Let the Cognitive Services to help you to find your favourite cocktail



Alexander Klein

Twitter: @SQL_Alex

SQLSaturday #880 - Munich 19.10.2019







Who am 1?

Independent BI Consultant

> 15 years experience of SQL Server

Focus on Microsoft BI Stack & Azure & Al

a.klein@consulting-bi.de@SQL_Alex

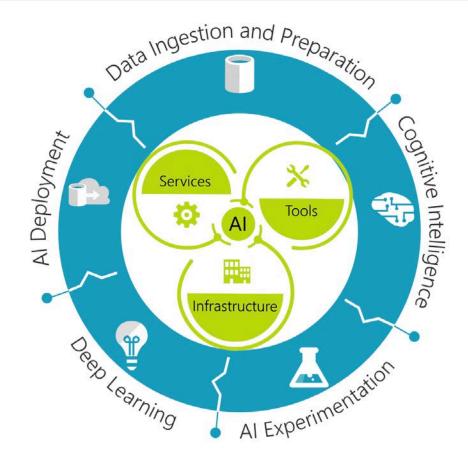


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- Al Platform Microsoft
- Cognitive Services
- Face/Emotion
- Computer Vision
- Text Analytics
- Recommendation
- Favourite cocktail demo
- What's next?

Microsoft Al platform

Use a comprehensive set of flexible <u>AI</u>
<u>services</u> for any scenario, and enterprisegrade <u>AI infrastructure</u> that runs AI workloads
anywhere at scale. Modern <u>AI tools</u>designed
for developers and data scientists help you
create AI solutions easily, and with maximum
productivity.



Al Service

Accelerate the development of AI solutions with high-level services. Use your preferred approach adapted to your targeted scenario, and achieve maximum productivity and reliability.



Cognitive Services

Use AI to solve business problems. Infuse your apps, websites, and bots with intelligent algorithms to see, hear, speak, and understand natural methods of communication.



Azure Bot Service

Accelerate development for conversational Al. Integrate seamlessly with Cortana, Office 365, Slack, Facebook Messenger, and more.



Machine Learning Services

Model AI algorithms and experiment with ease. Customize based on your requirements.

Al Infrastructure

Al compute

Flexible compute services from virtually limitless scale to the edge.



Apache Spark for Azure HDInsight

Take advantage of Apache Spark in the cloud for mission critical deployments.



Batch Al training

Experience unlimited, elastic scale-out deep learning. Run large-scale, massively parallel GPU-enabled AI development.



Al-enable your data platform



Data Lake Store

Run data transformations and AI on petabyte-scale.



Azure Cosmos DR

Integrate AI with a globally distributed, multi-model database service.



Data Science Virtual Machines

Use a friction-free data science environment that contains popular tools for data exploration, modeling, and development activities.



Azure Container Service (AKS)

Scale and orchestrate containers using Kubernetes, DC/OS, or Docker Swarm.



SQL Database

Use R, Python, and native machine learning in an industry-leading SQL DB.

AI Tools



Machine Learning Studio

Easily build, deploy, and manage predictive analytics solutions



Azure Machine Learning Workbench

Visual Al-powered data wrangling, experimentation, and lifecycle management.



Visual Studio Code Tools for Al

Build, debug, test, and deploy AI with Visual Studio Code on Windows and Mac.



Azure Notebooks

Organize your datasets and Jupyter Notebooks in a centralized library for data science and analysis.



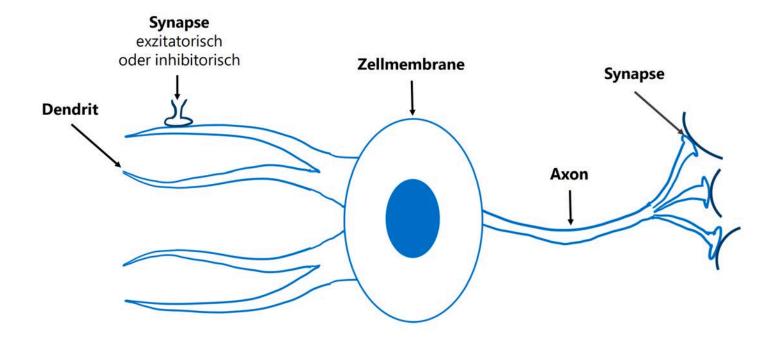
Other popular open source tools

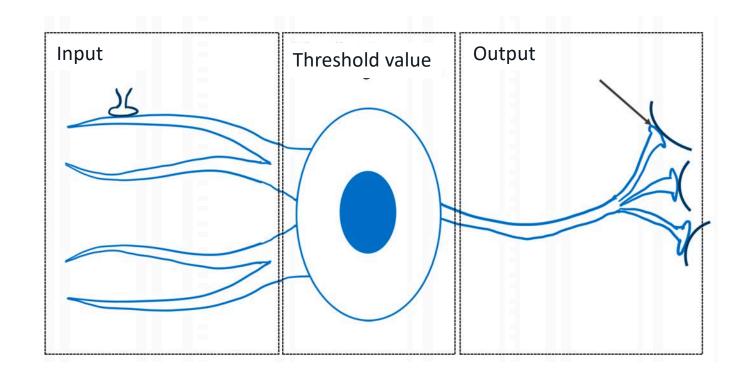
Support for Jupyter Notebooks, PyCharm, and more.

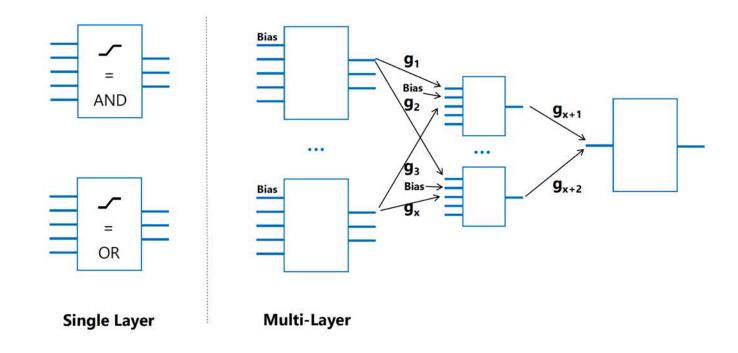


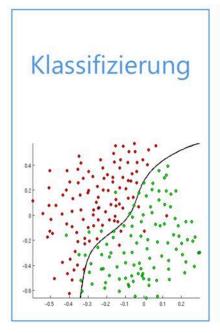
Al Toolkit for Azure IoT Edge

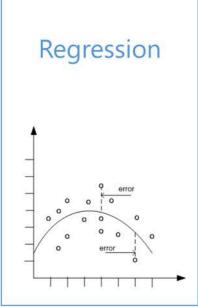
Deploy deep learning models and AI to run locally on IoT devices through pre-built models.



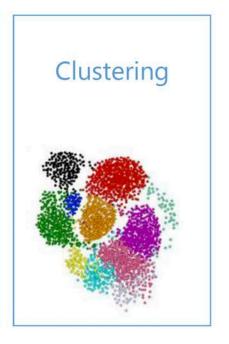




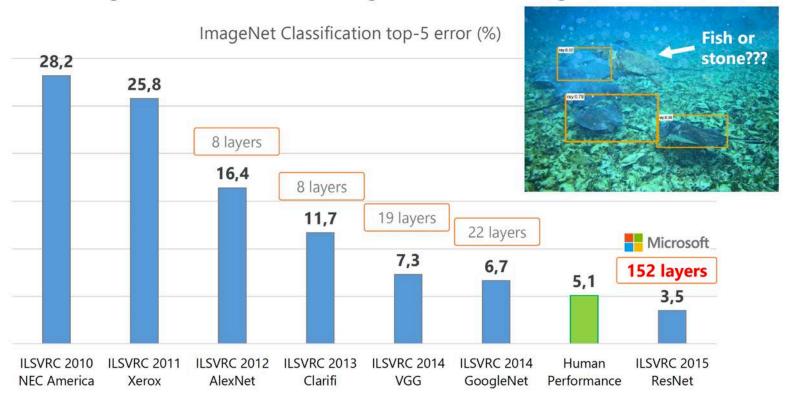








ImageNet Large Scale Visual Recognition Challenge (ILSVRC)



CPU

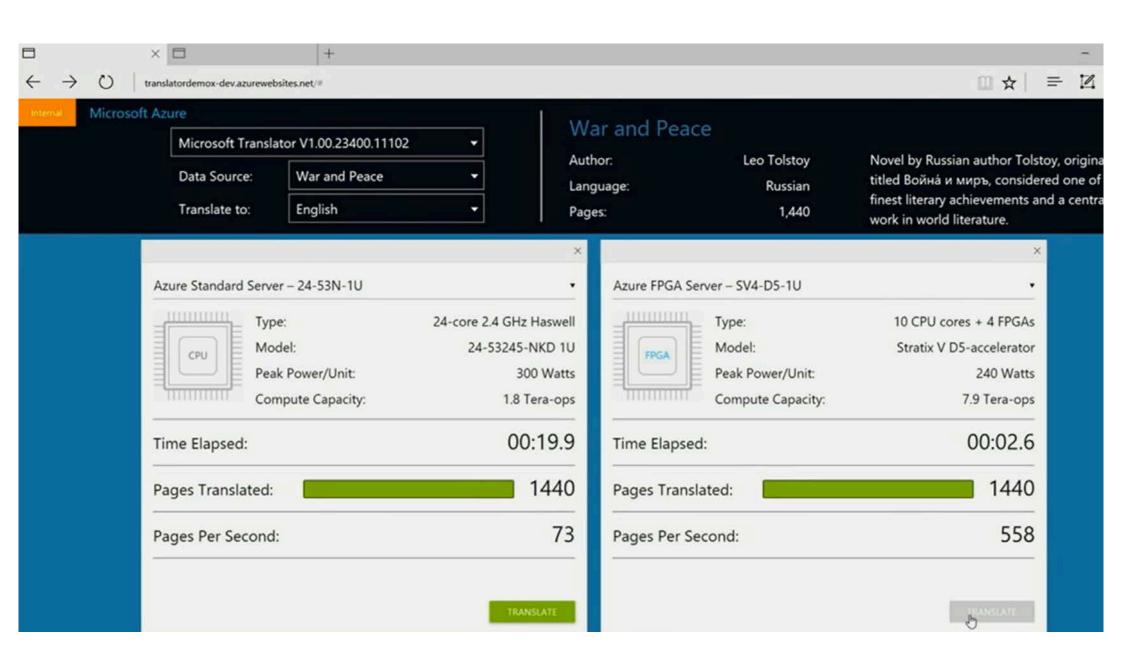
A central processing unit (CPU) is the electronic circuitry within a computer that carries out the instructions of a computer program by performing the basic arithmetic, logical, control and input/output (I/O) operations specified by the instructions.

GPU

A graphics processing unit (GPU), occasionally called visual processing unit (VPU), is a specialized electronic circuit designed to rapidly manipulate and alter memory to accelerate the creation of images in a frame buffer intended for output to a display device.

FPGA

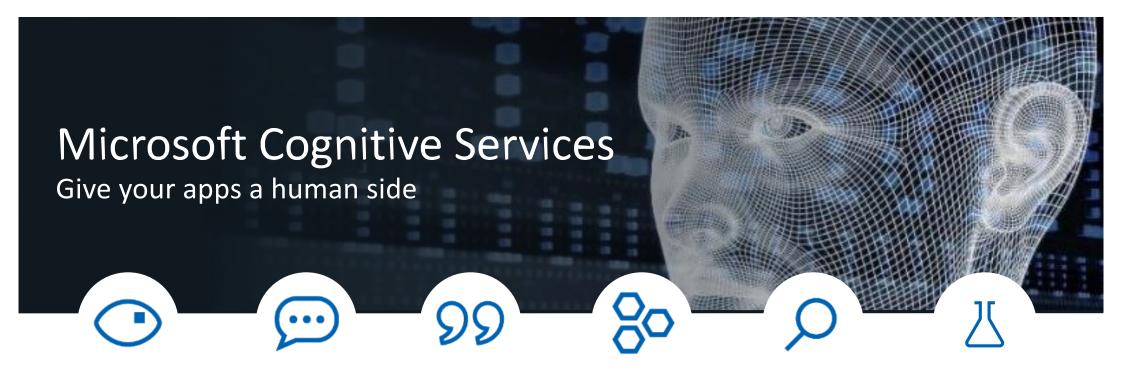
A field-programmable gate array (FPGA) is an integrated circuit designed to be configured by a customer or a designer after manufacturing – hence "field-programmable".





Microsoft Cognitive Services (formerly **Project Oxford**) are a set of APIs, SDKs and services available to developers to make their applications more intelligent, engaging and discoverable. Cognitive Services expands on Microsoft's evolving portfolio of **machine learning** APIs and enables developers to easily add intelligent features ...

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



Vision

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

Speech

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

Language

Process text and learn how to recognize what users want

Decision

Leverage these services that enable informed and efficient decisionmaking.

Search

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

Labs

An early look at emerging Cognitive Services technologies: discover, try & give feedback on new technologies before general availability



Give your apps a human side

Computer Visio

Content Moderator

Face

Wision

Video Indexer

Custom Vision Service

Ink Recognizer

Form Recognizer

Speech Server

Speaker Recognition

Speech

Languag

Understanding

Text Analytics **Language** Translator Text

QnA Maker

Immersive Reader

Content Moderator

Anomaly Detecto

Personalizer

Decision

Ring Web Sparch

Bing Visual Search

Bing Autosugg

Bing Sustant Search

Bing Entity Search

Bing Video Search

Bing News Search

Bing Image Search

Bing Local Business Search Project Anomaly Finder

Project Answer Search

Project Copysisation Learner

Project Entity Linking

Project Event Tracking

Project Ink Analysis

Project Local Insights

Project Gesture

Project Knowledge Exploration

Project Personality Chat

Proiect URL Preview

Give your apps a human side







Language

Bing Spell Check

Language

Understanding

Text Analytics







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Computer Vision

Content Moderator

Face

Video

Video Indexer

Custom Vision Service

Ink Recognizer

Form Recognizer

CUSTOMIZATION

Speech

Speech Server

Speaker Recognition

Translator Text

QnA Maker

Immersive Reader

Decision

Content Moderator

Anomaly Detector

Personalizer

Search

Bing Autosuggest

Bing Visual Search

Bing Custom Search

Bing Web Search

Bing Entity Search

Bing Video Search

Bing News Search

Bing Image Search **Bing Local Business Search** Labs

Project Academic Knowledge

Project Anomaly Finder

Project Answer Search

Project Conversation Learner

Project Entity Linking

Project Event Tracking

Project Ink Analysis

Project Local Insights

Project Gesture

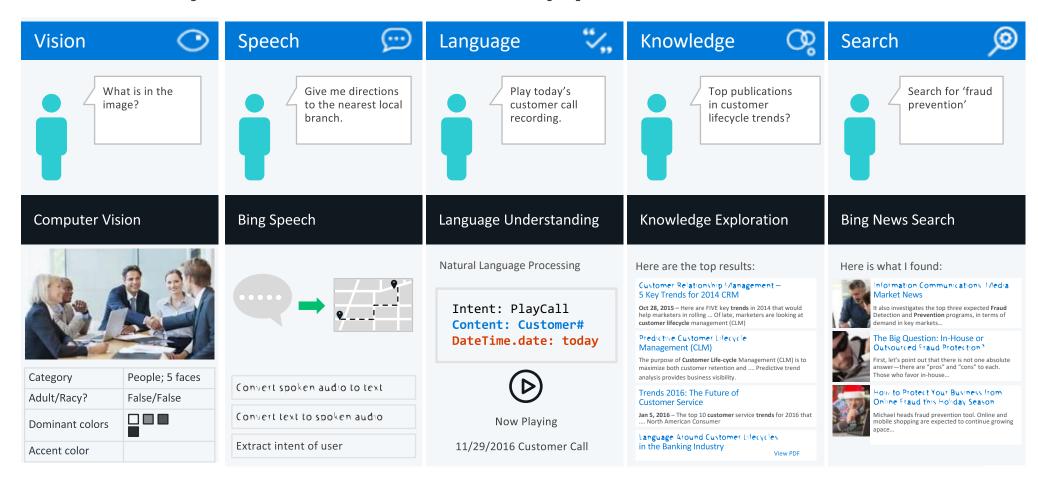
Custom Vision Service

Custom Speech Service

Language **Understanding** **Custom Decision** Service

Bing Custom Search

A variety of real-world applications



Vision





Computer Vision

Image classification
Scene and activity recognition in images
Celebrity and landmark recognition in images
Optical character recognition (OCR) in images



Ink Recognizer PREVIEW

Recognize digital ink and handwriting Recognize and pinpoint common shapes Enable productivity scenarios



Custom Vision

Try for free | Learn more Customizable image recognition



Face

Face detection in images
Person Identification in images
Emotion recognition in images
Similar face recognition and grouping in images



Video Indexer

Full analysis for the visual and audio channels of the video Conducts facial, object, keyframe recognition, OCR, and transcription Advanced insights such as topic inference, brands and emotion detection



Form Recognizer PREVIEW

Extract text, key-value pairs, and tables from documents Customized to your forms, without manual labeling Deploy anywhere, from the cloud to the edge

Computer Vision API

Analyze an image

Understand content within an image

OCR

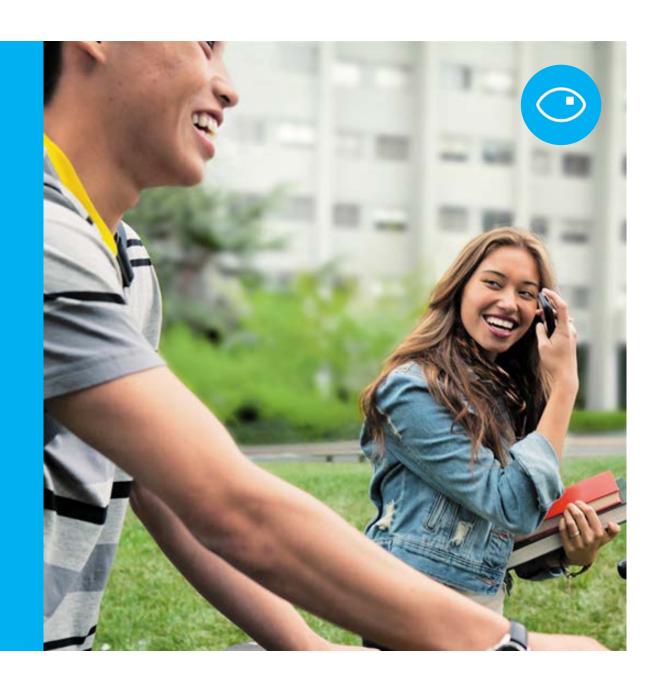
Detect and recognize words within an image

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



Analyze image

Type of image

Clip Art Type 0 Non-clipart

Line Drawing Type O 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",

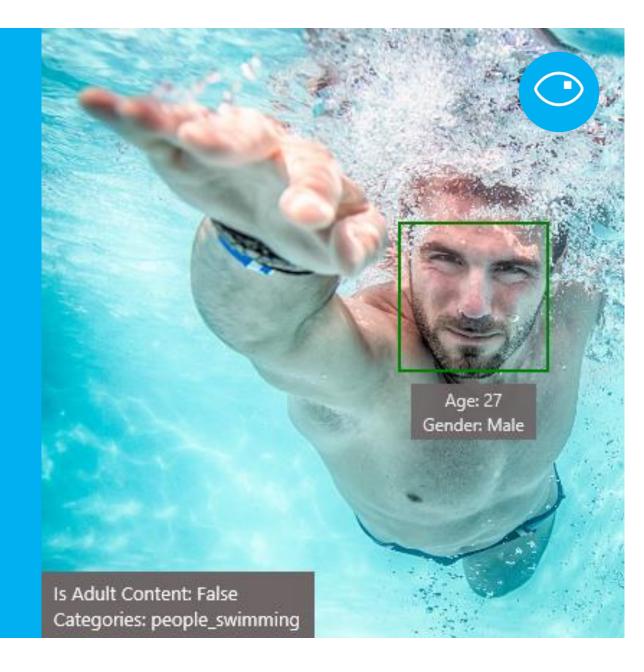
"faceRectangle": {"left": 472, "top": 258, "width": 199,

"height": 199}}]

Image colors

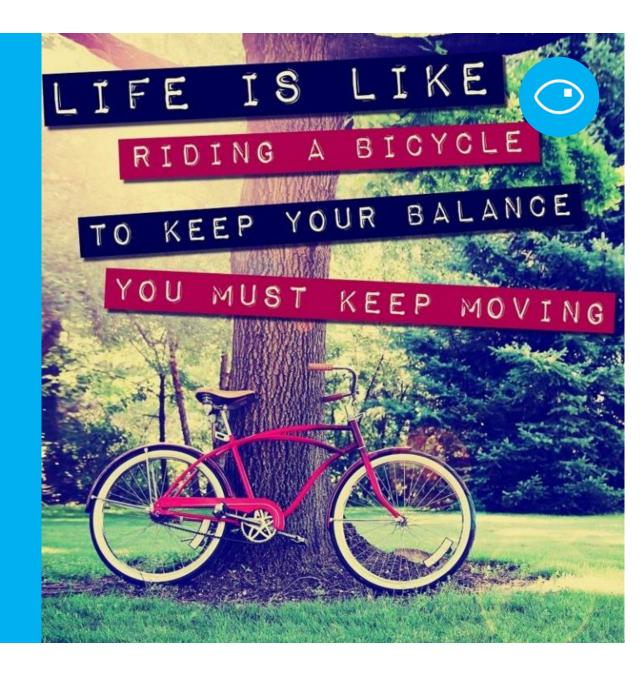
Dominant Color Background White **Dominant Color Foreground** Grey **Dominant Colors** White

Accent Color

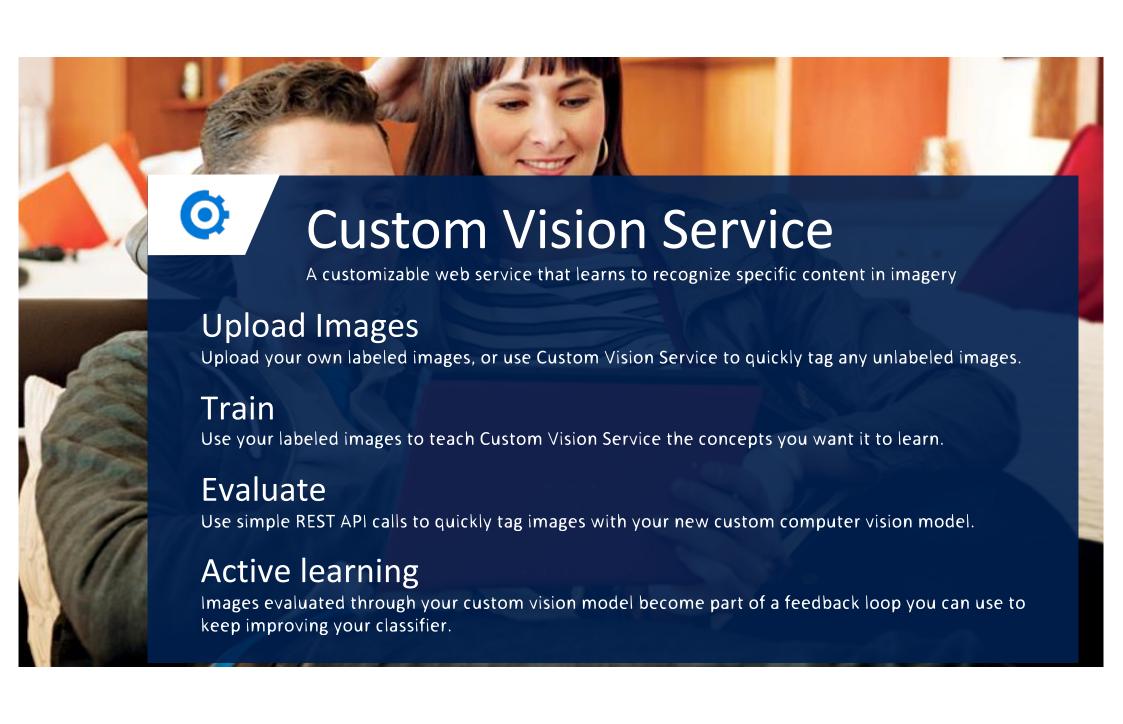


OCR

```
JSON:
 "language": "en",
"orientation": "Up",
"regions": [
   "boundingBox": "41,77,918,440",
  "lines": [
     "boundingBox": "41,77,723,89",
     "words": [
      "boundingBox": "41,102,225,64",
      "text": "LIFE"
      "boundingBox": "356,89,94,62",
      "text": "IS"
       "boundingBox": "539,77,225,64",
      "text": "LIKE"
```

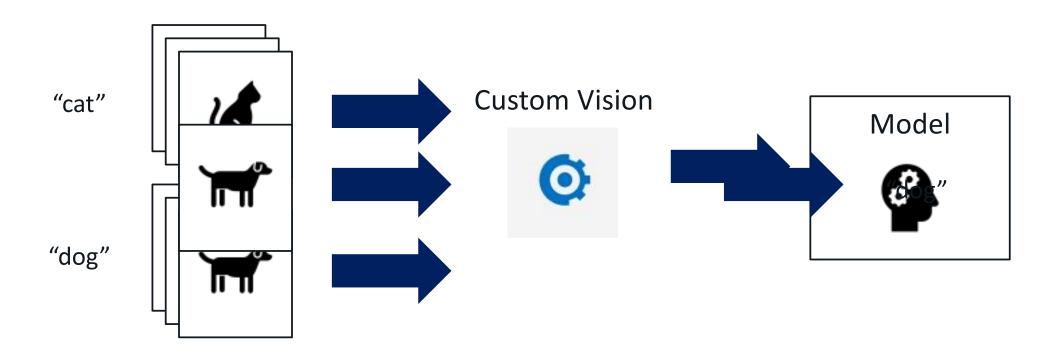


Computer Vision Demo

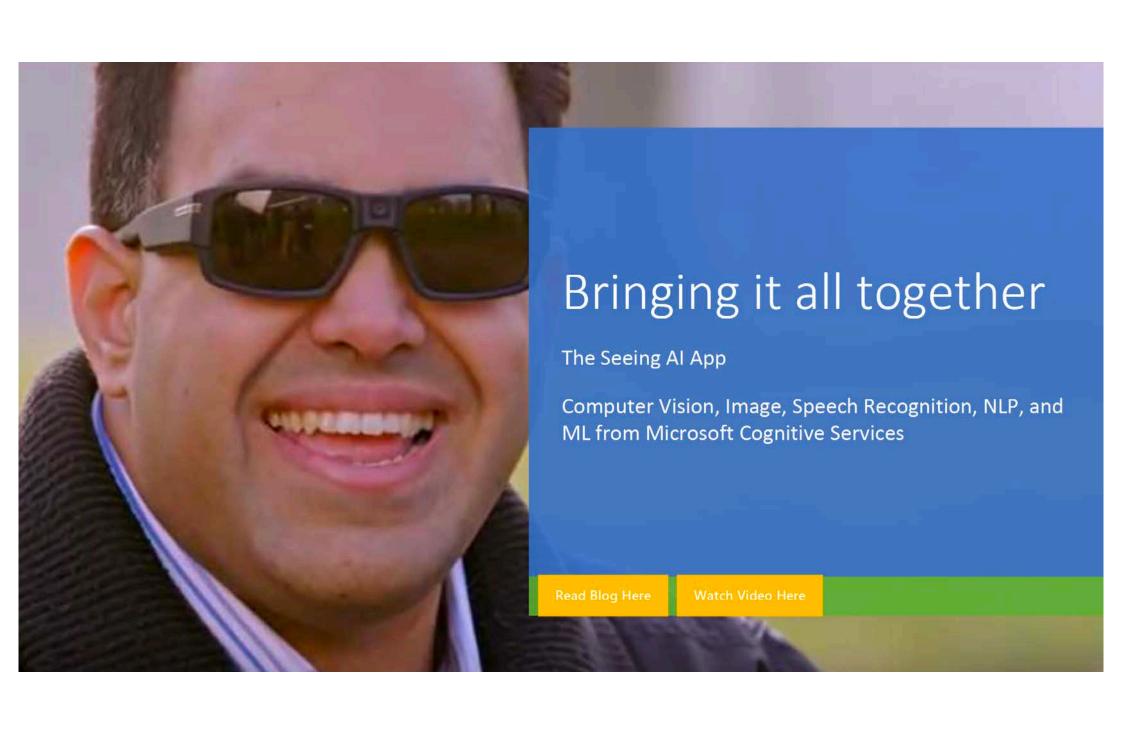


What is it?

Custom Vision Service is an easy-to-use tool for prototyping, improving, and deploying a <u>custom</u> image classifier to a cloud service, without any background in computer vision or deep learning required.



Custom Vision Demo





Text Analytics

- Language detection
 Identify the language, 120 supported laguages
- Key phrase extraction
 Extract key phrases from a piece of text and retrieve topics
- Named Entity Recognition
 Detect all named entities in the text
- Sentiment analytics
 Understand if a record has positive or negative sentiment











Text Analytics - Sentiment analysis

The API returns a numeric score between 0 and 1. Scores close to 1 indicate positive sentiment, and scores close to 0 indicate negative sentiment. Sentiment score is generated using classification techniques. The input features of the classifier include n-grams, features generated from part-of-speech tags, and word embeddings. It is supported in a variety of languages.



Text Analytics Demo

Partners ~

Support ∨

Blog

Blog / Announcements

Bringing AI to the edge

Posted on November 14, 2018









Eric Boyd, Corporate Vice President, Azure Al

We are seeing a clear trend towards a future powered by the intelligent cloud and intelligent edge. The intelligent cloud is ubiquitous computing at massive scale, enabled by the public cloud and powered by AI, for every type of application one can envision. The intelligent edge is a continually expanding set of connected systems and devices that gather and analyze data—close to end users and the data that is generated. Together, they give customers the ability to create a new class of distributed, connected applications that enable breakthrough business outcomes.

To accelerate this trend, today we are announcing the preview of Azure Cognitive Services containers, making it possible to build intelligent applications that span the cloud and the edge. Azure Cognitive Services allow developers to easily add cognitive features—such as object detection, vision recognition, and language understanding—into their applications without having direct AI or data science skills or knowledge. Over 1.2 million developers have discovered and tried Azure Cognitive Services to build and run intelligent applications. Containerization is an approach to software distribution in which an application or service is packaged so that it can be deployed in a container host with little or no modification.

With container support, customers can use Azure's intelligent Cognitive Services capabilities, wherever the data resides. This means customers can perform facial recognition, OCR, or text analytics operations without sending their content to the cloud. Their intelligent apps are portable and scale with greater consistency whether they run on the edge or in Azure.

Containers in Azure Cognitive Services

Features and benefits

- Control over data
- Control over model updates
- Portable architecture
- High throughput / low latency

Containers in Azure Cognitive Services

Service	Container
Anomaly detector *	Anomaly Detector
Computer Vision *	Recognize Text
Face *	Face
Form recognizer *	Form Recognizer
LUIS *	LUIS
Speech Service API *	Speech to text
Speech Service API *	Text to speech
Text Analytics	Key Phrase Extraction
Text Analytics	Language Detection
Text Analytics	Sentiment Analysis

^{*} Request sperate access

https://docs.microsoft.com/en-us/azure/cognitive-services/cognitive-services-container-support

Recommendation API



Recommendation systems

Predict or rank the ratings a user may give to a lot of items

Business goals of recommender systems

Increase product sales

Improve customer experience and satisfaction

Technical goals of recommender systems

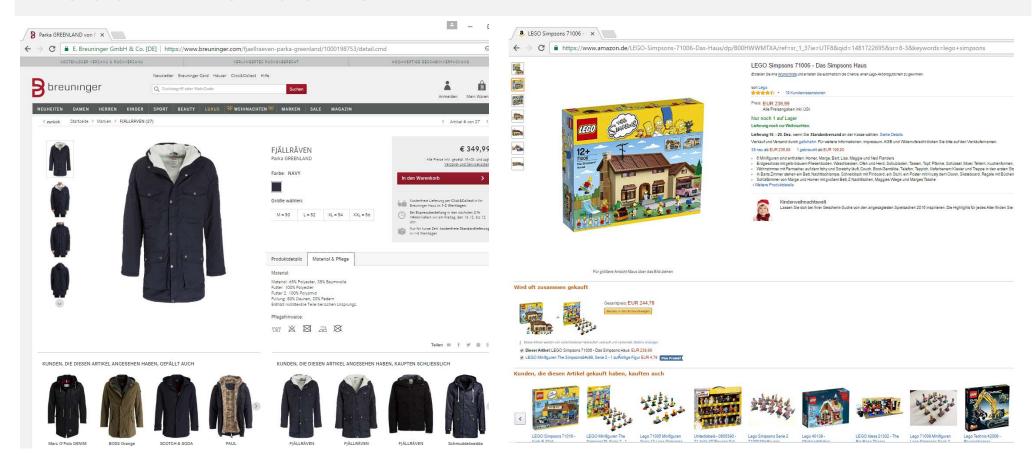
Relevance – recommend items that are relevant to a us

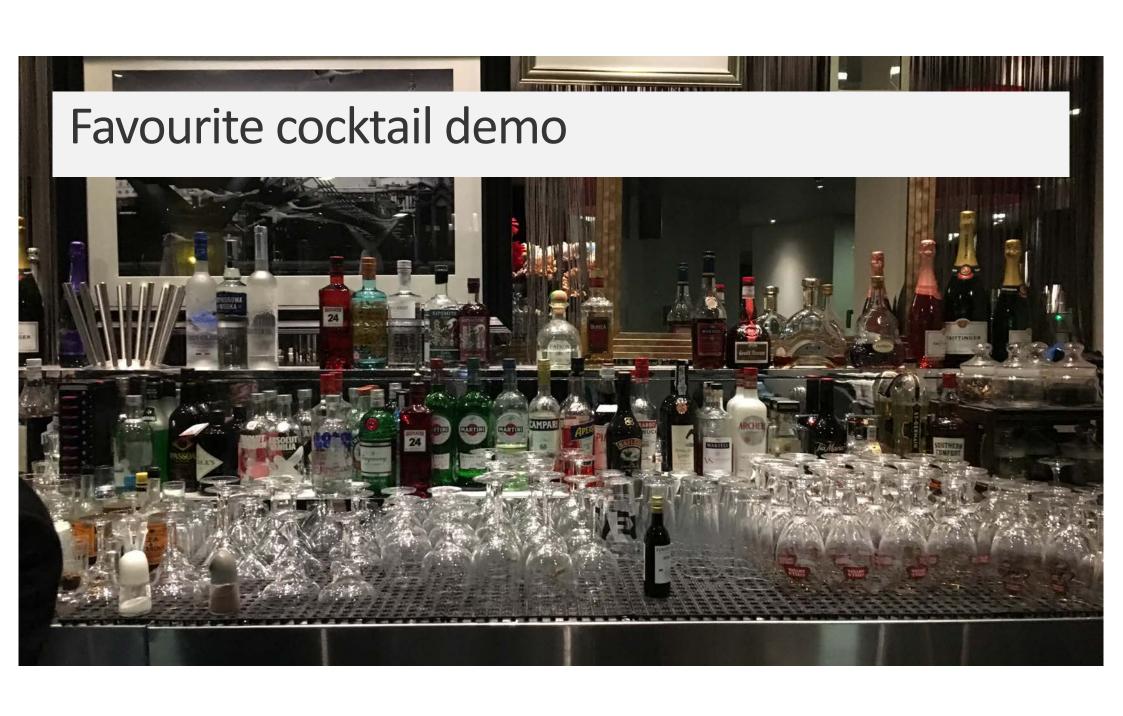
Novelty – recommend items that a user has not seen be

Serendipity – recommend items that a are surprising to a user

Diversity – recommend dissimilar items to a user

Recommendation API





The idea

How can I use this pretty cool API's for myself?

The idea

Once upon a time, one evening I was sitting in a bar and I didn't know which cocktail to choose from the menu.

The idea

That's where the idea was born. Why not use the API's to generate a recommendation based on my emotions.

How to

What we need:

- Face API
- Emotion API
- Recommendation API

Face Attributes

```
"faceAttributes": {
    "age": 71.0,
    "gender": "male",
    "smile": 0.88,
    "facialHair": {
        "moustache": 0.8,
        "beard": 0.1,
        "sideburns": 0.02
    },
   "glasses": "sunglasses",
    "headPose": {
        "roll": 2.1,
        "yaw": 3,
        "pitch": 0
    "emotion":{
        "anger": 0.575,
        "contempt": 0,
        "disgust": 0.006,
        "fear": 0.008,
        "happiness": 0.394,
        "neutral": 0.013.
        "sadness": 0,
        "surprise": 0.004
    },
```

```
"hair": {
    "bald": 0.0,
   "invisible": false,
    "hairColor": [
       {"color": "brown", "confidence": 1.0},
       {"color": "blond", "confidence": 0.88},
       {"color": "black", "confidence": 0.48},
       {"color": "other", "confidence": 0.11},
       {"color": "gray", "confidence": 0.07},
       {"color": "red", "confidence": 0.03}
},
"makeup": {
   "eyeMakeup": true,
    "lipMakeup": false
},
"occlusion": {
    "foreheadOccluded": false,
    "eyeOccluded": false,
    "mouthOccluded": false
},
```

```
"accessories": [
    {"type": "headWear", "confidence": 0.99},
    {"type": "glasses", "confidence": 1.0},
    {"type": "mask"," confidence": 0.87}
],
"blur": {
    "blurLevel": "Medium",
    "value": 0.51
},
"exposure": {
    "exposureLevel": "GoodExposure",
    "value":0.55
},
"noise": {
    "noiseLevel": "Low",
    "value": 0.12
```

Recommendations catalog file

Name	Mandatory	Туре	Description
Item Id	Yes	[A-z], [a-z], [0-9], [_] (Underscore), [-] (Dash) Max length: 50	
Item Name	Yes	Any alphanumeric characters Item name. Max length: 255	
Item Category	Yes	Any alphanumeric characters Max length: 255	Category to which this item belongs (e.g. Cooking Books, Drama); can be empty.
Description	No, unless features are present (but can be empty)	Any alphanumeric characters Max length: 4000	Description of this item.
Features list	No	Any alphanumeric characters Max length: 4000	Comma-separated list of feature-name=feature-value that can be used to enhance model recommendation. Feature names max length: 255 Feature-value max length: 255 Feature values should be categorical.

The request body should contain a file containing one line per item that will be updated.

Example without features

AAA04294,Office Language Pack Online DwnLd,Office AAA04303,Minecraft Download Game,Games C9F00168,Kiruna Flip Cover,Accessories

Example with features

AAA04294,Office Language Pack Online DwnLd,Office,, softwaretype=productivity, compatibility=Windows BAB04303,Minecraft DwnLd,Games,, softwaretype=gaming, compatibility=iOS, agegroup=all C9F00168,Kiruna Flip Cover,Accessories,, compatibility=lumia, hardwaretype=mobile

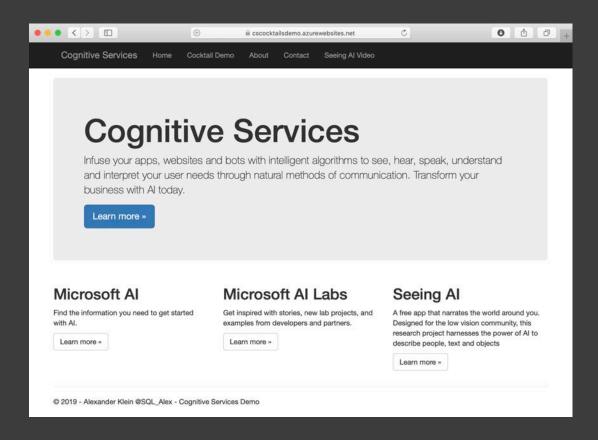
Recommendations usage file

Name	Mandatory	Туре	Description
User Id	Yes	[A-z], [a-z], [0-9], [_] (Underscore), [-] (Dash) Max length: 255	Unique identifier of a user.
ltem Id	Yes	[A-z], [a-z], [0-9], [_] (Underscore), [-] (Dash) Max length: 50	Unique identifier of an item.
Time		Date in format: YYYY-MM- DDTHH:MM:SS (e.g. 2013-06-20T10:00:00)	Transaction time.
Event		One of the following: - Click - RecommendationClick - AddShopCart - RemoveShopCart - Purchase	The type of transaction. If no usage event is defined, Purchase will be assumed.

Example

168064,6485200,2013/06/20T10:00:00, Purchase 263325,6485200,2013/06/20T10:00:00, Purchase 190485,6485200,2013/06/20T10:00:00, Click 225087,6485936,2013/06/20T10:00:00, Purchase

Cocktail recommendation Demo



What's next?

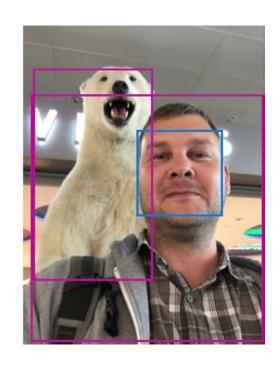
- Video Indexer
- Custom Vision
- Speaker Recognition
- LUIS
- Combination of 2 or more API's
- •

Question? Question!

Thank you for your attention



- **E** @SQL_Alex
- consulting-bi.de



Appendix

Cognitive Services SDK speech

https://github.com/Azure-Samples/cognitive-services-speech-sdk

Cognitive Services SDK Vision

https://github.com/Microsoft/Cognitive-Vision-Windows

Sketch2Code Custom Vision

https://azure.microsoft.com/de-de/blog/turn-your-whiteboard-sketches-to-working-code-in-seconds-with-sketch2code/

What's new in LUIS

https://channel9.msdn.com/Shows/AI-Show/Whats-New-with-Language-Understanding-Service-LUIS

What's new in Vision

https://channel9.msdn.com/Shows/AI-Show/Vision-Cognitive-Services-Updates

Appendix

Cognitive Services

https://azure.microsoft.com/de-de/services/cognitive-services/

Seeing Al Prototype

https://www.youtube.com/watch?v=R2mC-NUAmMk&index=6&list=PLD7HFcN7LXRdHkFBFu4stPPeWJcQ0VFLx

Seeing Al

http://SeeingAl.com

Keynote Cogntive Services Build 2017

https://www.youtube.com/watch?v=TU5KIYa4mBQ

Cogntive Services with camereas

https://www.youtube.com/watch?v=O1pDOkzsFOU

Computer Vision API detail information

https://www.microsoft.com/en-us/research/publication/rich-image-captioning-in-the-wild/