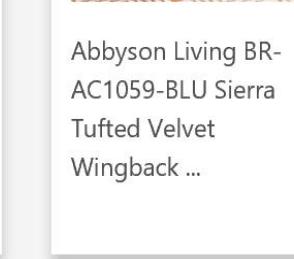


Search services

Access billions of web pages, images, videos, and news with the power of Bing APIs

Bing Web Search | Bing Custom Search | Bing Video Search |
Bing Image Search | Bing Visual Search | Bing Entity Search |
Bing News Search | Bing Autosuggest | Bing Statistics add-in

A grid of six images showing different styles of blue upholstered chairs, likely results from a search query.

 Accent Chairs You'll Love Wayfair USD 251.68	 Abbyson Living BR-AC1059-BLU Sierra Tufted Velvet Wingback ...	 Pair of Guillerme et Chambron Black Cerused Oak 'Edouard ... USD 8600
		

Bing Web Search

Quickly narrow your search results by market, freshness, result type, search category, and more

Submit a customized query to return the most accurate results for your location

[SDOT Bike Web Map - Transportation | seattle.gov](#)
www.seattle.gov/transportation/projects-and-programs/programs/bike...
From in-street Sharrows to fully separated Protected Bike Lanes and Multi-Use Trails, ... Seattle Department of Transportation PO Box 34996 Seattle, WA 98124-4996

Name "Online Bicycle Map",

URL "<http://www.seattle.gov/transportation/projects-and-programs/programs/bike-program/online-bike-map>"

Date Accessed: "2018-05-19T07:32:00Z",

About "Transportation in Seattle"

seattle bike trails 

Market

en-us (English-United States)

SafeSearch

Strict

Freshness

(unspecified)

[SDOT Bike Web Map - Transportation | seattle.gov](#)

www.seattle.gov/transportation/projects-and-programs/programs/bike...

From in-street Sharrows to fully separated Protected Bike Lanes and Multi-Use Trails, ... Seattle Department of Transportation PO Box 34996 Seattle, WA 98124-4996

[Seattle Bike Trails - Seattle Outdoors Information ...](#)

www.seattleoutdoorsinfo.com/.../seattle-biking/seattle-bike-trails

Current information about hiking, camping, biking, winter sports, and just about anything that involves exploring the Pacific Northwest, with special focus on Seattle.

[Seattle Trails & Detailed Trail Maps | TrailLink.com](#)

<https://www.traillink.com/city/seattle-wa-trails>

Looking for the best trails around Seattle? Find the top rated trails in Seattle, whether you're looking an easy walking path or a long bike trail, you'll find what you're looking for. Click on a trail below to find trail descriptions, trail maps, photos, and reviews ...

[Seattle , WA Bike Trails - Maps of Bike Routes in Seattle , WA](#)

www.mapmyride.com/us/seattle-wa

Find over 26366 bike trails in Seattle . Cycling routes, maps, events, races, & club rides in Seattle , WA. Track & analyze your rides with MapMyRIDE!

[WSDOT - Maps of Local Bicycle Paths and Accessible Trails](#)

<https://www.wsdot.wa.gov/bike/localmaps.htm>

Bing Custom Search

Identify

Utilize past search history to pinpoint on-topic or relevant sites and images

Provide

Expand the scope of search domains to define automatic query and search suggestions

Apply

Use Bing rankings to help users achieve the best automated results

Deliver

Add intelligent query suggestions and adjust search parameters to deliver relevant results and access unique usage insights

Custom Config

All

new movies



New Movies in Theaters | Moviefone

<https://www.moviefone.com/new-movie-releases>

Movie, TV, and pop culture fun for the whole family.

New Movies, Movie Trailers, TV, Digital, Blu-ray & Video ...

www.comingsoon.net

Check out the latest new movies coming soon to theaters & video games to come to market. Read latest buzz & watch exclusive trailers!

Snagfilms on the App Store - itunes.apple.com

<https://itunes.apple.com/us/app/snagfilms/id404906625>

Watch FREE FULL-LENGTH Movies and TV Shows streamed to your iPhone or iPad ! Over 5,000 independent movies, TV shows and documentaries. Over a dozen categories from adrenaline-filled action-adventure films to hilarious comedy and critically acclaimed documentaries.

Free Movies - Apps on Google Play

<https://play.google.com/store/apps/details?id=freemoviesapp.com>

Free Movies application connects you do a database of over 5,000 movies you can watch on your Android smartphone / tablet computer for free ... New ...

Get Movies & TV - Microsoft Store

<https://www.microsoft.com/en-us/store/p/movies-tv/9wzdncrfj3p2>

Download this app from Microsoft Store for Windows 10, Windows 8.1, Windows 10 Mobile, Windows Phone 8.1, Windows Phone 8, HoloLens, Xbox One. See screenshots, read the latest customer reviews, and compare ratings for Movies & TV.

Market

en-us (English-United States)

SafeSearch

Strict

Bing Video Search

Search results provide useful metadata including creator, encoding format, video length, view count, video description, and simplified paging

Video



Publish Date
"2016-09-20T20:09:26",

Description
"Cats are awesome, and super funny too! Who doesn't like cats and kittens? They make us laugh and happy!"

Content Creator
"Tiger Productions"

Publisher
"YouTube"

Market

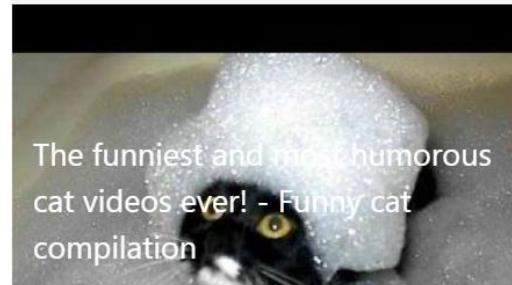
en-us (English-United States)

SafeSearch

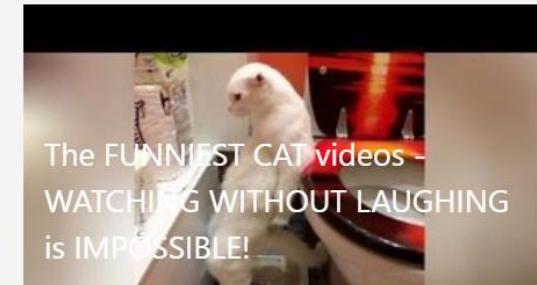
Strict

Freshness

(unspecified)



The funniest and most humorous
cat videos ever! - Funny cat
compilation



The FUNNIEST CAT videos -
WATCHING WITHOUT LAUGHING
is IMPOSSIBLE!



NINJA CATS! There's absolutely
NOTHING MORE FUNNY! -
Impossible TRY NOT TO LAUGH
compilation



CRAZY CATS vs PAPER, get ready
for SUPER LAUGHING! - Funny
CAT VIDEOS



Are ORANGE CATS the FUNNIEST
CATS? - Super FUNNY
COMPILATION that will make you
DIE LAUGHING

Bing Image Search

Discover new sorting and filtering options that simplify specific results and include thumbnails, full image URLs, publishing info, and image metadata

**Name**

"Desktop HD Wallpapers: 3D Nature Wallpapers",

Date Published

"2012-12-03T12:00:00",

Content Size

"595588 B",

Width 1600,

Height 914,

nature wallpapers

**Market**

en-us (English-United States)

SafeSearch

Strict

Freshness

(unspecified)

Bing Visual Search

Enhance

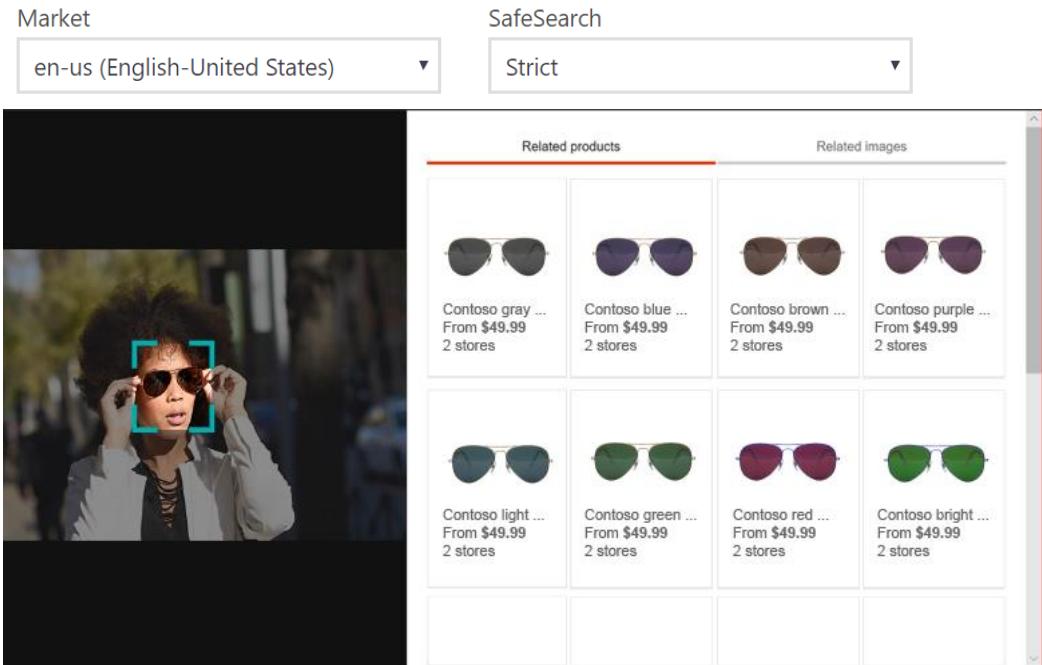
Create compelling recommendations using visually similar images

Add

Integrate any image source to get intelligent search annotations and information

Augment

Extract textual information and read text in images for improved search results

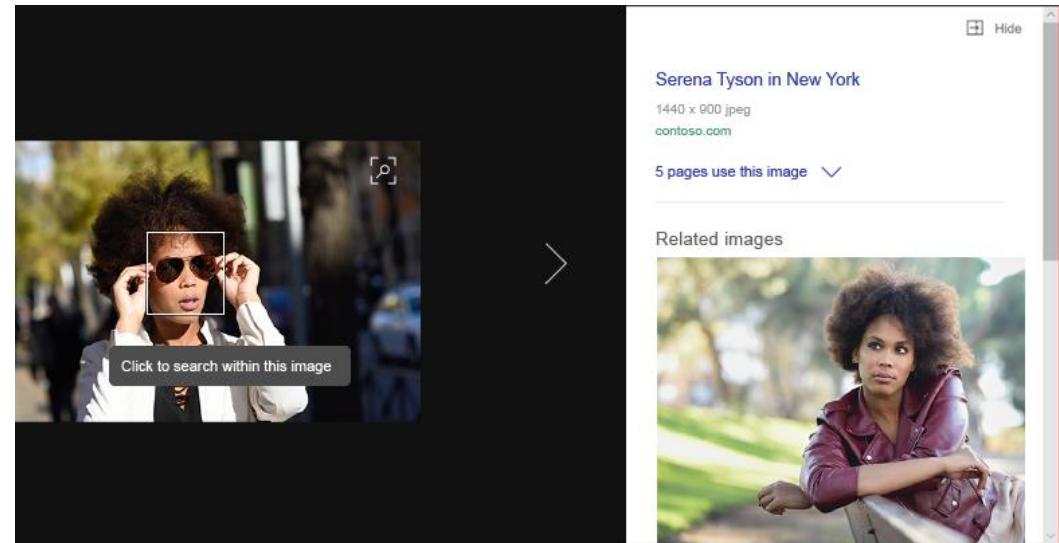


The screenshot shows the Bing Visual Search interface. At the top, there are dropdown menus for 'Market' set to 'en-us (English-United States)' and 'SafeSearch' set to 'Strict'. Below the interface is a large image of a person wearing sunglasses. A blue bounding box highlights the sunglasses area. To the right of the image, there are two tabs: 'Related products' (which is selected) and 'Related images'. Under 'Related products', there are four items listed:

Product Name	Price Range	Stores
Contoso gray ...	From \$49.99	2 stores
Contoso blue ...	From \$49.99	2 stores
Contoso brown ...	From \$49.99	2 stores
Contoso purple ...	From \$49.99	2 stores

Below these are four more items under 'Related images':

Image Type	Product Name	Price Range	Stores
Sunglasses	Contoso light ...	From \$49.99	2 stores
Sunglasses	Contoso green ...	From \$49.99	2 stores
Sunglasses	Contoso red ...	From \$49.99	2 stores
Sunglasses	Contoso bright ...	From \$49.99	2 stores



The screenshot shows the Bing Visual Search interface with a large image of a person wearing sunglasses. A white bounding box highlights the sunglasses area. Below the image, there is a button labeled 'Click to search within this image'. To the right of the image, there is a sidebar with the following information:

- Image details:
 - Image ID: Serena Tyson in New York
 - Size: 1440 x 900 jpeg
 - Source: contoso.com
- Usage: 5 pages use this image
- Related images: A smaller image of the same person in a different pose.

Bing Entity Search

Identify

Detect the most relevant entity based on searched terms

Augment

Improve the user experience and provide primary details about searched entities

Showcase

Present local or relevant businesses and locations for a more engaging experience

Query
Coffee 98004
Search Type
Restaurant
Address Locality
Bellevue
Address Region
WA
Postal Code
98004

The screenshot shows a search bar at the top with the query "Coffee 98004". Below the search bar, there are three search results listed:

- Third Culture Coffee**
<https://thirdculturecoffee.com/>
Bellevue, WA, 98004;
(425) 230-3660
Categories: Place, LocalBusiness, Restaurant
[See more on Bing >](#)
- Honor Coffee**
<http://www.honorcoffee.com/>
Bellevue, WA, 98004;
(425) 598-2185
Categories: Place, LocalBusiness, Restaurant
[See more on Bing >](#)
- Starbucks**
<http://www.starbucks.com/>
Bellevue, WA, 98004;
(425) 637-6513
Categories: Place, LocalBusiness, Restaurant
[See more on Bing >](#)

On the right side of the interface, there are several optional parameters set:

- Market: en-us (English-United States)
- Optional parameters: (empty)
- Latitude: 37.77
- Longitude: -122.4194
- Radius (meters): 5000

Bing News Search

Results include rich detail like authoritative image of articles, provider info, article URL, and date published

Return results can be customized to the location or market of the user

Simplify findings with sorting and filtering options for trending news and other topics

science updates 

Market: en-us (English-United States) ▾

SafeSearch: Strict ▾

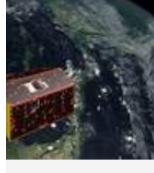
Freshness: (unspecified) ▾



[CHSE Odisha +2 Science result declared; 76.98% students pass the exam](#)
School and mass education minister Badri Narayan Patra releasing plus two science results at council of higher secondary education here on Saturday. Live updates 96,185 students have enrolled for the Plus Two examination 95096 studetns have appeared and ...



[Elon Musk updates the public on Boring Company and it's amazing](#)
Los Angeles - The hottest ticket in Los Angeles Thursday night was not a movie premiere - It was a seat in a synagogue to hear a tech CEO update people on a venture literally called the Boring Company. About 750 people were lucky enough to get a seat at ...



[Update: Launch coverage of Earth-observing satellites](#)
Briefing participants will be: David Jarrett, GRACE-FO program executive in the Earth Science Division at NASA Headquarters Frank Webb, GRACE-FO project scientist at NASA's Jet Propulsion Laboratory Frank Flechtner, GRACE-FO project manager at GFZ Phil ...



[NASA program to track greenhouse gas is canceled \(Update\)](#)
The end of the program—called the Carbon Monitoring System (CMS)—which tracked sources and sinks for carbon and made high-resolution models of the planet's flows of carbon —was first reported by the journal Science. "Now, President Donald Trump's ...



[APS Celebrates Science of Light with Art](#)
In honor of the role of light in science, culture, and life itself, the United Nations Education, Science and Culture Organization (UNESCO) has declared 2015 the International Year of Light and Light-based Technologies.

Bing Autosuggest

Populate

Use drop-down lists to suggest queries based on past search history

Narrow

Return detailed contextual suggestions to quickly find preferred search items

Discover

Find, troubleshoot, and diagnose problems quickly

A screenshot of a search interface. In the top left is a search bar containing the partial query "seatt". To the right of the search bar is a magnifying glass icon. Below the search bar is a list of suggested search terms, each in blue text: "seattle", "seattle mariners", "seattle times", "seattle seahawks", "seattle weather", "seattle airport", "seattlepi", and "seattle craigslist".



Leverage these services that enable informed and efficient decision-making

Content Moderator | Anomaly Detector | Personalizer



Decision

Content Moderator

Machine-assisted moderation of text and images, augmented with human review tools

Image moderation

Machine-learning based classifiers, custom blacklists, and Optical Character Recognition (OCR)

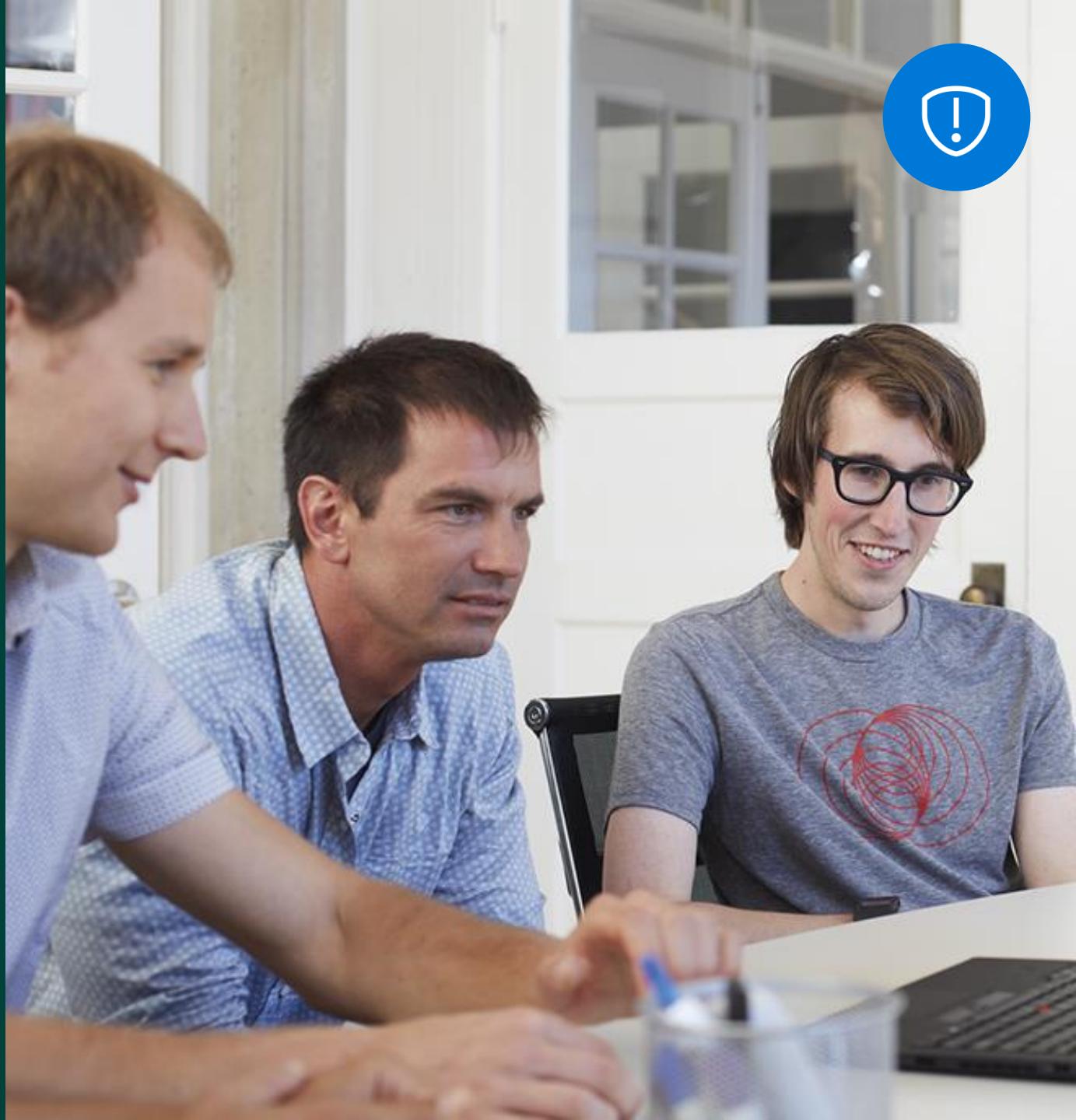
Text moderation

Helps you detect potential profanity in more than 100 languages and match text against your custom lists automatically.

Identification of possible Personally Identifiable Information (PII)

Video moderation (in Azure Media Services)

Scoring of possible adult content in videos.
Video moderation is currently deployed in preview on Azure Media Services



Anomaly Detector

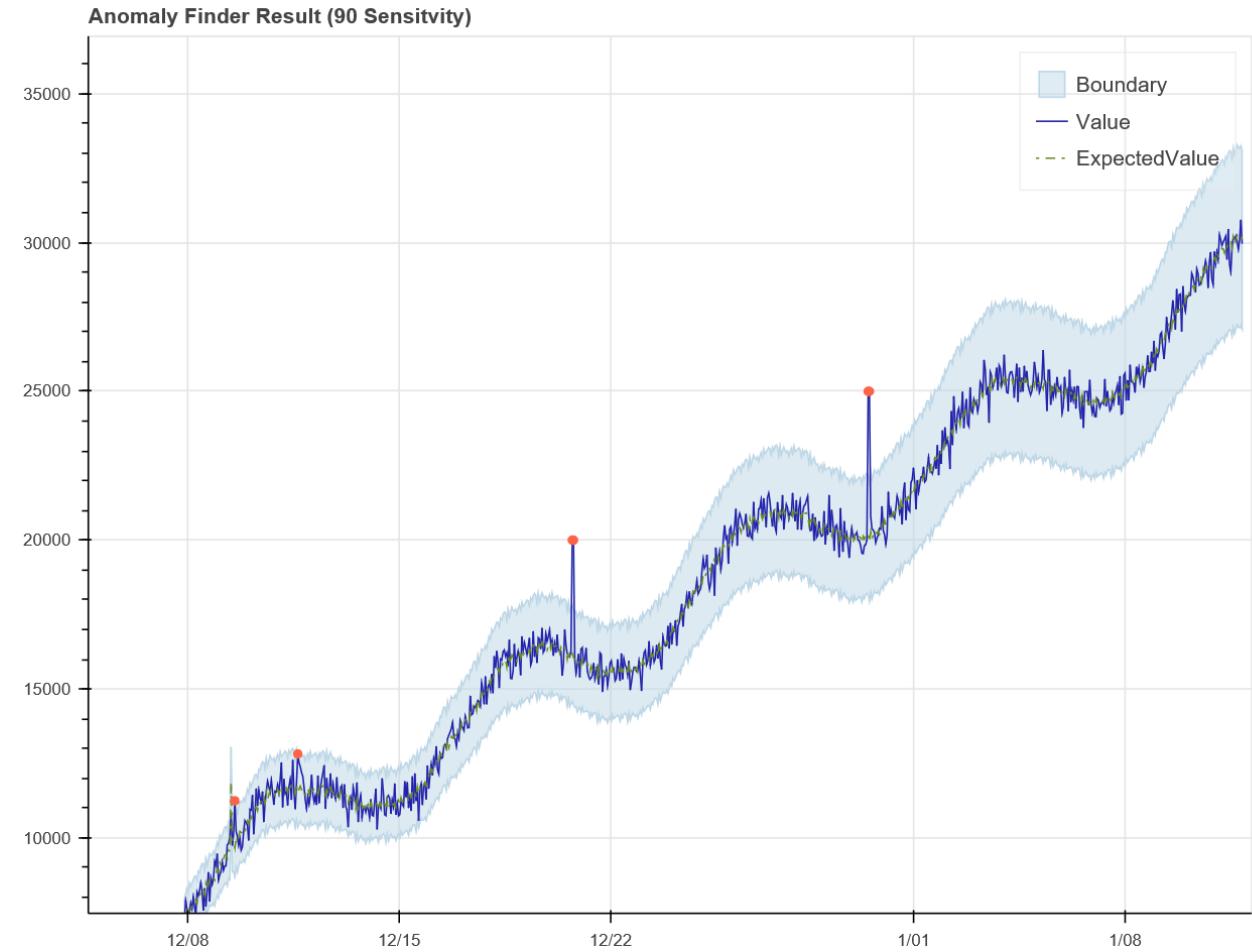
An AI service that helps you foresee problems before they occur ([preview](#)):

Powerful inference engine looks at your time-series data set and automatically selects the right algorithm to maximize accuracy for your scenario.

Automatic detection eliminates the need for labeled training data. Save time and stay focused on fixing problems as soon as they surface.

Customizable settings let you fine-tune sensitivity to potential anomalies based on your business's risk profile.

<https://azure.microsoft.com/en-us/services/cognitive-services/anomaly-detector/>



Personalizer

An AI service that delivers a personalized user experience (**preview**):

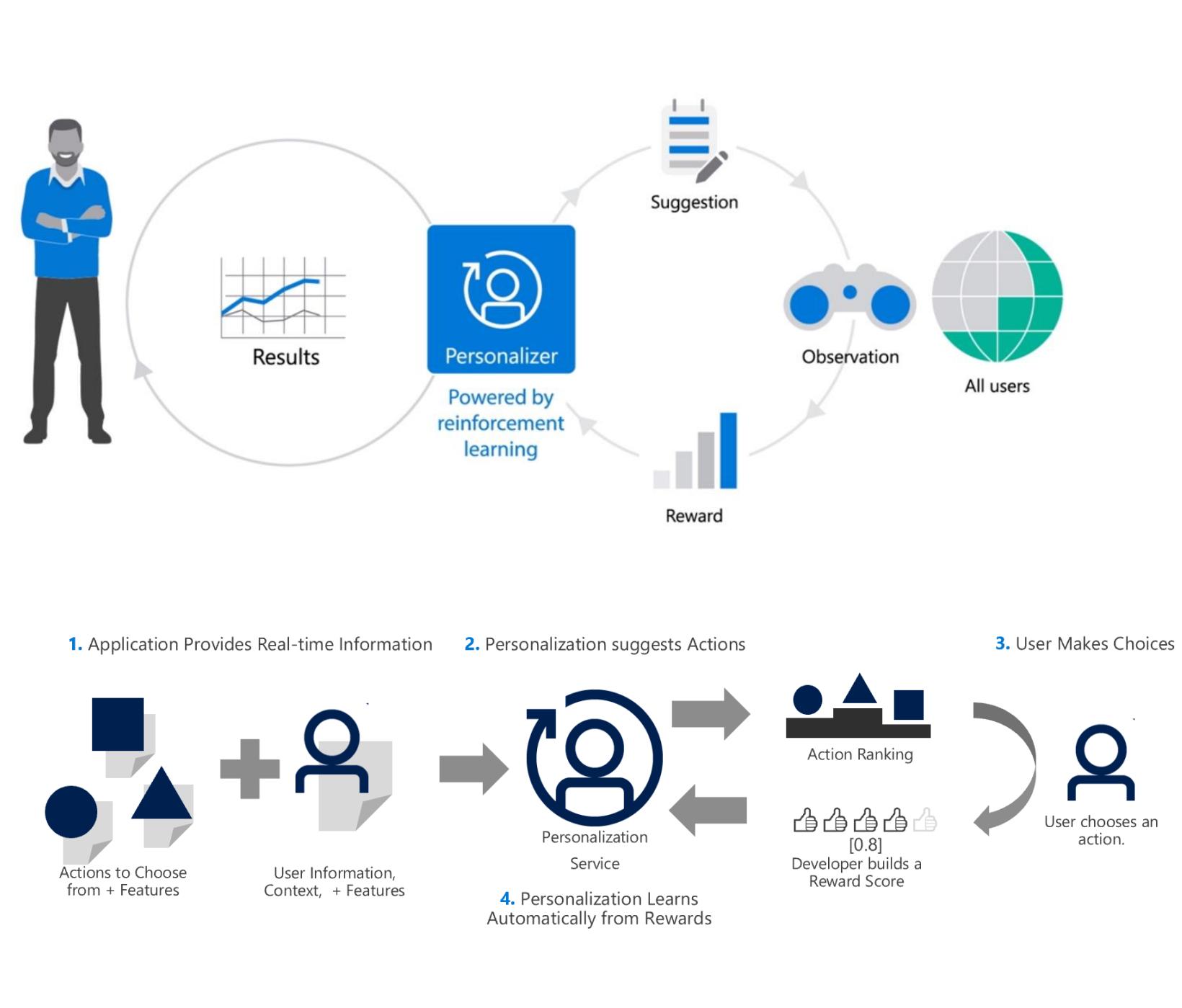
Personalized experiences in your apps

No machine-learning expertise required

Available on-premises or in Azure

User-friendly interface to easily manage the reinforcement-learning loop

<https://azure.microsoft.com/en-gb/services/cognitive-services/personalizer/>





Cognitive services Containers on premises

- Azure Cognitive Services provides several Docker containers that let you use the same APIs that are available in Azure, on-premises.
- Using these containers gives you the flexibility to bring Cognitive Services closer to your data for compliance, security or other operational reasons.
- Container support is currently available for a subset of Azure Cognitive Services, including parts of:
 - Anomaly Detector
 - Read OCR (Optical Character Recognition)
 - Spatial analysis
 - Face
 - Form Recognizer
 - Language Understanding (LUIS)
 - Speech Service API
 - Text Analytics
- [Use Azure Cognitive Services Containers on-premises - Azure Cognitive Services | Microsoft Docs](#)

Azure ML updates

Custom vision with Azure ML



Some new features are available with Azure ML for Computer vision:

- 1. Azure Data Labelling**
- 2. Custom vision modules with Azure ML Designer**

These new features can be used from Azure ML in a no code approach as well.



Azure Machine Learning

(i) New feature: To make labeling faster, we've added a new feature to train an ML model while you label. This feature currently supports image classification projects with Enterprise SKU. [Learn more about ML assisted labeling](#)

Project details

Project name *

Labeling task type *



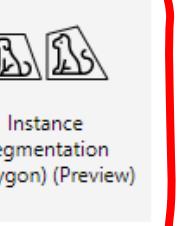
Image Classification Multi-class



Image Classification Multi-label



Object Identification (Bounding Box)



Instance Segmentation (Polygon) (Preview)

Apply only a single class from a set of classes to an image

[Learn more](#)

- **Azure Machine Learning data labeling** gives you a central place to create, manage, and monitor labeling projects.
- Use it to coordinate data, labels, and team members to efficiently manage labeling tasks. Machine Learning supports image classification, either multi-label or multi-class, object identification with bounded boxes & polygons.
- Data labeling tracks progress and maintains the queue of incomplete labeling tasks.
- You are able to start and stop the project and control the labeling progress. You can review the labeled data and export labeled in COCO format or as an Azure Machine Learning dataset.

Azure Data Labeling

<https://docs.microsoft.com/en-us/azure/machine-learning/how-to-create-labeling-projects>



Microsoft Azure Machine Learning

azuremlvision > Data Labeling > MaskDetection > Label

MaskDetection

Instructions Tasks

100%

Tags

Search tags

1 Mask

2 No_Mask

Submit

The screenshot shows the Microsoft Azure Machine Learning Data Labeling interface. On the left, a sidebar lists various ML components like Notebooks, Automated ML, Designer, Datasets, Experiments, Pipelines, Models, and Endpoints. The 'Data Labeling' section is currently selected. The main area displays a photograph of a woman wearing a blue surgical mask. A red dashed rectangular box highlights the area around her face, with the word 'Mask' written inside. In the bottom-left corner of the image, there is a small red icon. On the right side, there's a 'Tags' panel with two entries: '1 Mask' and '2 No_Mask'. At the bottom left, a blue 'Submit' button is visible.

Azure Data Labeling

<https://docs.microsoft.com/en-us/azure/machine-learning/how-to-create-labeling-projects>



- New
- Home
- Author
- Notebooks
- Automated ML
- Designer
- Assets
- Datasets
- Experiments
- Pipelines
- Models
- Endpoints
- Manage
- Compute
- Datastores
- Data Labeling

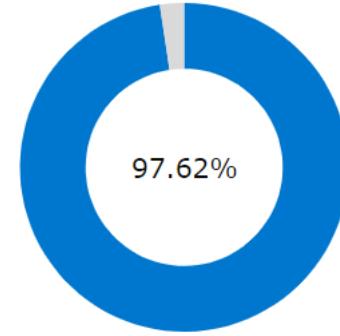
MaskDetection

Export Label data Refresh

Dashboard Data Details

Progress

164 / 168 items labeled



Task queue

Manual

4

Prelabeled

0

Experiments

Training

[labeling_Training_1ab6af6a](#)

Validation

[labeling_Validation_1ab6af6a](#)

Inference

Experiment not started

Label class distribution

No_Mask 119/229 (51.97%) **Mask** 110/229 (48.03%)

Labeler performance

Serge Retkowsky 164

Azure Data Labeling

<https://docs.microsoft.com/en-us/azure/machine-learning/how-to-create-labeling-projects>

Azure Machine Learning

Search by name, tags and description

99 assets in total

Autosave on

Not started

Image Classification using DenseNet

```
graph TD; A[Animal Images Dataset] --> B[Convert to Image Directory]; B --> C[Split Image Directory]; C --> D[DenseNet]; D --> E[Apply Image Transformation]; E --> F[Apply Image Transformation]; F --> G[Apply Image Transformation]; G --> H[Train PyTorch Model]; C --> I[Split Image Directory]; I --> J[Apply Image Transformation]; J --> K[Apply Image Transformation]; K --> L[Apply Image Transformation]; L --> H;
```

Submit Publish

Computer Vision (6)

Image Data Transformation (4)

④ Apply Image Transformation Microsoft Applies a image transformation to a image directory. 9/17/2020

④ Convert to Image Directory Microsoft Convert dataset to image directory format. 9/17/2020

④ Init Image Transformation Microsoft Initialize image transformation. 9/17/2020

Navigator

Computer Vision with Azure ML Designer



- ④ Apply Image Transformation
Microsoft
Applies a image transformation to a image directory.
9/17/2020
- ④ Convert to Image Directory
Microsoft
Convert dataset to image directory format.
9/17/2020
- ④ Init Image Transformation
Microsoft
Initialize image transformation.
9/17/2020
- ④ Split Image Directory
Microsoft
Partitions the images of a image directory into two distinct sets.
9/17/2020

Image Classification (2)

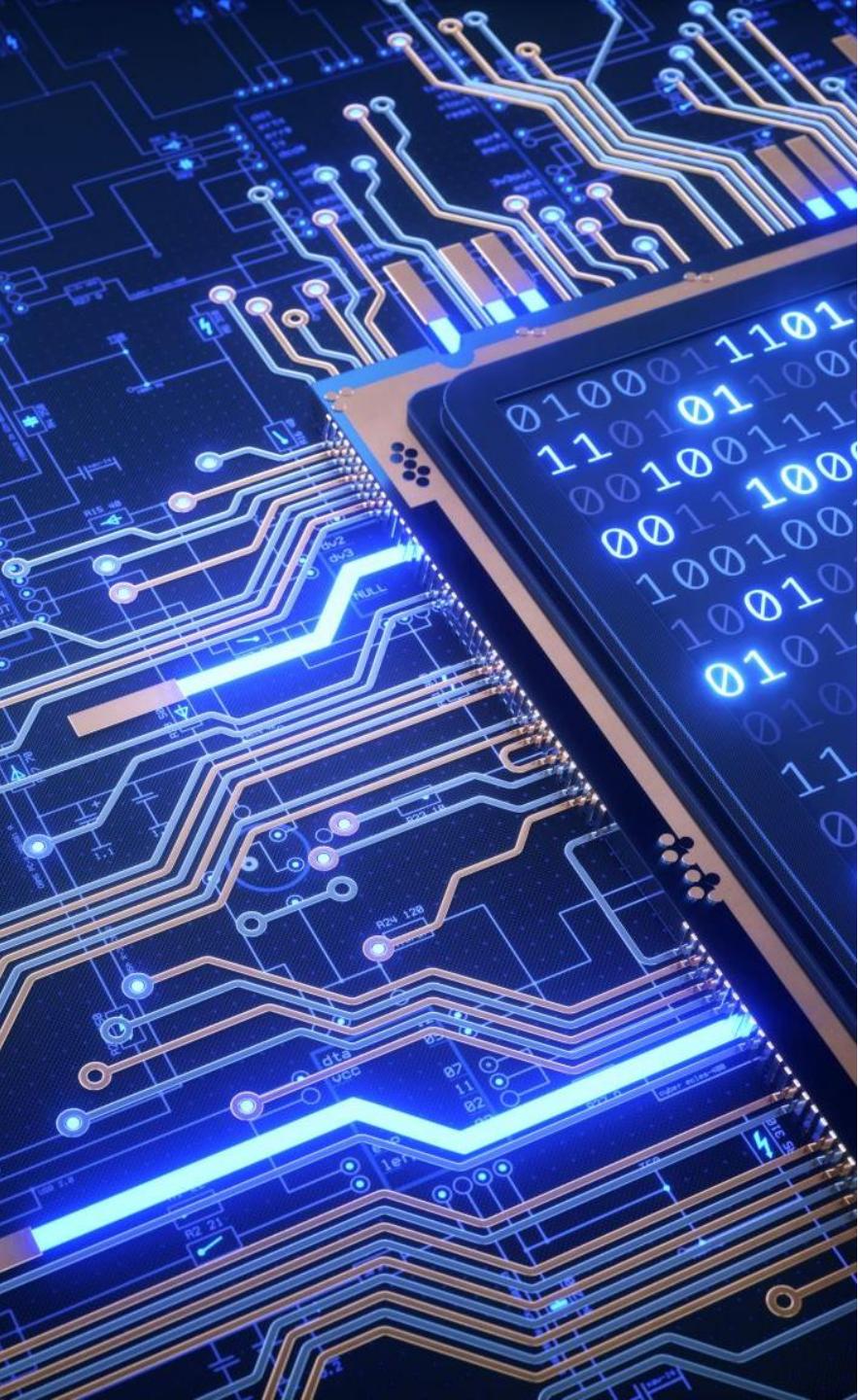
- ④ DenseNet
Microsoft
Creates a image classification model using the densenet algorithm.
9/17/2020
- ④ ResNet
Microsoft
Creates a image classification model using the resnet algorithm.
9/17/2020

Computer Vision with Azure ML Designer Documentation:

- <https://docs.microsoft.com/en-us/azure/machine-learning/algorith-module-reference/apply-image-transformation>
- <https://docs.microsoft.com/en-us/azure/machine-learning/algorith-module-reference/convert-to-image-directory>
- <https://docs.microsoft.com/en-us/azure/machine-learning/algorith-module-reference/init-image-transformation>
- <https://docs.microsoft.com/en-us/azure/machine-learning/algorith-module-reference/split-image-directory>
- <https://docs.microsoft.com/en-us/azure/machine-learning/algorith-module-reference/densenet>
- <https://docs.microsoft.com/en-us/azure/machine-learning/algorith-module-reference/resnet>

Computer Vision with Azure ML Designer





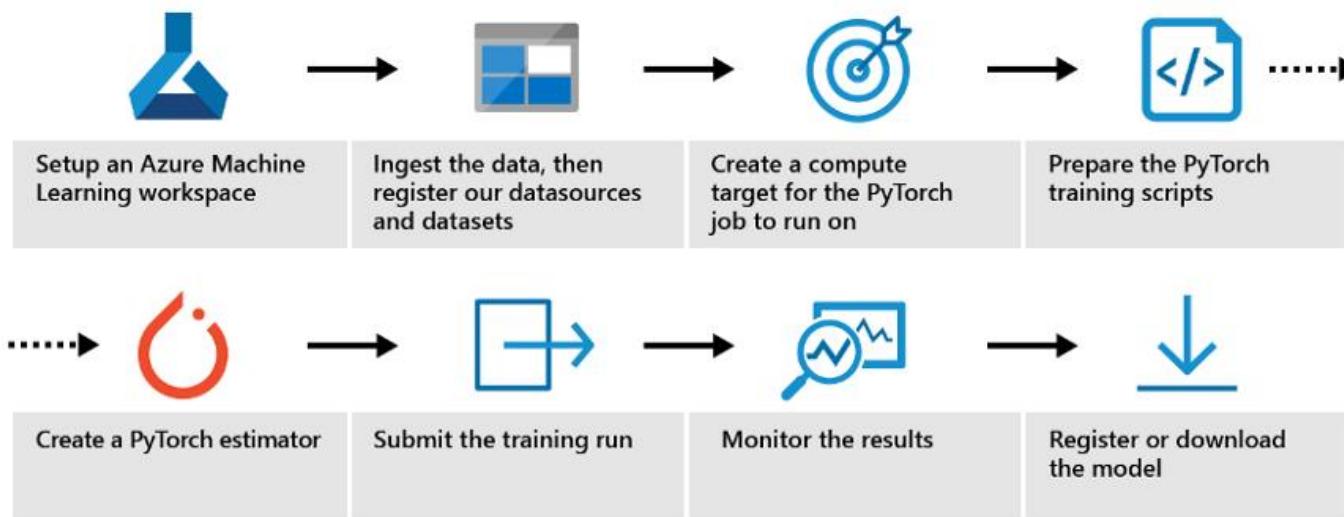
Azure Announces Public Availability of ND A100 v4 AI Supercomputing Instances (Preview)

Today, at SC20, we're [announcing the public preview of the ND A100 v4 VM](#) family, available from one virtual machine [to world-class supercomputer scale](#), with each individual VM featuring:

- Eight of the latest NVIDIA A100 Tensor Core GPUs with 40 GB of HBM2 memory, offering a typical per-GPU performance improvement of 1.7x – 3.2x compared to V100 GPUs- or up to 20x by layering features like new mixed-precision modes, sparsity, and MIG- for significantly lower total cost of training with improved time-to-solution
- VM system-level GPU interconnected based on NVLINK 3.0 + NVswitch
- One 200 Gigabit InfiniBand HDR link [per GPU](#) with full NCCL2 support and GPUDirect RDMA for 1.6 Tb/s per virtual machine
- 40 Gb/s front-end Azure networking
- 6.4 TB of local NVMe storage
- InfiniBand-connected job sizes in the thousands of GPUs, featuring any-to-any and all-to-all communication without requiring topology aware scheduling
- 96 physical AMD Rome vCPU cores with 900 GB of DDR4 RAM
- PCIe Gen 4 for the fastest possible connections between GPU, network and host CPUs- up to twice the I/O performance of PCIe Gen 3-based platforms

[Azure Announces Public Availability of ND A100 v4 AI Supercomputing Instances \(Preview\) - Microsoft Tech Community](#)

Partnership with PyTorch



- We continue to grow our partnership with PyTorch.
- AstraZeneca, the UK-based biopharmaceutical company, is using PyTorch's natural language processing library for knowledge graphs and Azure Machine Learning to build models to recommend potential new drugs.
[Speeding up drug discovery with advanced machine learning | by PyTorch | PyTorch | Medium](#)

Azure ML & Azure Synapse

The screenshot shows the Azure Synapse Analytics workspace. On the left, there's a sidebar with navigation links like 'Linked', 'tables', 'resources', 'mability', 'SQL (SQL)', 'QL', 'L', 'IDB (SQL)', 'Q', 'ily_detector_testing_d...', 'im_text_analytics', 'E', and 'training_data'. The main area has a header 'wsazuresynapseanalytics' with a search bar and user info 'negust@microsoft.com MICROSOFT'. Below the header, there are tabs for '05 Sentiment_Analys...' (selected), '05 Anomaly_Detectio...', and 'Notebook 3'. A toolbar with 'Validate all', 'Publish all', and other options is at the top. The notebook content shows code in Cell 1 and Cell 2. Cell 1 contains a check for mmlspark version. Cell 2 contains code for sentiment analysis using mmlspark and pyspark. A modal window titled 'Enrich with new model' is open, showing 'nyc_taxi' as the dataset. It asks to 'Choose a model type' and lists three options: 'Classification' (with a bar chart icon), 'Regression' (with a stack of bars icon), and 'Time series forecasting' (with a line graph icon). Each option has a brief description and an example.

[Machine Learning Experiences
in Azure Synapse | AI Show |
Channel 9 \(msdn.com\)](#)



Resources





QnA Bot Explorer



Content Search & Intelligence



Stack Overflow Bot



Chart Reader



Custom Vision Explorer



Image Collection Insights



Bing Visual Search



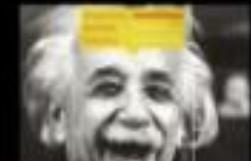
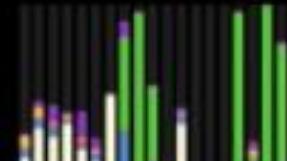
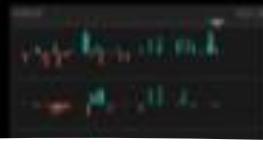
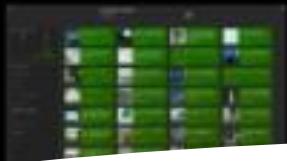
Vision API Explorer



Greeting Kiosk



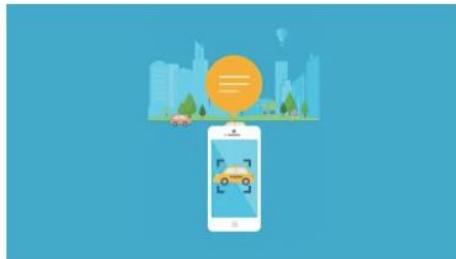
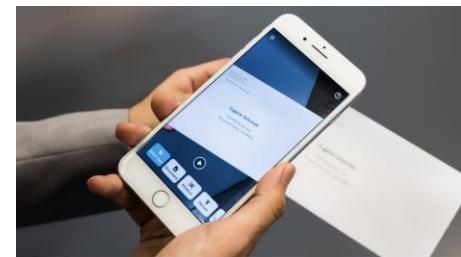
Realtime Driver Monitoring



Intelligent Kiosk

- Installation Instructions:
<http://aka.ms/intelligentkiosk>
- Direct download:
<http://aka.ms/kioskapp>
- Kiosk sample on GitHub:
<https://github.com/Microsoft/Cognitive-Samples-IntelligentKiosk/>

Seeing AI app from Microsoft for iOS



Introducing Seeing AI

Hear a brief overview of the Seeing AI app.

[▷ Play video about Seeing AI app](#)

Short Text Demo

Learn how to instantly hear short snippets of text.

[▷ Play video about Short Text](#)

Document Demo

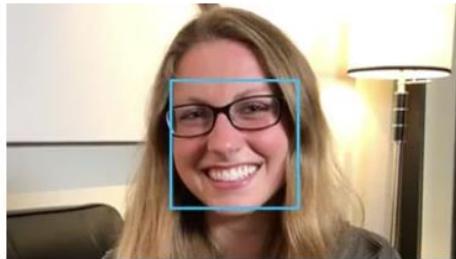
A guide on how to make the most of the Document channel.

[▷ Play Document channel video](#)

Product Recognition Demo

Listen to audio cues to locate barcodes and identify products.

[▷ Play Product channel video](#)



Person Demo

Learn how to use Seeing AI to engage with people around you.

[▷ Play Person channel video](#)

Scene Demo

Learn more about this experimental channel that describes what's in front of you.

[▷ Play Scene channel video](#)

Currency Demo

A guide for using the app to read currency bills.

[▷ Play Currency channel video](#)

Recognize Images In Other Apps

Describe images in your photo gallery and other apps including Mail, Twitter, WhatsApp and more.

[▷ Play video to learn about this feature](#)

[Seeing AI App from Microsoft](#)

Azure Cognitive Services documentation

<https://azure.microsoft.com/en-us/services/cognitive-services/>

- Documentation:

<https://docs.microsoft.com/en-us/azure/cognitive-services/>

- Samples notebooks:

<https://github.com/retkowsky/AzureCognitiveServicesPython>

[retkowsky/ai-fundamentals: Code samples for AI fundamentals \(github.com\)](https://github.com/retkowsky/ai-fundamentals)



Custom Vision

- Azure Custom Vision.ai :
<https://www.customvision.ai>
- Documentation:
<https://docs.microsoft.com/en-us/azure/cognitive-services/Custom-Vision-Service>
- Custom Vision Training API:
<https://southcentralus.dev.cognitive.microsoft.com/docs/services/Custom%20Vision%20Training%203.3/operations/5eb0bcc6548b571998fddebd>
- Custom Vision Prediction API:
<https://southcentralus.dev.cognitive.microsoft.com/docs/services/Custom%20Vision%20Prediction%203.1/operations/5eb37d24548b571998fde5f3>
- AI Dev Kit:
<https://visionaidevkit.com>

Labs



Create a Cognitive Services Resource

Create a Cognitive Services Resource

1. Let's start by creating a **Cognitive Services** resource in your Azure subscription:
2. In another browser tab, open the Azure portal at <https://portal.azure.com>, signing in with your Microsoft account.
3. Click the **+Create a resource** button, search for **Cognitive Services**, and create a **Cognitive Services** resource with the following settings:
 - **Name:** *Enter a unique name.*
 - **Subscription:** *Your Azure subscription.*
 - **Location:** *Choose any available region:*
 - **Pricing tier:** S0
 - **Resource group:** *Create a resource group with a unique name.*
4. Wait for deployment to complete. Then go to your cognitive services resource, and on the **Overview** page, click the link to manage the keys for the service. You will need the endpoint and keys to connect to your cognitive services resource from client applications.

Get the Key and Endpoint for your Cognitive Services resource

To use your cognitive services resource, client applications need its endpoint and authentication key:

In the Azure portal, on the **Keys and Endpoint** page for your cognitive service

Create a Cognitive Services Resource

Dashboard > New > Cognitive Services >

Create Cognitive Services

Basics Tags Review + create

Get access to Vision, Language, Search, and Speech Cognitive Services with a single API key. Quickly connect services together to achieve more insights into your content and easily integrate with other services like Azure Search. Learn more

Project details

Select the subscription to manage deployed resources and costs. Use resource groups like folders to organize and manage all your resources.

Subscription * 

Microsoft Azure Internal Consumption 

Resource group * 

(New) cogservs-rg 

[Create new](#)

Instance details

Region * 

West Europe 



Location specifies the region only for included regional services. This does not specify a region for included non-regional services. [Click here for more details.](#) 

Name * 

cognitiveserviceslab 

Pricing tier * 

Standard S0 

[View full pricing details](#)

I confirm I have read and understood the  notice below.

Microsoft will use data you send to Bing Search Services to improve Microsoft products and services. Where you send personal data to this service, you are responsible for obtaining sufficient consent from the data subjects. The Data Protection Terms in the Online Services Terms do not apply to Bing Search Services.

Please refer to online services terms for details.

[Online services terms](#)

[Review + create](#)

[< Previous](#)

[Next : Tags >](#)

Get the key & the endpoint

cognitiveserviceslab | Keys and Endpoint

Search (Ctrl+ /)

Overview

Activity log

Access control (IAM)

Tags

Diagnose and solve problems

RESOURCE MANAGEMENT

Quick start

Keys and Endpoint

Pricing tier

Networking

Identity

Billing By Subscription

Properties

Locks

Monitoring

Alerts

Metrics

Diagnostic settings

Logs

Automation

Tasks (preview)

Export template

Regenerate Key1

Regenerate Key2

These keys are used to access your Cognitive Service API. Do not share your keys. Store them securely—for example, using Azure Key Vault. We also recommend regenerating these keys regularly. Only one key is necessary to make an API call. When regenerating the first key, you can use the second key for continued access to the service.

Show Keys

KEY 1

KEY 2

Endpoint

https://cognitiveserviceslab.cognitiveservices.azure.com/

Location

westeurope

The screenshot shows the Azure Cognitive Services Keys and Endpoint page. The 'Keys and Endpoint' section is selected in the left sidebar. The 'Show Keys' button is visible. Two fields are highlighted with red boxes: 'KEY 1' and 'Endpoint'. The 'Endpoint' field contains the URL 'https://cognitiveserviceslab.cognitiveservices.azure.com/'.

Labs materials

Materials available here:

<https://github.com/retkowsky/Azure-CognitiveServices-Labs>

etkowsky Delete test		490050
images	Delete test	
python_code	Add files via upload	
speech	Add files via upload	
1 Image Analysis with Computer Visio...	Add files via upload	
2 Face Analysis.ipynb	Add files via upload	
3 OCR.ipynb	Add files via upload	
4 Text Analytics.ipynb	Add files via upload	
5 Translation.ipynb	Add files via upload	
6 Speech to Text.ipynb	Add files via upload	
7 Receipts with Form Recognizer.ipynb	Add files via upload	
README.md	Update README.md	

README.md

Azure-CognitiveServices-Labs

Azure Cognitive Services Labs

<https://azure.microsoft.com/fr-fr/services/cognitive-services/>



		Name	Last Modified	File size
0	..		seconds ago	
	images		a day ago	
	python_code		a day ago	
	speech		3 hours ago	
	1 Image Analysis with Computer Vision.ipynb	Running	14 minutes ago	1.95 MB
	2 Face Analysis.ipynb	Running	14 minutes ago	1.64 MB
	3 OCR.ipynb	Running	14 minutes ago	2.62 MB
	4 Text Analytics.ipynb	Running	14 minutes ago	15.9 kB
	5 Translation.ipynb	Running	13 minutes ago	13 kB
	6 Speech to Text.ipynb	Running	13 minutes ago	838 kB
	7 Receipts with Form Recognizer.ipynb	Running	13 minutes ago	75.5 kB

To import all the materials

1. Create an Azure ML Compute Instance
2. Open a terminal session
3. Then execute :

```
git clone https://github.com/retkowsky/Azure-CognitiveServices-Labs
```

Lab 1 Computer Vision

Notebook:
1 Image Analysis with Computer Vision

```
1 # Get the path to an image file
2 image_path = os.path.join('images', 'menatwork.jpg')
3
4 # Specify the features we want to analyze
5 features = ['Description', 'Tags', 'Adult', 'Age']
6
7 # Get an analysis from the computer vision service
8 image_stream = open(image_path, "rb")
9 analysis = computervision_client.analyze_image(
10    image_stream, features)
11
12 # Show the results of analysis (code in helpers.py)
13 vision.show_image_analysis(image_path, analysis)
```



Lab 2 Face Analysis

Notebook:
2 Face Analysis





Lab 3 OCR

Notebook:
3 OCR

F
AA . 725. AD
95

Out[10]: <matplotlib.image.AxesImage at 0x7f27a9259978>



Lab 4 Text Analytics

Notebook: 4 Text Analytics

```
In [27]: 1 from IPython.display import HTML
2 table = []
3 for document in languages["documents"]:
4     text = next(filter(lambda d: d["id"] == document["id"], documents["documents"]))["text"]
5     langs = ", ".join(["{}({})".format(lang["name"], lang["score"]) for lang in document["detectedLanguages"]])
6     table.append("<tr><td>{0}</td><td>{1}</td>".format(text, langs))
7 HTML("<table><tr><th>Text</th><th>Detected languages(scores)</th></tr>" + "\n".join(table))
```

Out[27]:

Text	Detected languages(scores)
This is a document written in English.	English(1.0)
Este es un document escrito en Español.	Spanish(1.0)
这是一个用中文写的文件	Chinese_Simplified(1.0)
Ceci est une présentation du service cognitif Azure Text Analytics.	French(1.0)
सुप्रभात। आप ठीक तो हैं न?	Hindi(1.0)

Lab 5 Translation

Notebook:
5 Translation

File Edit View Insert Cell Kernel Help

```
1 df['Italian'] =  
2 df
```

	English	Italian
0	Hello	Ciao
1	Today	Oggi
2	Goodbye	Arrivederci

another one

Lab 6 Speech to Text

Notebook:
6 Speech to Text

[4]:



```
1 import os
2 import IPython
3 from azure.cognitiveservices.speech import SpeechConfig
4
5 # Get spoken command from audio file
6 file_name = 'light-on.wav'
7 audio_file = os.path.join('speech', file_name)
8
9 # Configure speech recognizer
10 speech_config = SpeechConfig(cog_key, cog_region)
11 audio_config = AudioConfig(filename=audio_file) #
12 speech_recognizer = SpeechRecognizer(speech_config)
13
14 # Use a one-time, synchronous call to transcribe the audio
15 speech = speech_recognizer.recognize_once()
16
17 # Play audio and show transcribed text
18 IPython.display.display(IPython.display.Audio(audio_file))
19 IPython.display.HTML(speech.text)
```



0:02 / 0:02

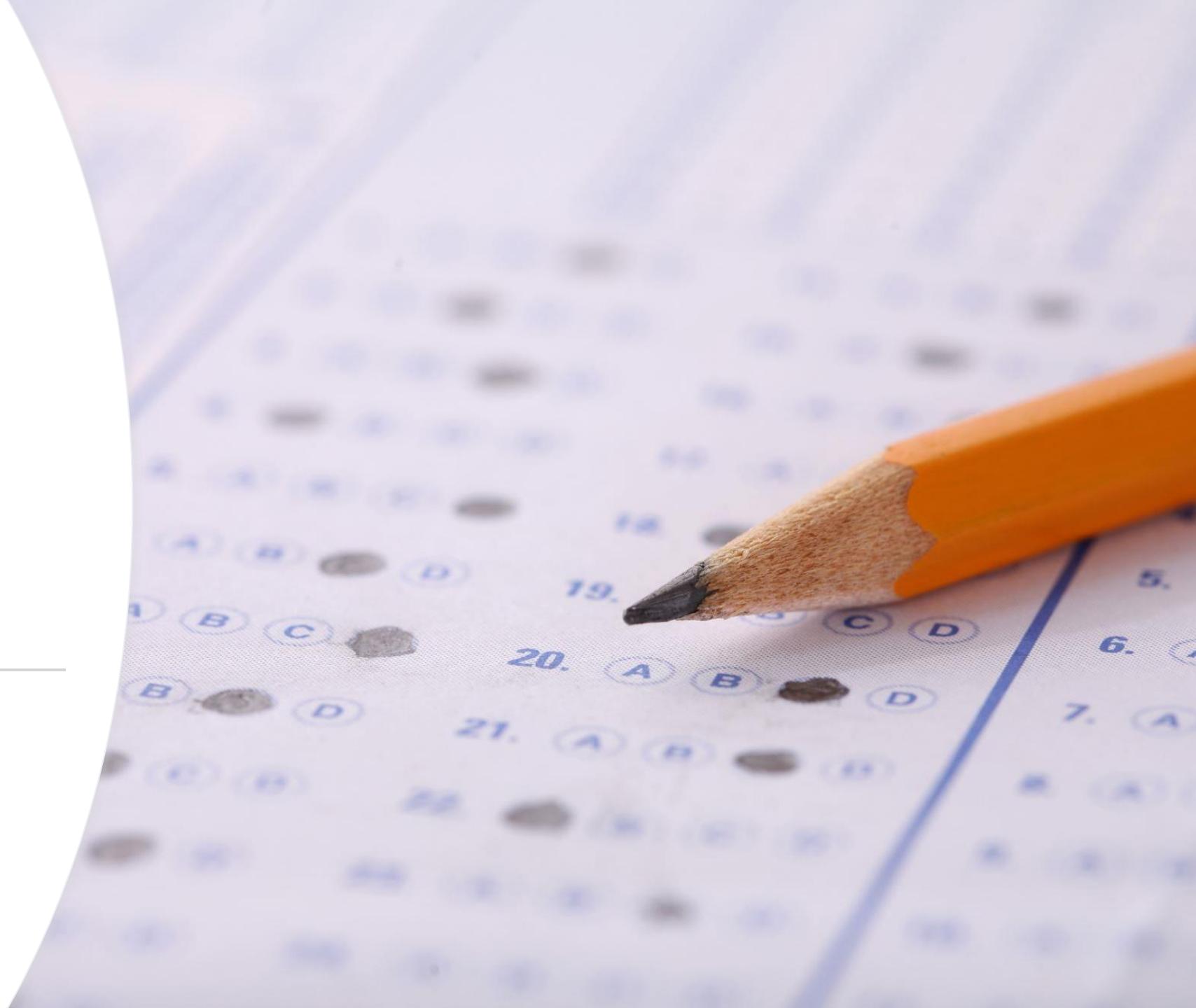


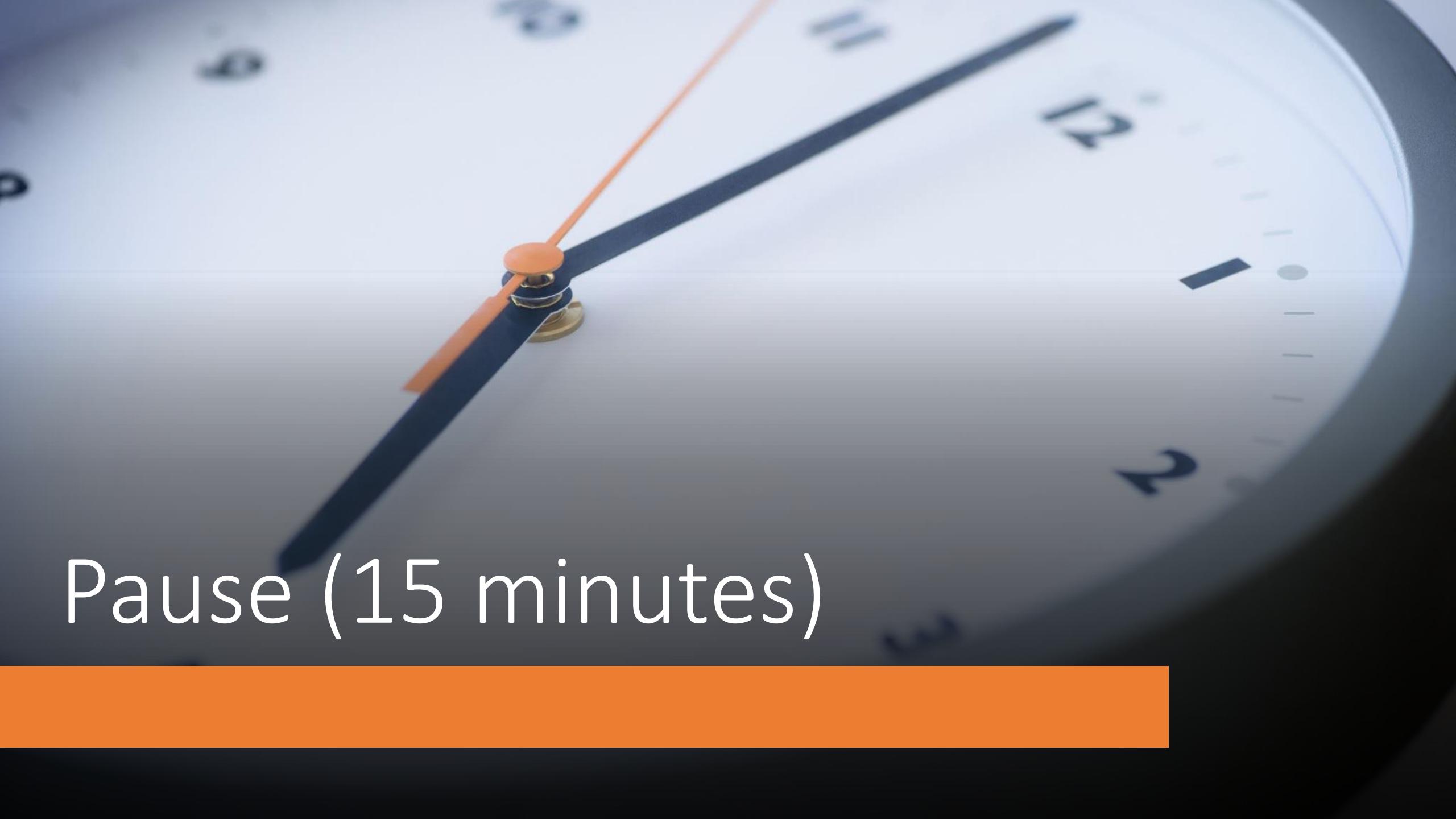
Lab 7 Receipts with Form Recognizer

Notebook:
7 Receipts with Form Recognizer

```
Analyzing receipt...
Receipt Type: Itemized
Merchant Address: 123 Main St
Merchant Phone: +15551234
Transaction Date: 2020-02-28
Receipt items:
  Item #1
    - Name: Apple
    - Price: 0.9
  Item #2
    - Name: Orange
    - Price: 0.8
total: 1.7
:: 0.17
Total: 1.87
```

Quiz time 2

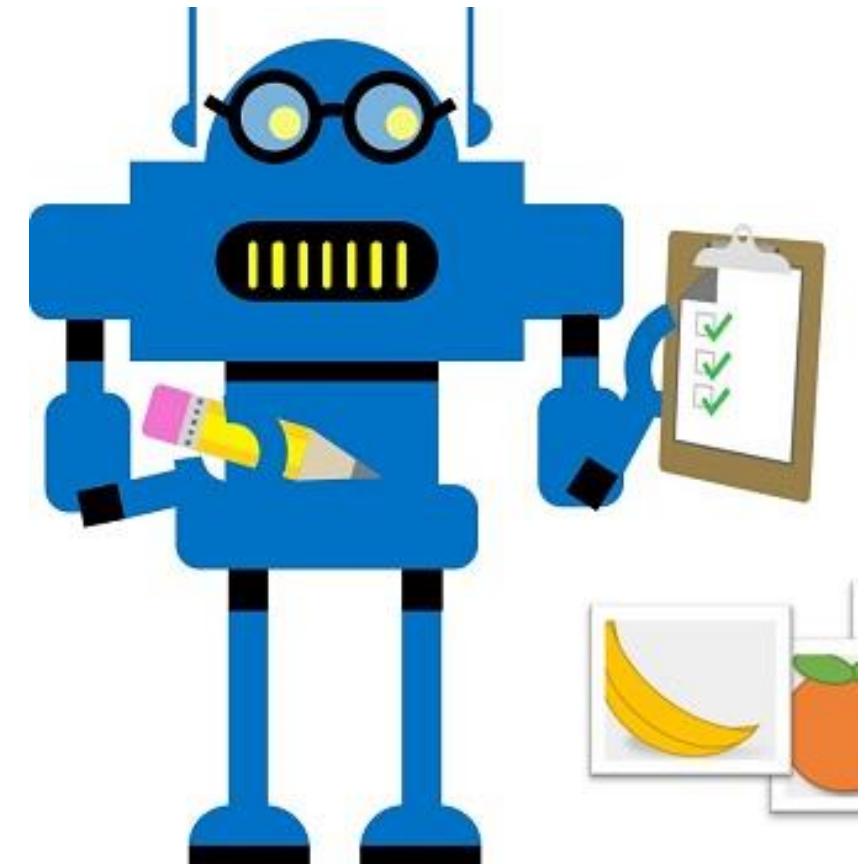




Pause (15 minutes)

Lab 8 Custom vision for image classification

1. Use <https://www.customvision.ai>
2. Create a classification project to identify bananas, oranges & apples
3. Use these images to build the project:
<https://aka.ms/fruit-images>
4. Build a custom vision model for image classification
5. Test the model using this sample image:
<https://aka.ms/apple-image>



Iterations Optimism Prediction score Delete Export

Probability Threshold: 50% ⓘ
Overlap Threshold: 30% ⓘ

Iteration 7 PUBLISHED

Trained : 1 days ago with General (compact) domain

Iteration 6

Trained : 1 days ago with General (compact) domain

Iteration 5

Advanced Trained : 1 days ago with General (compact) domain, Training Budget: 1 hour

Iteration 4

Trained : 1 days ago with General (compact) domain

Iteration 3

Trained : 1 days ago with General (compact) domain

Iteration 2

Iteration 7

Finished training on 20/04/2020 à 13:52:36 using General (compact) domain
Iteration id: 2f88d71e-0993-4677-a7ce-c5ec6bb3ad72
Published as: Iteration7

Precision ⓘ Recall ⓘ mAP ⓘ

Performance Per Tag

Tag	Precision	Recall	A.P.	Image count
No_Mask	87.0%	76.9%	78.8%	85
Mask	85.7%	54.5%	74.5%	83

Performance
of the model



Indicators definition

- **Precision** indicates the fraction of identified classifications that were correct. For example, if the model identified 100 images as "Mask", and 90 of them were actually of "Mask", then the precision would be 90%.
- **Recall** indicates the fraction of actual classifications that were correctly identified. For example, if there were actually 100 images of "Mask", and the model identified 85 as "Mask", the recall would be 85%.
- **mAP** is Mean Average Precision. Its use is different in the field of Information Retrieval Multi-Class classification (Object Detection) settings. To calculate it for Object Detection, you calculate the average precision for each class in your data based on your model predictions. Average precision is related to the area under the precision-recall curve for a class. Then Taking the mean of these average individual-class-precision gives you the Mean Average Precision.



Some guidance

Unbalanced data

- You might see this warning: *Unbalanced data detected. The distribution of images per tag should be uniform to ensure model performance.*
- The warning indicates that you don't have an even number of samples for each class of data. There are different ways to solve unbalanced data; one way is by using *Synthetic Minority Over-sampling Technique (SMOTE)*. SMOTE duplicates training examples from our existing training pool. In our model, we don't see this warning, but it's something to watch for in a machine learning model.

Overfitting

- If you don't have enough data or your data isn't diverse enough, your model can become overfitted. When a model is overfitted, it knows the dataset that is provided well, and it is overfitted to the patterns in that data. The model performs well on the training data, but it will perform poorly on new data that it hasn't seen before. This is why we always test our models by using new data!

Testing by using training data

- As in overfitting, if you test the model by using the same data that you trained the model with, the model will appear to perform well, but when you deploy the model to production, it most likely will do poorly.

Bad data

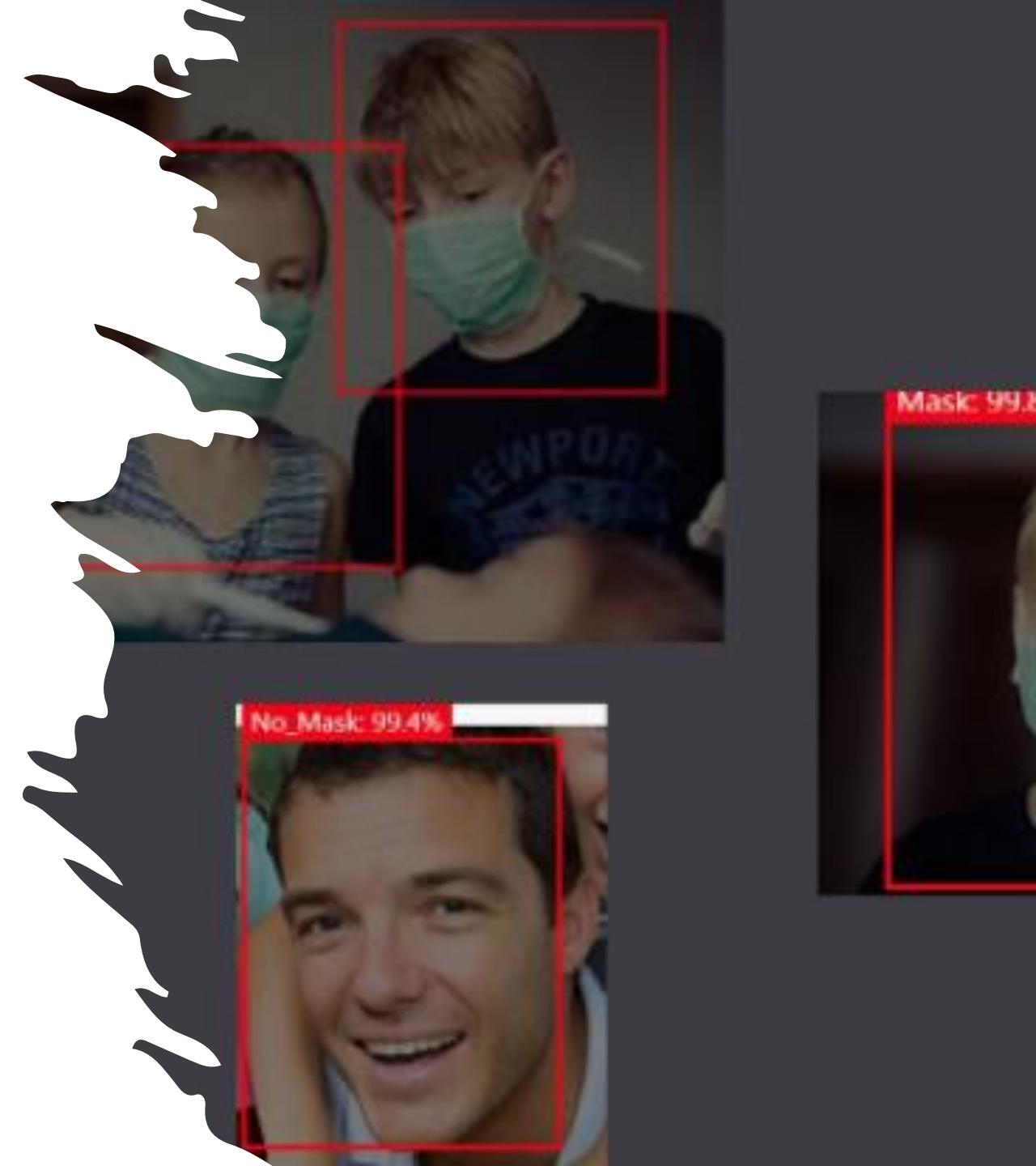
- Another common mistake is training by using bad data. There are ways that your data can actually hurt your model and accuracy. For example, data that is "noisy" can cause issues: too much information that isn't useful is provided, and the information causes model confusion. More data is better only if the data is good data. You might need to throw out bad data or features to improve your model accuracy.

Azure Custom Vision

- Azure Custom Vision is built on a **Resnet50** backbone. "Compact model" use **ShuffleNet**. Object detection use **YOLOv2**.
- **ImageNet** for classification and **COCO** for object detection are used for **Transfer Learning**.
- About the "**Advanced training**" option:
 - **Advanced training** does **fine tuning of up to last 3 blocks in Resnet** (not just simple transfer learning as in quick training mode - weights in the convolution layers are frozen in simple approach and training only impacts the weights in the last fully connected layers).
 - **Advanced training** does **tunning of hyperparameters**: Number of layers & loss function and learning rate update methods (adaptive or not).
 - **Advanced training** does **advanced data augmentation** using weighted policies. Augmentations used: *Combination of scale, rotate, equalize histogram, solarize, padding and cropping, based on research papers.*
 - **Advanced training** starts by running with and without horizontal flipping and then enable it or disable it for later training runs based on the initial performance. Different combinations of the augmentations will be explored if there's enough budget otherwise a heuristic is used.

Lab 9 Custom vision for object detection

1. Use <https://www.customvision.ai>
2. Create an **object detection** project to identify if people are wearing a mask or not.
3. Use these images to build the project:
<https://github.com/retkowsky/Azure-CognitiveServices-Labs/blob/main/images/Mask-Detection/Mask.zip>
4. Build a custom vision model for image classification
5. Test the model using these tests images:
<https://github.com/retkowsky/Azure-CognitiveServices-Labs/blob/main/images/Mask-Detection/test1.jpg>
<https://github.com/retkowsky/Azure-CognitiveServices-Labs/blob/main/images/Mask-Detection/test2.jpg>



Lab 9

Testing the custom vision deployed model with PostMan

Detection light1

https://westus2.api.cognitive.microsoft.com/customvision/v3.0/Prediction/0f603abc-aaed-4b23-a639-3986c60bfce9/detect/iterations/maskm

Authorization Headers (11) Body Pre-request Script Tests Settings

form-data x-www-form-urlencoded raw binary GraphQL JSON

"url": "https://github.com/retkowsky/CustomVision_Datasets/blob/master/Test%20Mask%20(1).jpg?raw=true"

Cookies Headers (8) Test Results

Raw Preview Visualize JSON

```
id: "45e1a1b4-ec8e-4b12-bac4-e92ebc28634b",
project: "0f603abc-aaed-4b23-a639-3986c60bfce9",
iteration: "f272fd1f-08ba-4970-b71d-f5336a5a8175",
created: "2020-12-08T18:08:27.763Z",
predictions: [
  {
    "probability": 0.8688804,
    "tagId": "95adcb9b-d7a1-462d-8f12-8d112857cb46",
    "tagName": "Mask",
    "boundingBox": {
      "left": 0.3191821,
      "top": 0.52069265,
      "width": 0.3791104,
      "height": 0.42860198
    }
  },
  {
    "probability": 0.07590754,
    "tagId": "95adcb9b-d7a1-462d-8f12-8d112857cb46",
    "tagName": "Mask",
    "boundingBox": {
      "left": 0.3191821,
      "top": 0.52069265,
      "width": 0.3791104,
      "height": 0.42860198
    }
  }
]
```

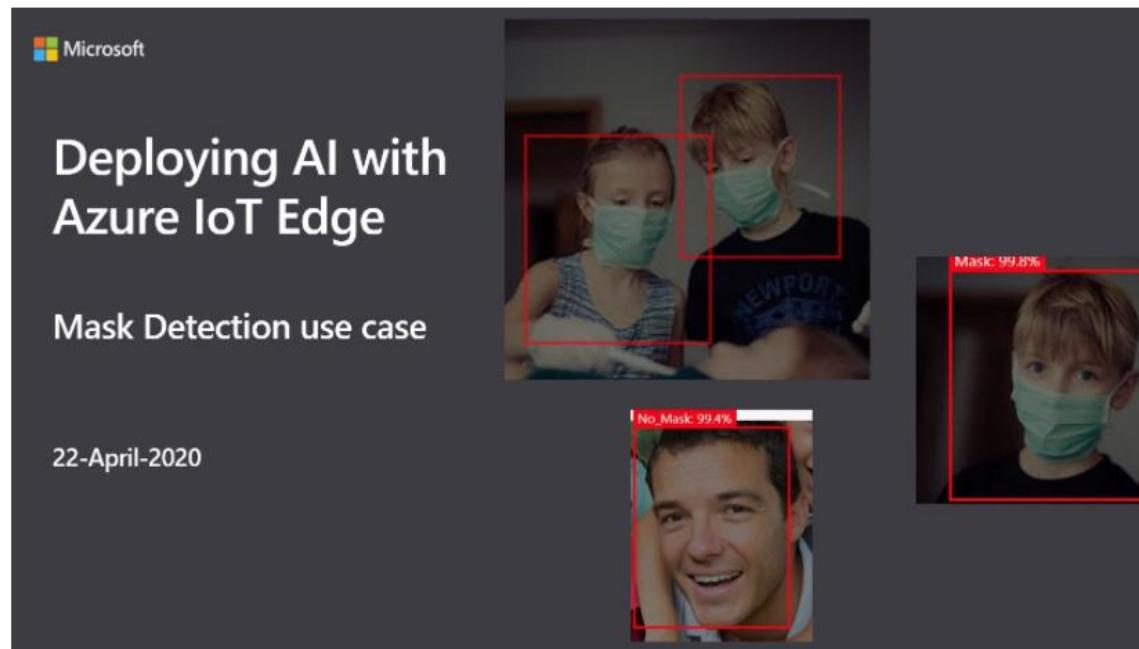
A red box highlights the first prediction object in the JSON response, specifically the bounding box coordinates.

Custom vision with Edge deployment

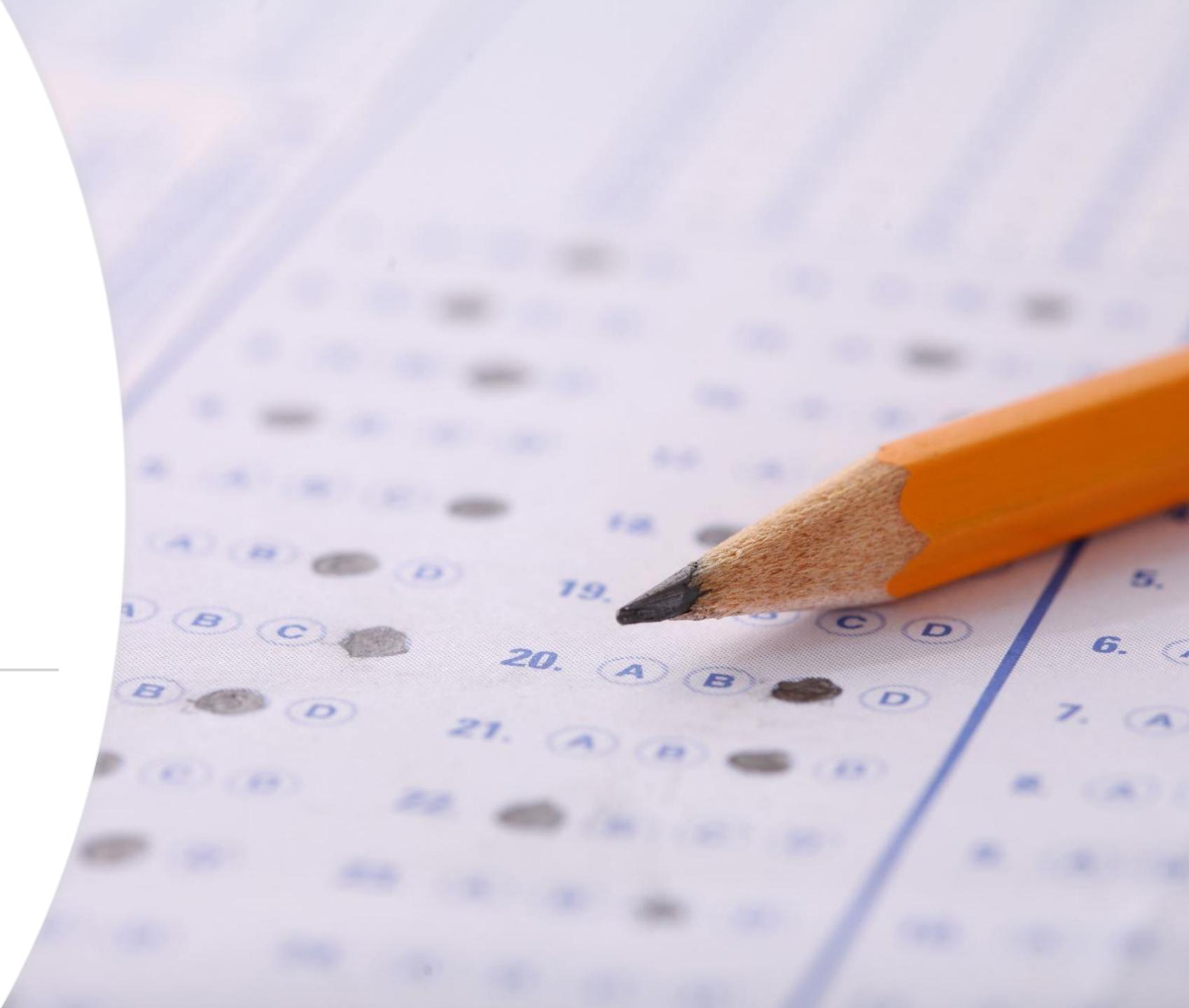
<https://github.com/retkowsky/MaskDetection>

Creation of a Mask Detection model running on the edge with Azure AI Dev Kit

1. Creation of a custom vision model using Microsoft customvision.ai (<https://www.customvision.ai>)
2. Saving the AI Dev Kit custom vision model into an Azure blob Storage.
3. Adding the location of the custom vision model into the Azure Edge device configuration.
4. Then you can use our video camera with the new custom vision model running directly on the EDGE in order to detect mask or no mask attributes from a video stream.

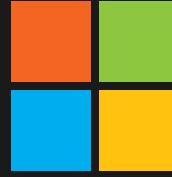


Quiz time 3



Q&A





Microsoft Azure

Be future
ready

Build on
your terms

Operate hybrid
seamlessly

Trust
your cloud