

Democratization of AI with Cognitive Services

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UST Global





Adnan Masood

Adnan Masood, Ph.D. is an Artificial Intelligence and Machine Learning researcher, software architect, and Microsoft MVP (Most Valuable Professional) for Data Platform. As Chief Architect of AI and Machine Learning at UST Global, he collaborates with Stanford Artificial Intelligence Lab, and MIT AI Lab for building enterprise solutions.

Author of Amazon bestseller in programming languages, "**Functional Programming with F#**", Dr. Masood teaches Data Science at Park University, and has taught Windows Communication Foundation (WCF) courses at the University of California, San Diego. He is a regular speaker to various academic and technology conferences (WICT, DevIntersection, IEEE-HST, IASA, and DevConnections), local code camps, and user groups. He also volunteers as STEM (Science Technology, Engineering and Math) robotics coach for elementary and middle school students.

A strong believer in giving back to the community, Dr. Masood is a co-founder and president of the Pasadena .NET Developers group, co-organizer of Tampa Bay Data Science Group, and Irvine Programmer meetup. His recent talk at Women in Technology Conference (WICT) Denver highlighted the importance of diversity in STEM and technology areas, and was featured by variety of news outlets.



Microsoft AI Services

With Azure AI services you can build next-gen of smart applications where your data lives, in the intelligent cloud, on-premises and on the intelligent edge. AI services include from pre-built APIs, such as Cognitive Services & Conversational AI with Bot tools, to building custom models with Azure Machine Learning for any scenario.

Microsoft Cognitive Toolkit / Deep Learning

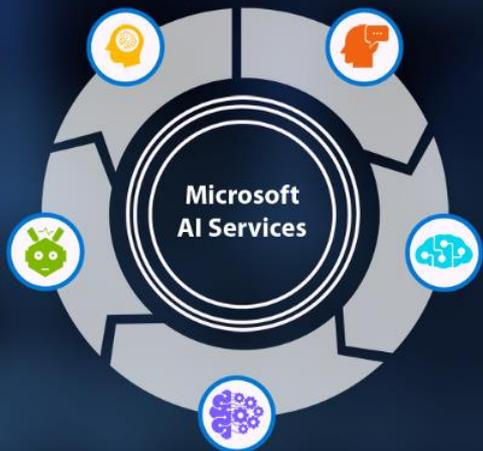
A free, open-source, commercial-grade toolkit that trains deep learning algorithms to learn like human brain.

- Empowers you to harness the intelligence within massive datasets
- Provides uncompromised scale, speed, and accuracy with commercial-grade quality
- Compatibility with languages you use like C++ and Python

Azure Bot Framework

Build, connect, deploy, and manage intelligent bots to interact naturally with your users on websites, and other apps.

- Integrated environment that is purpose-built for bot development with the Microsoft Bot Framework
- Give your bot intelligence with Cognitive Services
- Integration across multiple channels – Website, App, Email, Skype, Slack, Cortana, Facebook Messenger and more



Azure Machine Learning

A fully-managed cloud service that enables you to easily build, deploy and share predictive analytics solutions.

- Container based AI deployment from cloud to edge
- Python pip-installable extensions for Azure ML – Build & deploy highly accurate ML & deep learning models
- Package pre-built models like predictive maintenance, image classification & speech processing and deploy to IoT devices

Intelligent Applications

Experience the intelligence built into Microsoft products and services you use every day – from Office to Skype to Calendar

- Intelligent Search – Makes it easier to find what you're looking for
- Microsoft Translator - translate real time via text, voice and video across experiences like Skype
- AI in Office 365 - Connect to relevant information, and surface new insights

Cognitive Services

APIs and services that allow systems to speak, hear, see, understand and interpret human needs

- APIs for speech, vision, language, search, and knowledge
- Customised to your organisation's availability, security and compliance requirements
- Works across devices and platforms such as iOS, Android, and Windows

Ask us for an Envisioning Session on Microsoft AI Services.

Source **WinWire** via **@BrianJohnson_01**

Pre-Built AI



Vision

Computer vision
Face
Emotion
Content Moderator
Video
Video Indexer



Speech

Text analytics
Spell check
Web language model
Linguistic analysis (NLP)
Translator



Language

Speaker recognition
Speech
Speech to text
Text to custom speech



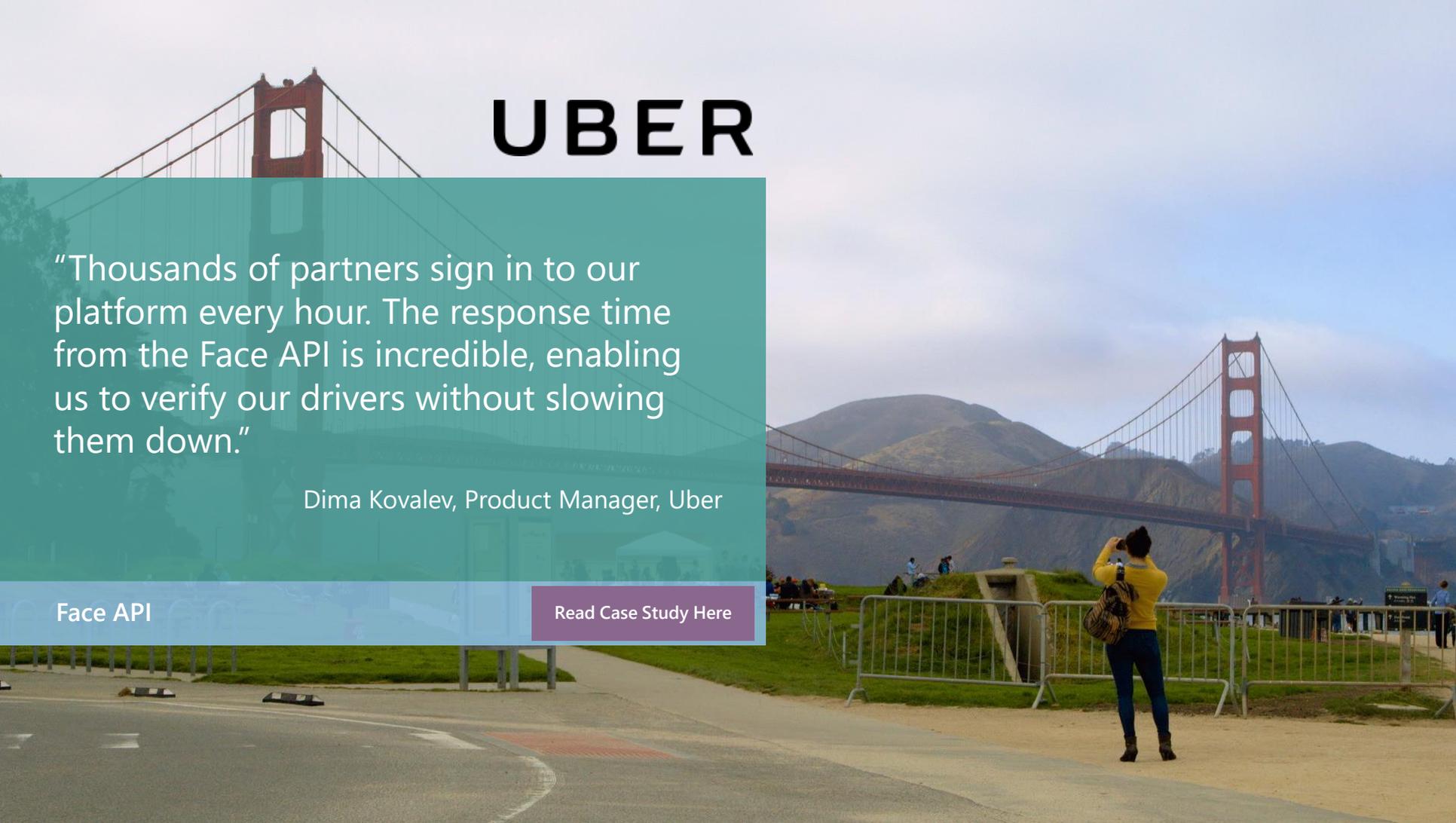
Knowledge

Web search
Image search
Video search
News search
Autosuggest



Search

Academic knowledge
Entity linking service
Knowledge exploration
QnA maker

The background of the entire slide is a photograph of the Golden Gate Bridge in San Francisco. The bridge's red towers and suspension cables are visible against a cloudy sky. In the foreground, a person in a yellow jacket is seen from behind, taking a photo of the bridge. A metal barricade and a paved road are also visible in the lower part of the image.

UBER

“Thousands of partners sign in to our platform every hour. The response time from the Face API is incredible, enabling us to verify our drivers without slowing them down.”

Dima Kovalev, Product Manager, Uber

Face API

[Read Case Study Here](#)



A better TV Experience

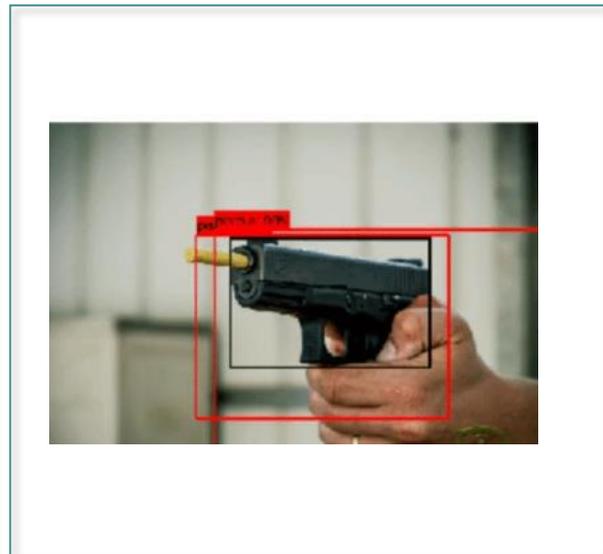
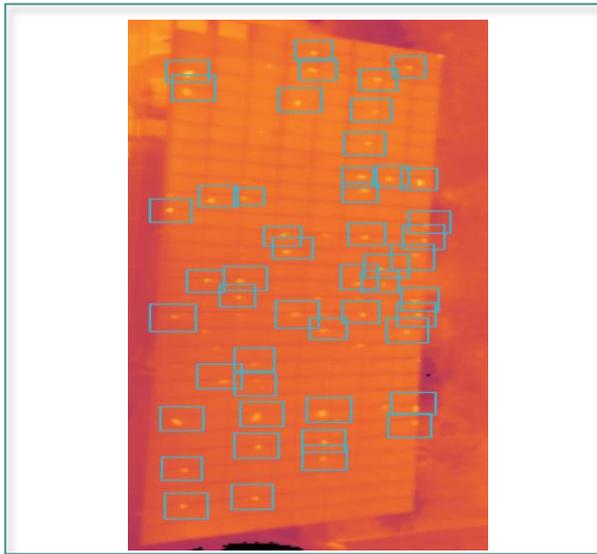


"The results are very impressive. The Microsoft Cognitive Services Recommendations API has helped us take a big step in improving our user experience and building more loyalty to our services"

With Cortana Intelligence Suite capabilities and Azure Machine Learning APIs, we are looking forward to additional integrations that will give us the flexibility to use data in different ways so we can continue to build new services for our customers."

Joana Pina Pereira,
Head of TV Business Department
MEO at Portugal Telecom

Three real projects



Open CV and Tensorflow



Secretary of State Application to Register a Foreign Limited Liability Company (LLC)		LLC-5	
<p>IMPORTANT — Read instructions before completing this form. Must be submitted with a current Certificate of Good Standing issued by the government agency where the LLC was formed. See instructions. Filing Fee — \$70.00 Copy Fees — First page \$1.00; each attachment page \$0.50; Certification Fee — \$5.00 Note: Registered LLCs in California may have to pay minimum \$800 tax to the California Franchise Tax Board each year. For more information, go to https://www.ftb.ca.gov.</p>			
			This Space For Office Use Only
1a. LLC Name (Enter the exact name of the LLC as listed on your attached Certificate of Good Standing.)			
Bristol Praders, LLC			
1b. California Alternate Name, if Required (See Instructions — Only enter an alternate name if the LLC name in 1a is not available in California.)			

2. LLC History (See Instructions — Ensure that the formation date and jurisdiction match the attached Certificate of Good Standing.)			
a. Date LLC was formed in home jurisdiction (MM/DD/YYYY) b. Jurisdiction (State, foreign country or place where this LLC is formed.)			
3 / 22 / 2017		Delaware	
c. Authority Statement (Do not alter Authority Statement) This LLC currently has powers and privileges to conduct business in the state, foreign country or place entered in item 2b.			
3. Business Addresses (Enter the complete business addresses. Items 3a and 3b cannot be a P.O. Box or "in care of" an individual or entity.)			
a. Street Address of Principal Executive Office - Do not enter a P.O. Box			
City (no abbreviations) San Francisco	State CA	Zip Code 94104	
b. Street Address of Principal Office in California, if any - Do not enter a P.O. Box			
City (no abbreviations) CA	State CA	Zip Code CA	
c. Mailing Address of Principal Executive Office, if different than item 3a			
City (no abbreviations) CA	State CA	Zip Code CA	
4. Service of Process (Must provide either Individual OR Corporation)			
INDIVIDUAL — Complete items 4a and 4b only. Must include agent's full name and California street address.			
a. California Agent's First Name (If agent is not a corporation)		Middle Name	Last Name
Jeffrey		S.	Kott
b. Street Address of agent if not a corporation - Do not enter a P.O. Box		City (no abbreviations)	State Zip Code
400 Montgomery Street, Suite 400		San Francisco	CA 94104
CORPORATION — Complete item 4c only. Only include the name of the registered agent Corporation.			
c. California Registered Corporate Agent's Name (If agent is a corporation) — Do not complete item 4a or 4b.			

5. Read and Sign Below (See Instructions. Title not required.) I am authorized to sign on behalf of the <u>Greign LLC</u> .			
Signature		Todd McLeay Type or Print Name	
LLC-A (REV 01/09/17)		2017 California Secretary of State www.sos.ca.gov/business	

a. Street Address of Principal Executive Office - Do not enter a P.O. Box 400 Montgomery Street, Suite 400	City (no abbreviations) San Francisco	State CA	Zip Code 94104
b. Street Address of Principal Office in California, if any - Do not enter a P.O. Box	City (no abbreviations)	State CA	Zip Code CA
c. Mailing Address of Principal Executive Office, if different than item 3a	City (no abbreviations)	State	Zip Code

State
CA

City (no abbreviations)
San Francisco

Zip Code
94104

b. Jurisdiction (State, foreign country or place where this LLC is formed.)
Delaware

Bottom of the Basket Fraud and Theft Analysis



Business Problem

The space between the top of the cart and the bottom of the cart is responsible for millions of dollars worth of merchandise that is unpaid.
How do we stop this pragmatically?

Key Business Value:

Reducing Fraud is adding millions back to the bottom line without doing much. By having a camera that scans the bottom of the cart, cashiers can make sure that all products are scanned and accounted for.

Technologies Used:

Computer vision, Object Detection, and Machine learning.



[\(4\) Build 2017: Workplace Safety](#) x [DevInterSection2018.pptx](#) x +
<https://www.youtube.com/watch?v=pL-c00M2CnI>

Premium Search

0:09 / 2:02

Build 2017: Workplace Safety Demonstration

159,773 views

793 33 SHARE SAVE ...

Up next

AUTOPLAY



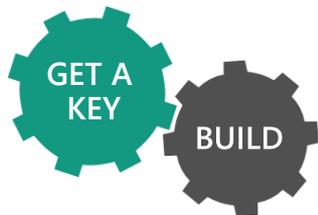
Funny Workplace Safety Training Video
 Channel 1 Creative Media

Why Microsoft Cognitive Services?

Easy

Roll your own with REST APIs

Simple to add: just a few lines of code required



Flexible

Integrate into the language and platform of your choice

Breadth of offerings helps you find the right API for your app



Tested

Built by experts in their field from Microsoft Research, Bing, and Azure Machine Learning

Quality documentation, sample code, and community support



Microsoft Cognitive Services

Give your apps
a human side



Vision

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



Speech

Bing Speech | Custom Speech Service | Speaker Recognition



Language

Bing Spell Check | Language Understanding | Linguistic Analysis | Text Analytics | Translator Text & Speech | Web Language Model



Knowledge

Academic Knowledge | Entity Linking | Knowledge Exploration | Recommendations | QnA Maker | Custom Decision Service



Search

Bing Autosuggest | Bing Image Search | Bing News Search | Bing Video Search | Bing Web Search | Bing Custom Search



Labs

Project Prague | Project Cuzco | Project Johannesburg | Project Nanjing | Project Abu Dhabi | Project Wollongong

Cognitive Services

microsoft.com/cognitive

 Vision

Computer Vision

Emotion

Face

Video

 Speech

Custom Recognition

Speaker Recognition

Speech

Translator

 Language

Bing Spell Check

Linguistic Analysis

Language Understanding

Text Analytics

WebLM

 Knowledge

Academic Knowledge

Entity Linking

Knowledge Exploration

Recommendations

 Search

Bing Web Search

Bing Image Search

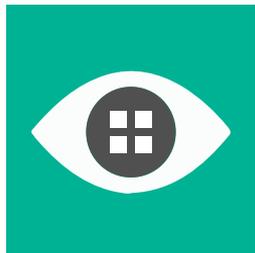
Bing Video Search

Bing News Search

Bing Autosuggest



Vision



Computer Vision API

Distill actionable information from images



Face API

Detect, identify, analyze, organize, and tag faces in photos



Emotion API

Personalize experiences with emotion recognition



Video API

Analyze, edit, and process videos within your app



Speech



Bing Speech API

Convert speech to text and back again, and understand its intent



Speaker Recognition API

Give your app the ability to know who's talking



Custom Recognition Intelligent Service

Fine-tune speech recognition for anyone, anywhere



Language



Bing Spell Check API

Detect and correct spelling mistakes within your app



Web Language Model API

Leverage the power of language models trained on web-scale data



Linguistic Analysis API

Easily parse complex text with language analysis



Language Understanding Intelligent Service (LUIS)

Teach your apps to understand commands from your users



Text Analytics API

Detect sentiment, key phrases, topics, and language from your text



Knowledge



Academic Knowledge API

Explore relationships
among academic
papers, journals, and
authors



Knowledge Exploration Service

Add interactive search
over structured data to
your project



Entity Linking Service

Contextually extend
knowledge of people,
locations, and events



Recommendations API

Provide personalized
product
recommendations for
your customers



Search



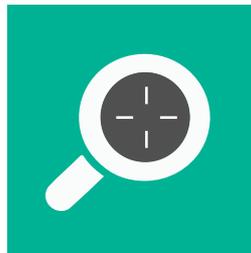
Bing Web Search API

Connect powerful search to your apps



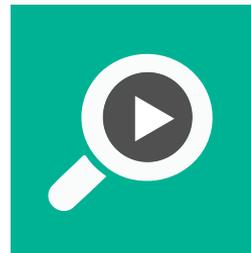
Bing Autosuggest API

Give your app intelligent autosuggest options for searches



Bing Image Search API

Bring advanced image and metadata search to your app



Bing Video Search API

Trending videos, detailed metadata, and rich results

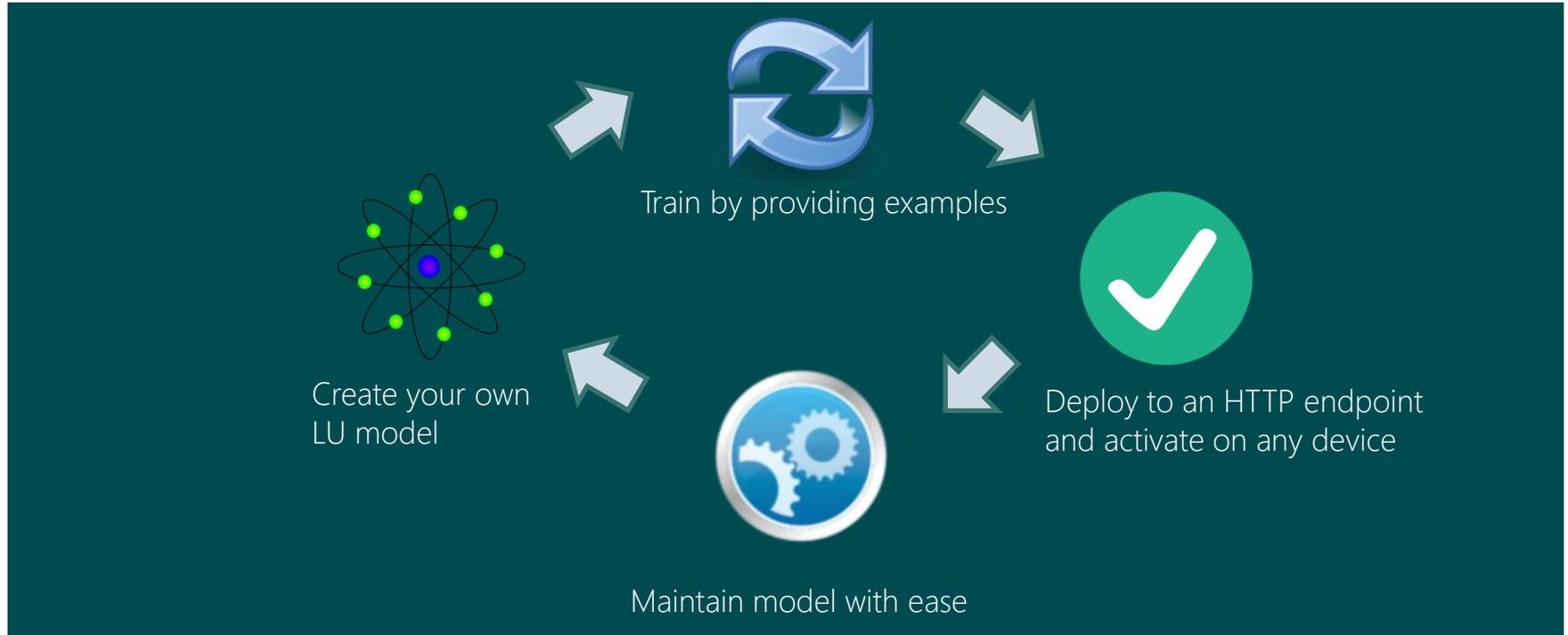


Bing News Search API

Link your users to robust and timely news searches

Introducing Language Understanding Intelligence Service (LUIS)

A Microsoft Cognitive Service that provides developers with an easy way to create language models to allow applications to understand user commands.

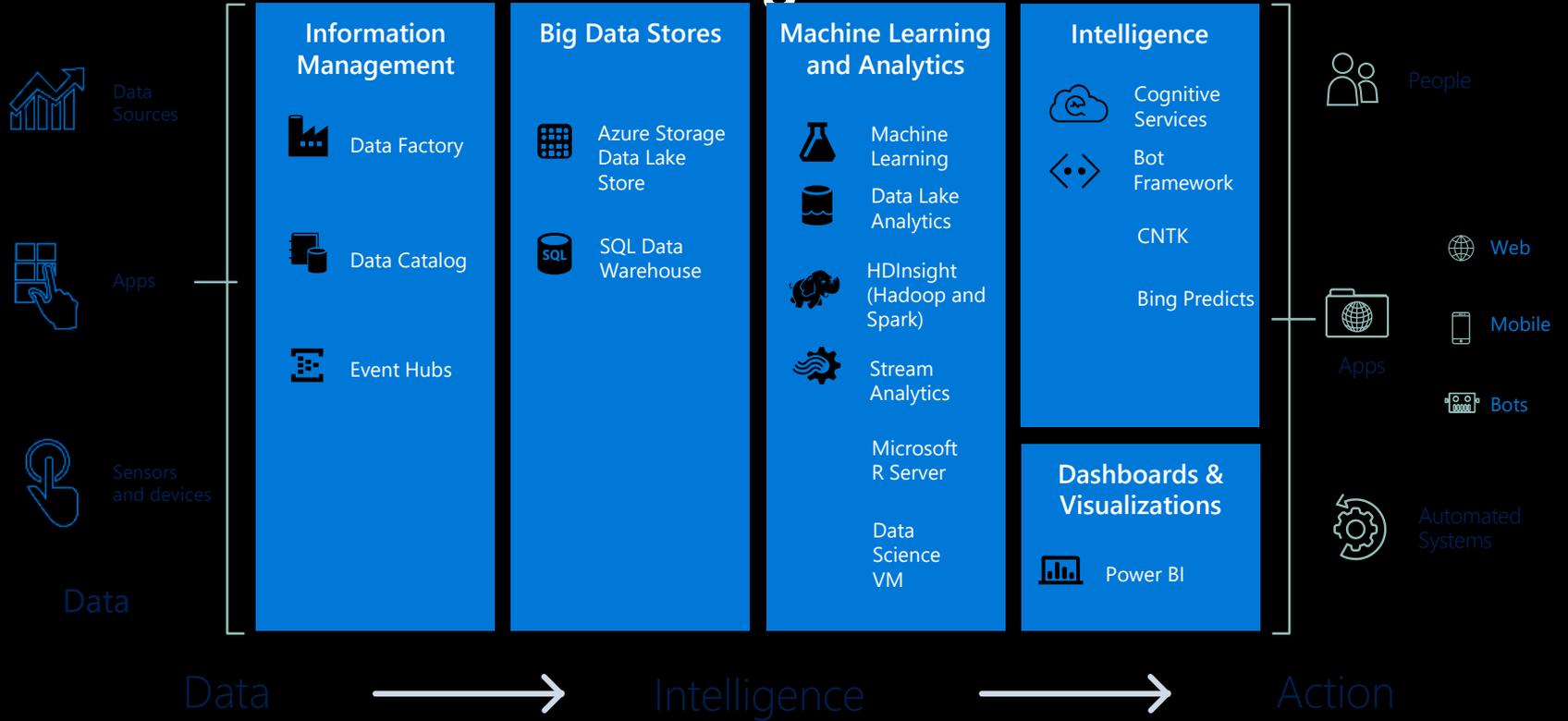


Moving to Production & Scaling

Application patterns



Transform data into intelligent action with Cortana Intelligence





Analyze Image – Example



Type of Image:

Clip Art Type 0 Non-clipart
Line Drawing Type 0 Non-Line Drawing
Black & White Image False

Content of Image:

Categories [{"name": "people_swimming", "score": 0.099609375 }]
Adult Content False
Adult Score 0.18533889949321747
Faces [{"age": 27, "gender": "Male", "faceRectangle": {"left": 472, "top": 258, "width": 199, "height": 199}}

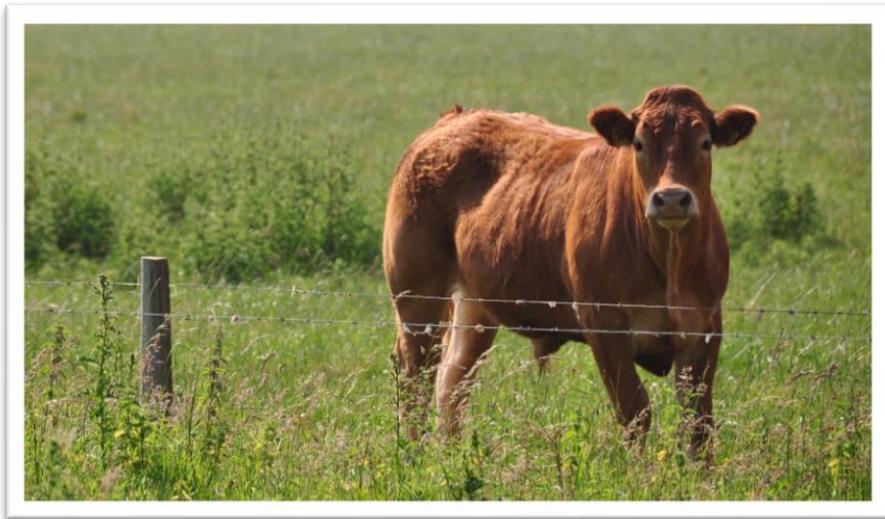
Image Colors:

Dominant Color Background White
Dominant Color Foreground Grey
Dominant Colors White
Accent Color 



Analyze Image – Example

Content of Image:

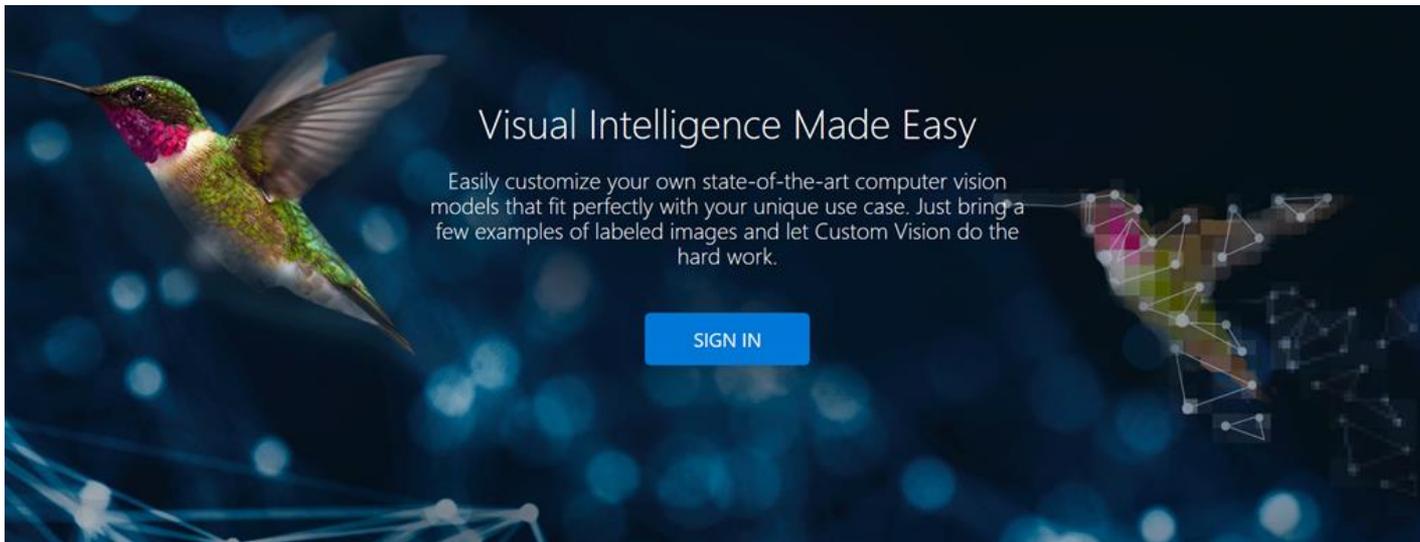


Categories

```
v0: [{ "name": "animal", "score": 0.9765625 }]
V1: [{ "name": "grass", "confidence": 0.999992847442627 },
  { "name": "outdoor", "confidence": 0.9999072551727295 },
  { "name": "cow", "confidence": 0.99954754114151 },
  { "name": "field", "confidence": 0.9976195693016052 },
  { "name": "brown", "confidence": 0.988935649394989 },
  { "name": "animal", "confidence": 0.97904372215271 },
  { "name": "standing", "confidence": 0.9632768630981445 },
  { "name": "mammal", "confidence": 0.9366017580032349,
    "hint": "animal" },
  { "name": "wire", "confidence": 0.8946959376335144 },
  { "name": "green", "confidence": 0.8844101428985596 },
  { "name": "pasture", "confidence": 0.8332059383392334 },
  { "name": "bovine", "confidence": 0.5618471503257751,
    "hint": "animal" },
  { "name": "grassy", "confidence": 0.48627158999443054 },
  { "name": "lush", "confidence": 0.1874018907546997 },
  { "name": "staring", "confidence": 0.165890634059906 }]
```

Describe

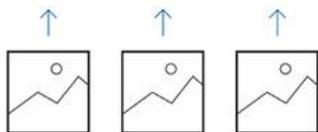
```
0.975 "a brown cow standing on top of a lush green field"
0.974 "a cow standing on top of a lush green field"
0.965 "a large brown cow standing on top of a lush green field"
```



Visual Intelligence Made Easy

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

SIGN IN



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.

89%



93%



91%



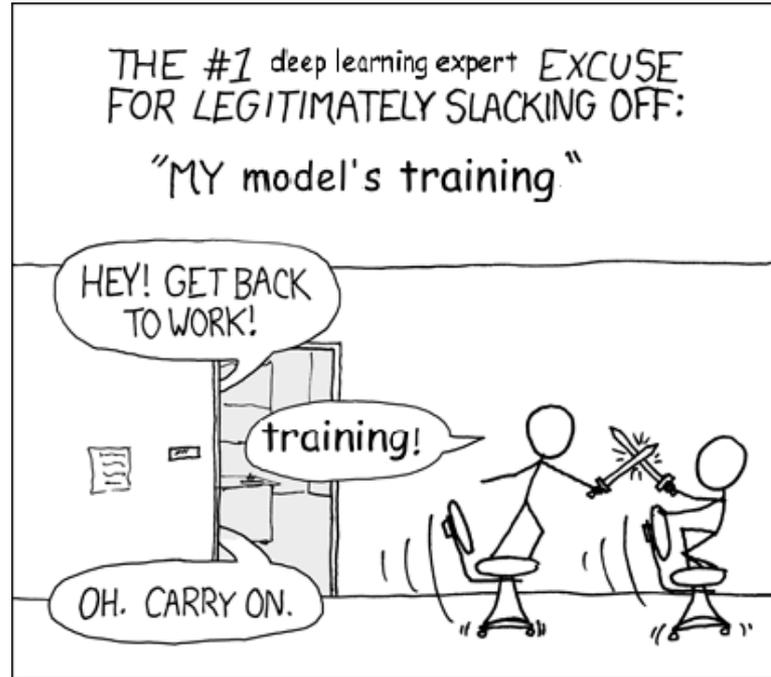
Evaluate

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

Call to action

- Get started for free at <https://www.microsoft.com/cognitive-services>
- New unified documentation portal: <https://docs.microsoft.com/en-us/azure/cognitive-services/>
- Re-visit Build session recordings on [Channel 9](#).
- Continue your education at [Microsoft Virtual Academy](#) online.

Conclusion



Questions?

Please use EventsXD to fill out a session evaluation.

Thank you!