

Microsoft Cognitive Services: AI for everyone?

Alexander Klein
Twitter: [@SQL_Alex](https://twitter.com/SQL_Alex)



Documentation · Data Lineage · Change Tracking · Backup



DATAmasterminds



HEDDA.IO



SQLSaturday #880 - Munich

19.10.2019



SQLSATURDAY
*PASS



Who am I?

Independent BI Consultant

> 15 years experience of SQL Server

Focus on MS Azure & AI & BI Stack

✉ a.klein@consulting-bi.de

🐦 @SQL_Alex

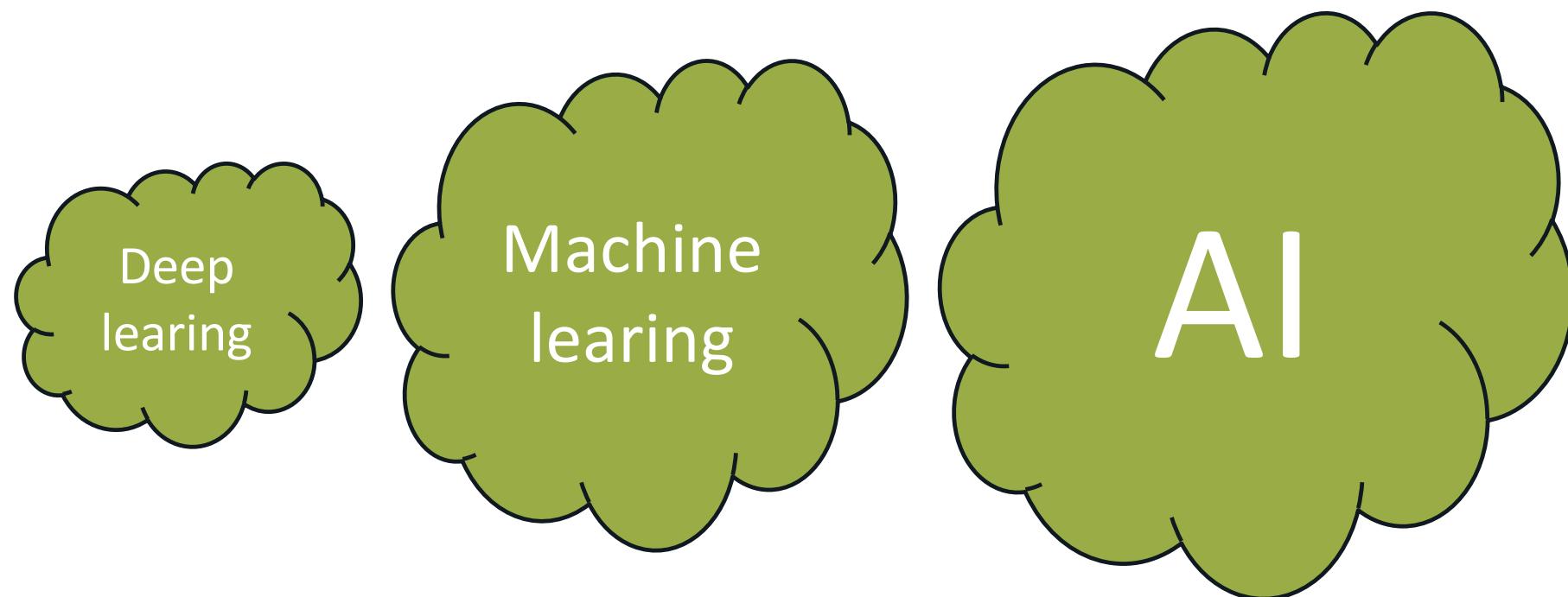
🏡 consulting-bi.de



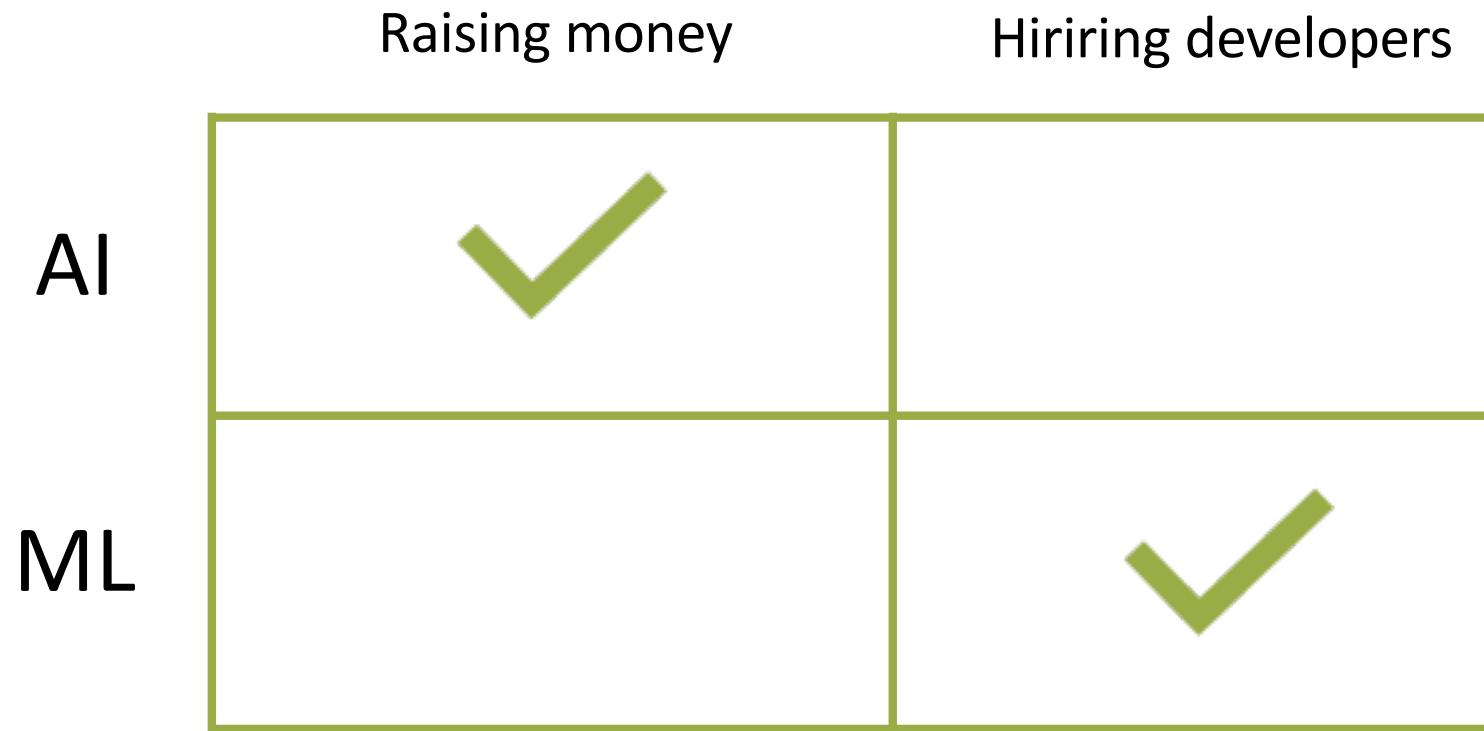
Next 75 Minutes

- Cognitive Services
- Computer Vision
- Custom Vision
- Text Analytics
- Sketch 2 Code
- #SQLKellner
- What's next?

Deep learning, machine learning and AI

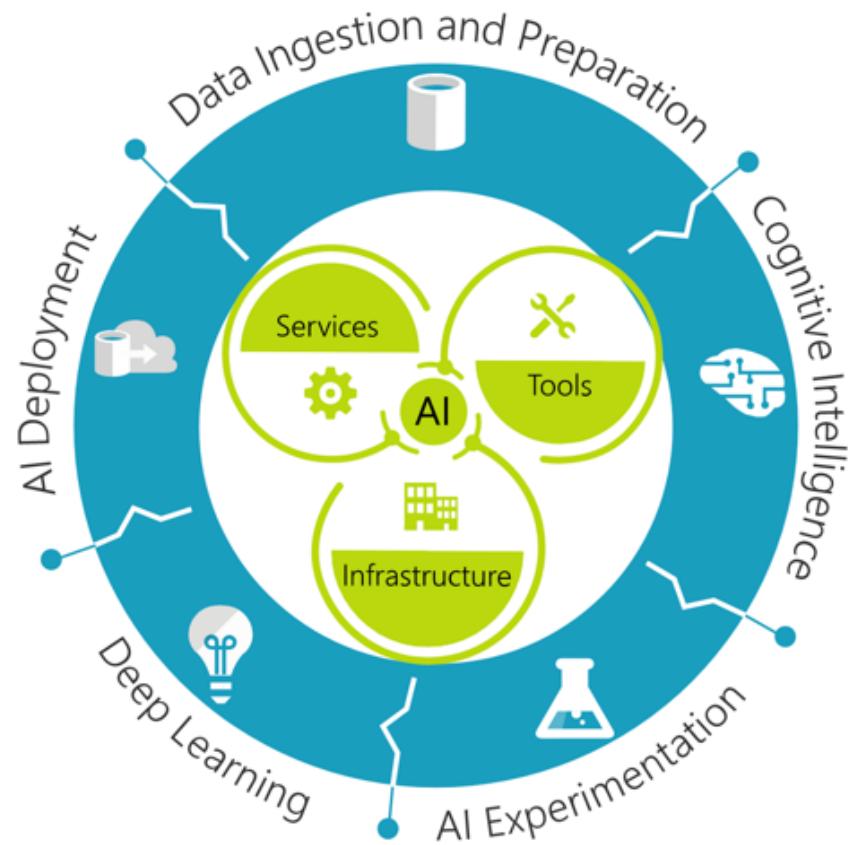


AI .. ML ?



Microsoft AI platform

Use a comprehensive set of flexible [AI services](#) for any scenario, and enterprise-grade [AI infrastructure](#) that runs AI workloads anywhere at scale. Modern [AI tools](#) designed for developers and data scientists help you create AI solutions easily, and with maximum productivity.



AI 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 AI. 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.

AI Infrastructure

AI 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 AI training

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



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.

AI on data

AI-enable your data platform



Data Lake Store

Run data transformations and AI on petabyte-scale.



SQL Database

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



Azure Cosmos DB

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

AI Tools



Machine Learning Studio

Easily build, deploy, and manage predictive analytics solutions



Azure Machine Learning Workbench

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



Visual Studio Code Tools for AI

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.

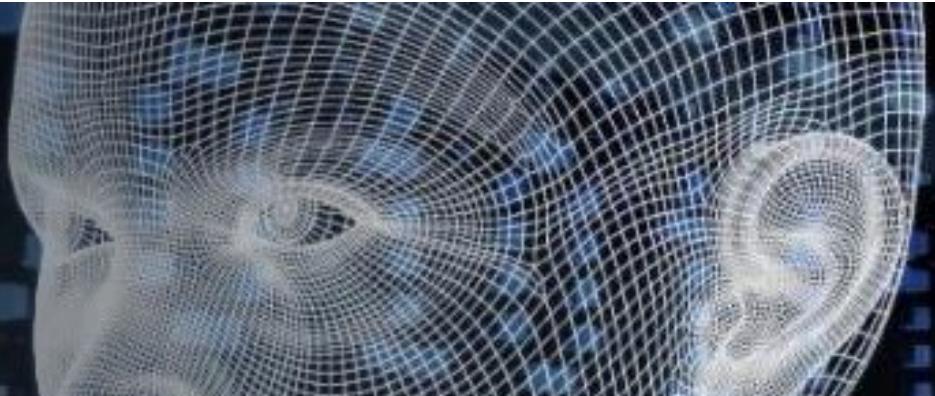


AI Toolkit for Azure IoT Edge

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

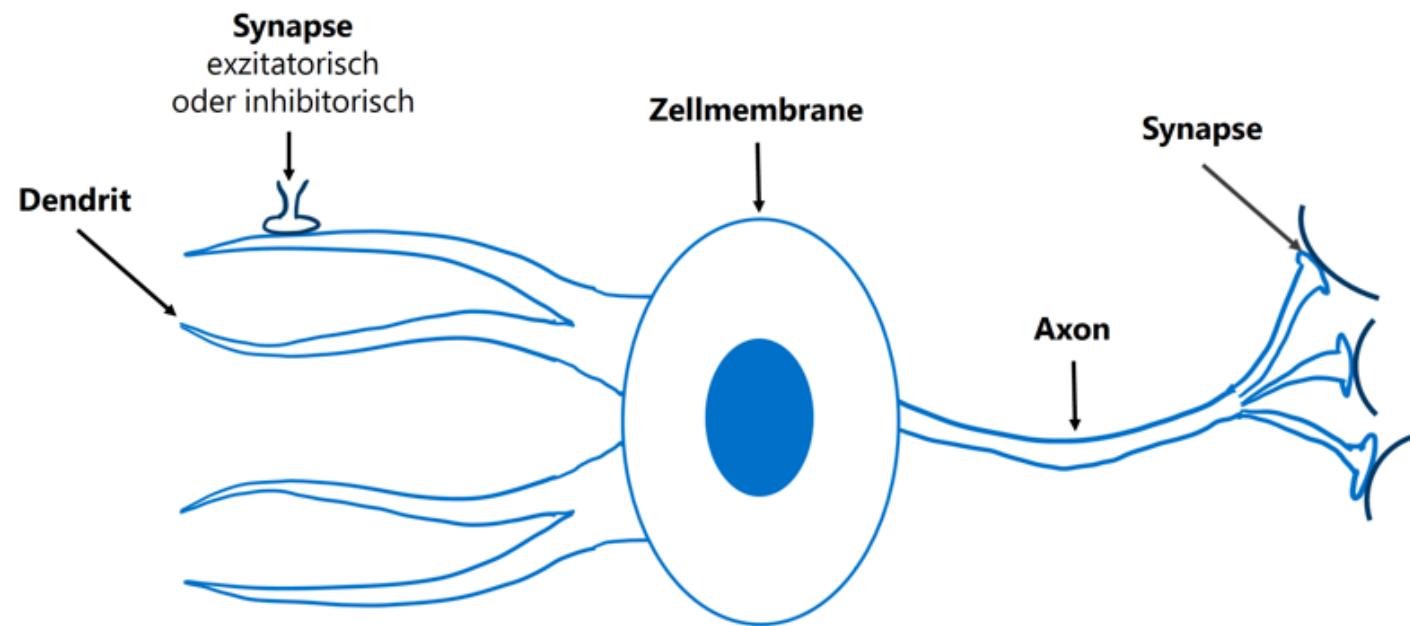
Microsoft Cognitive Services

Basic elements

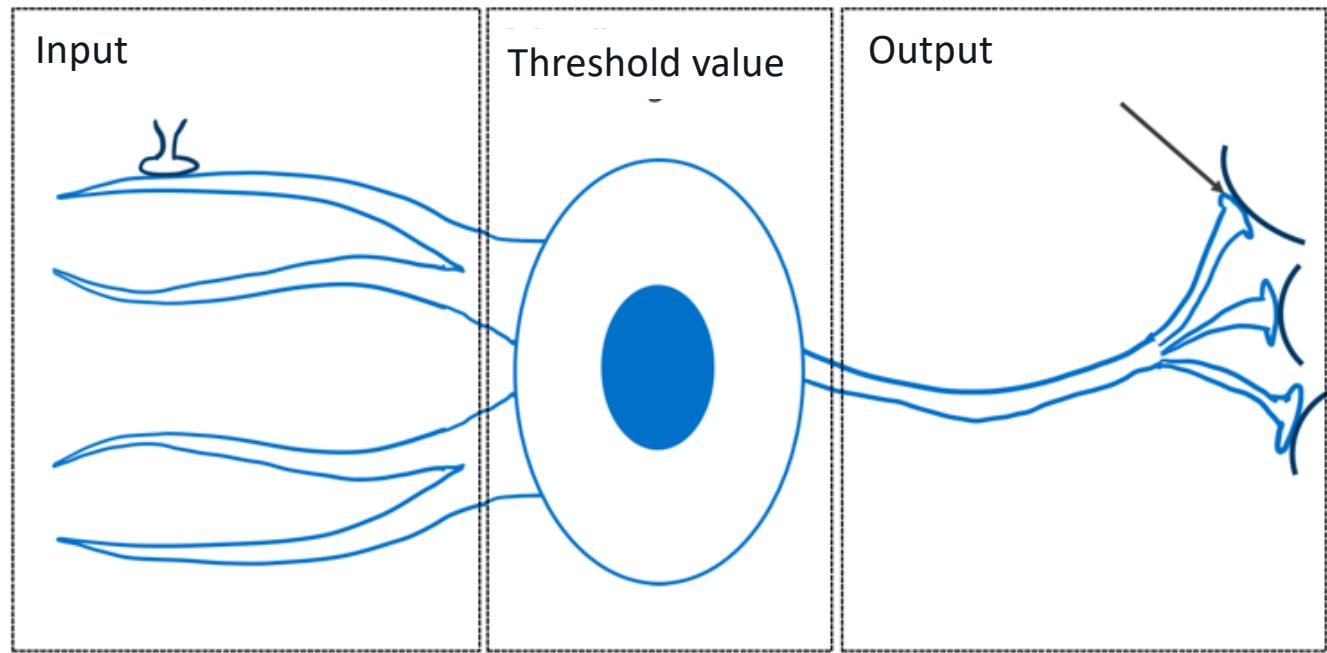


Microsoft Cognitive Services

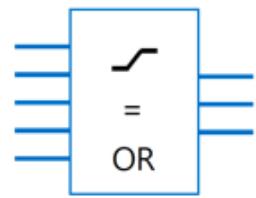
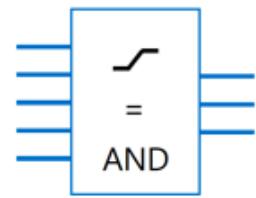
Basic elements



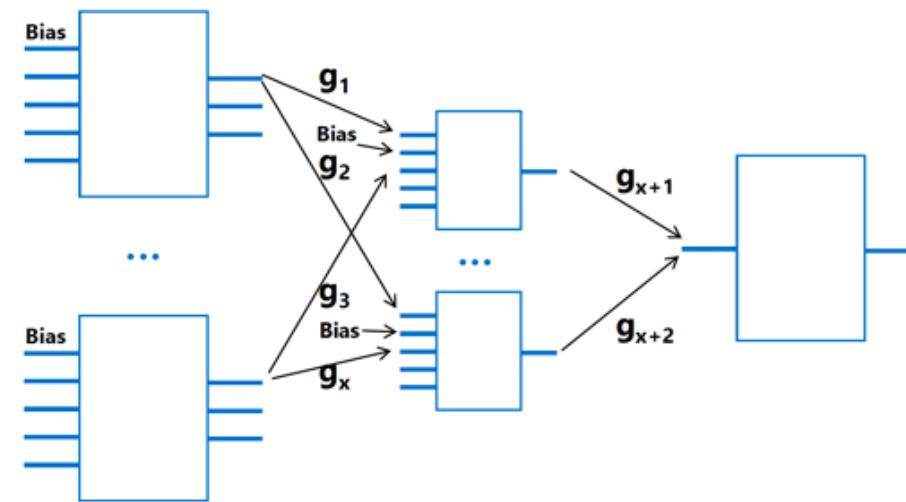
Microsoft Cognitive Services



Microsoft Cognitive Services



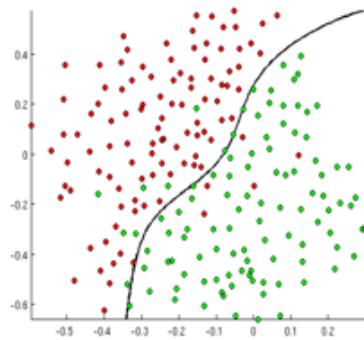
Single Layer



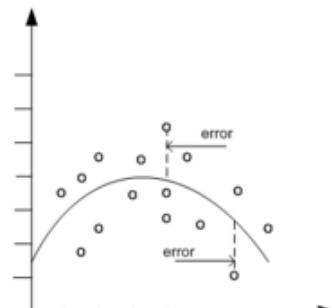
Multi-Layer

Microsoft Cognitive Services

Klassifizierung



Regression



Assoziation
& Matchbox

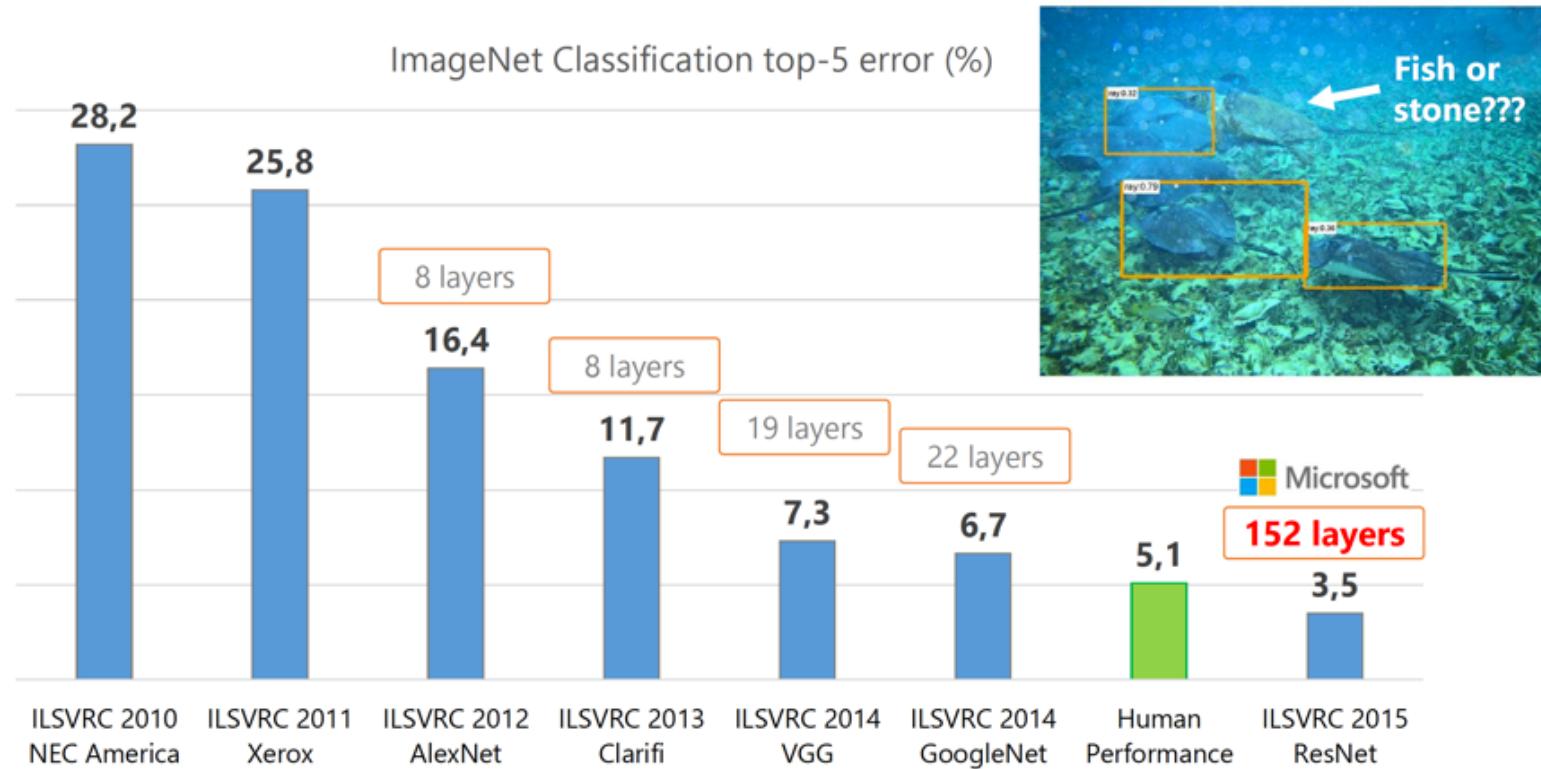


Clustering



Microsoft Cognitive Services

ImageNet Large Scale Visual Recognition Challenge (ILSVRC)



Microsoft Cognitive Services



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".

Internal Microsoft Azure

Microsoft Translator V1.00.23400.11102

Data Source: War and Peace

Translate to: English

War and Peace

Author: Leo Tolstoy

Language: Russian

Pages: 1,440

Novel by Russian author Tolstoy, originally titled *Война и мир*, considered one of finest literary achievements and a central work in world literature.

Azure Standard Server – 24-53N-1U

Type: 24-core 2.4 GHz Haswell

Model: 24-53245-NKD 1U

Peak Power/Unit: 300 Watts

Compute Capacity: 1.8 Tera-ops

Time Elapsed: 00:19.9

Pages Translated: 1440

Pages Per Second: 73

TRANSLATE

Azure FPGA Server – SV4-D5-1U

Type: 10 CPU cores + 4 FPGAs

Model: Stratix V D5-accelerator

Peak Power/Unit: 240 Watts

Compute Capacity: 7.9 Tera-ops

Time Elapsed: 00:02.6

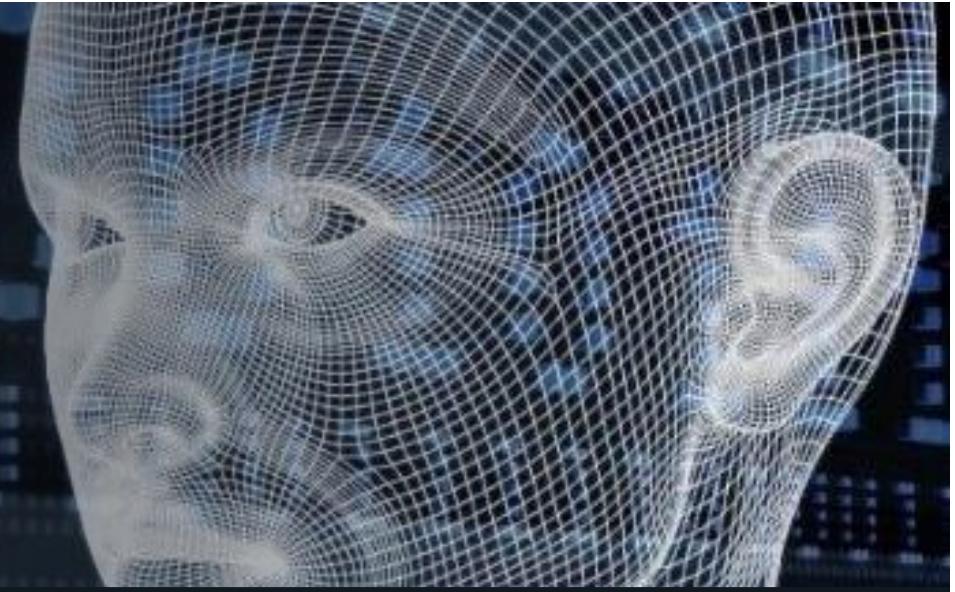
Pages Translated: 1440

Pages Per Second: 558

TRANSLATE

Microsoft Cognitive Services

Give your apps a human side



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>

Microsoft Cognitive Services

Give your apps a human side



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 decision-making.

Search

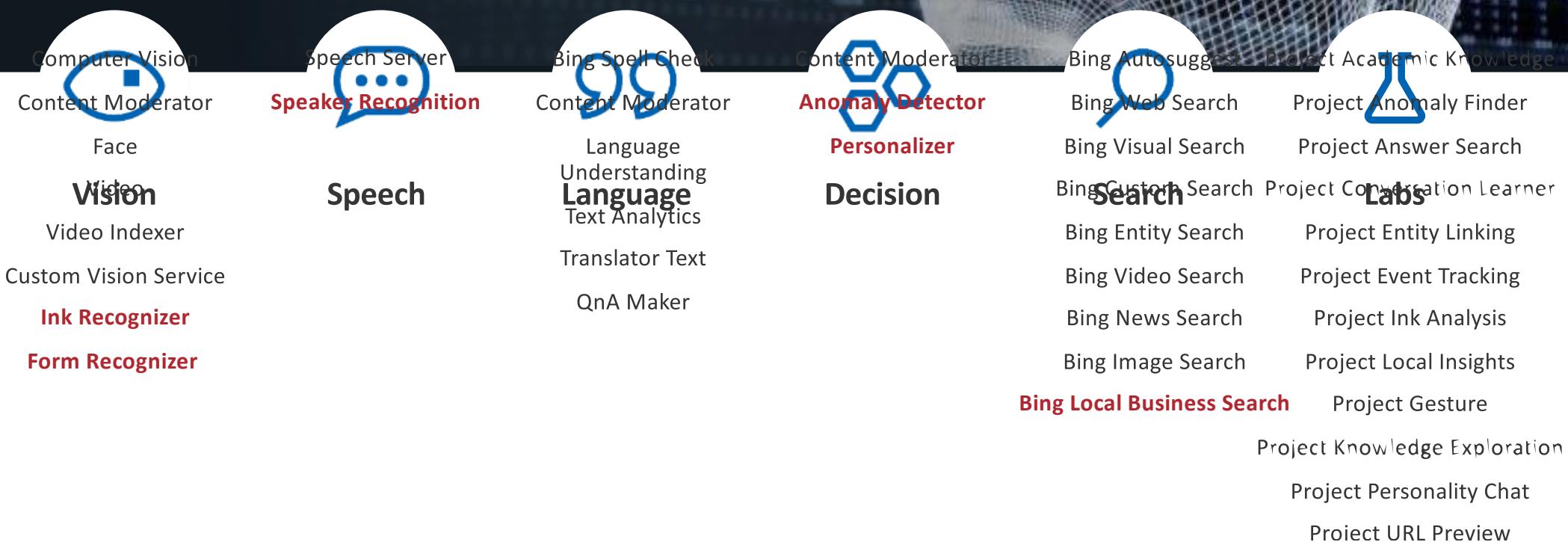
Access billions of web pages, images, videos, and news with the power of Bing APIs

Labs

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

Microsoft Cognitive Services

Give your apps a human side



Microsoft Cognitive Services

Give your apps a human side



Vision

Computer Vision
Content Moderator
Face
Video
Video Indexer
Custom Vision Service
Ink Recognizer
Form Recognizer
CUSTOMIZATION

Speech

Speech Server
Speaker Recognition

Language

Bing Spell Check
Content Moderator
Language Understanding
Text Analytics
Translator Text
QnA Maker

Decision

Content Moderator
Anomaly Detector
Personalizer

Search

Bing Autosuggest
Bing Web Search
Bing Visual Search
Bing Custom Search
Bing Entity Search
Bing Video Search
Bing News Search
Bing Image Search
Bing Local Business Search
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

Labs

Custom Vision Service

Custom Speech Service

Language Understanding

Custom Decision Service

Bing Custom Search

Vision



Computer Vision

[Try for free](#) | [Learn more](#)

Image classification

Scene and activity recognition in images | [Demo](#)

Celebrity and landmark recognition in images | [Demo](#)

Optical character recognition (OCR) in images | [Demo](#) | [Container Support](#)

Handwriting recognition | [Demo](#)



Face

[Try for free](#) | [Learn more](#) | [Container Support](#)

Face detection in images | [Demo](#)

Person Identification in images

Emotion recognition in images | [Demo](#)

Similar face recognition and grouping in images | [Demo](#)



Ink Recognizer PREVIEW

[Try for free](#) | [Learn more](#)

Recognize digital ink and handwriting

Recognize and pinpoint common shapes

Enable productivity scenarios



Video Indexer

[Try for free](#) | [Learn more](#)

Face detection in video

Object, scene, and activity detection in video

Metadata, audio, and keyframe extraction and analysis



Custom Vision

[Try for free](#) | [Learn more](#)

Customizable image recognition | [Demo](#)



Form Recognizer PREVIEW

[Learn more](#) | [Container Support](#)

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

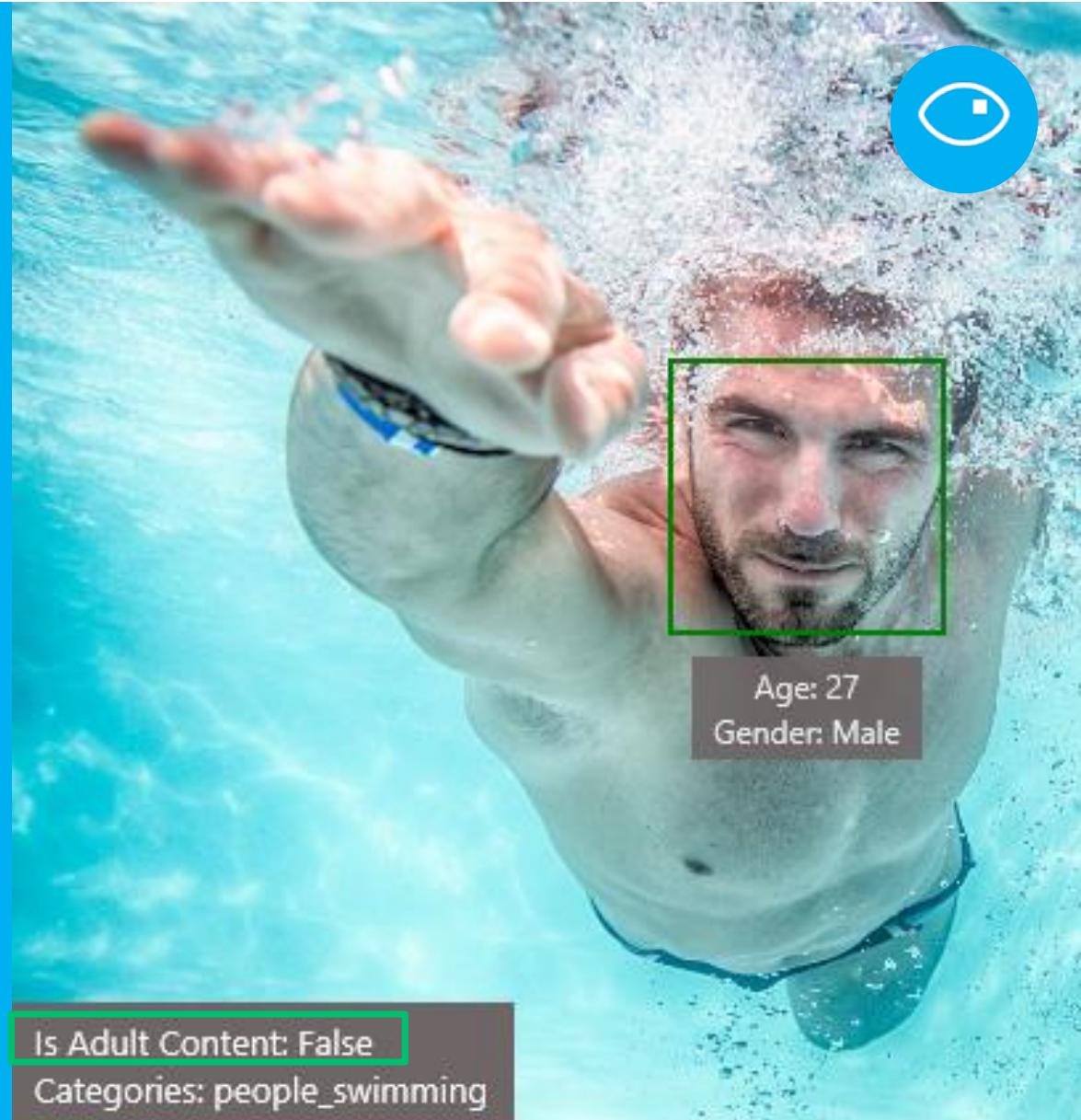
Clip Art Type	0 Non-clipart
Line Drawing Type	0 Non-Line Drawing
Black & White Image	False

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

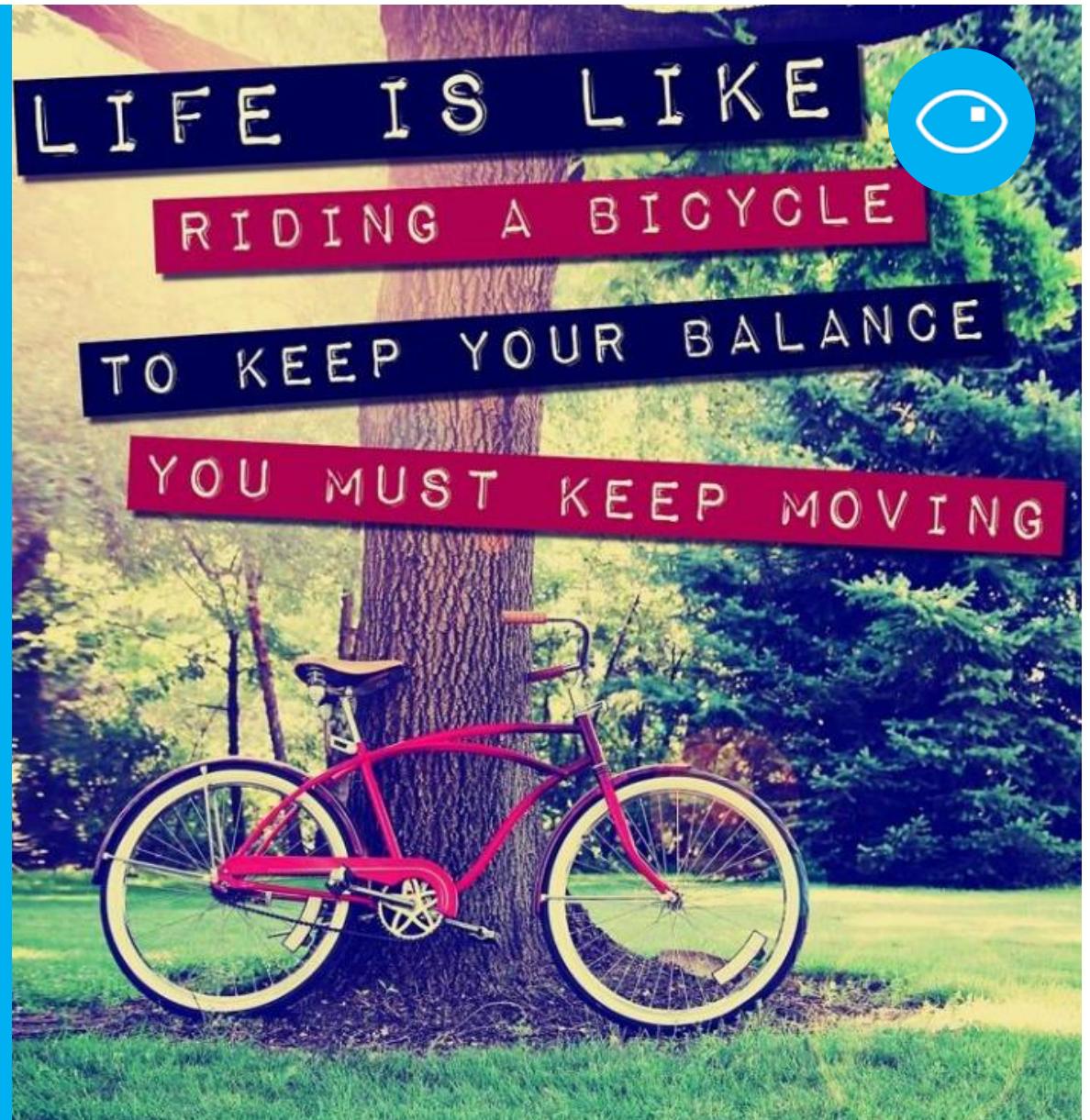
Dominant Color Background	White
Dominant Color Foreground	Grey
Dominant Colors	White
Accent Color	



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"  
            }  
          ]...  
        ]...  
      ]...  
    ]...  
  ]...  
}
```



Face API

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

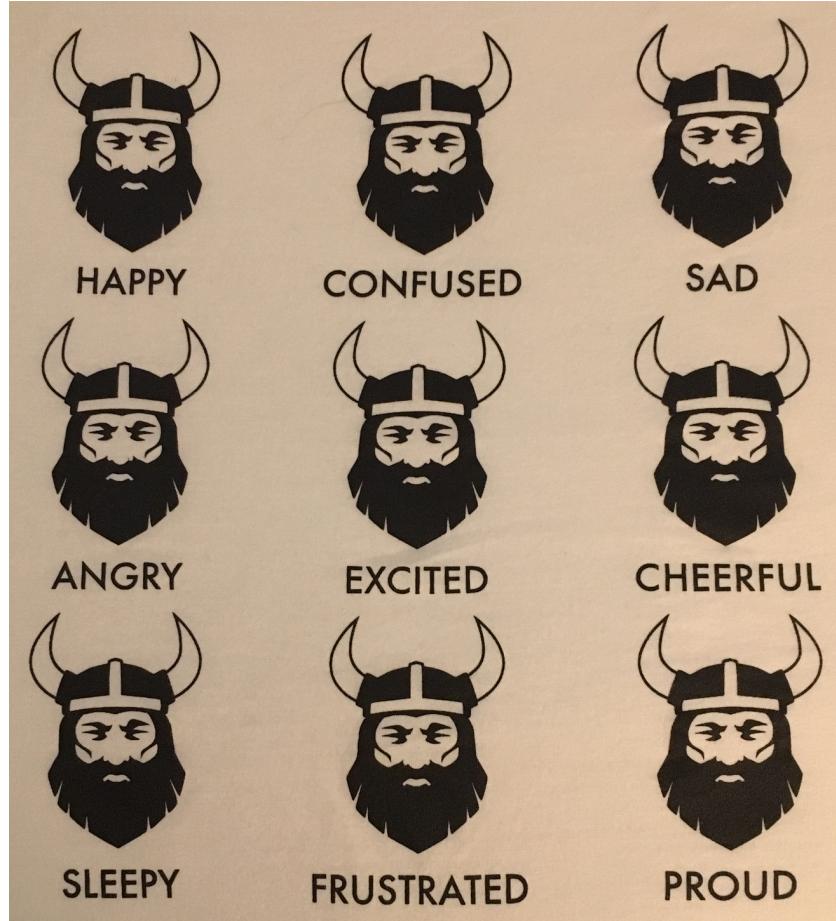
Search which person a face belongs to

Emotion recognition

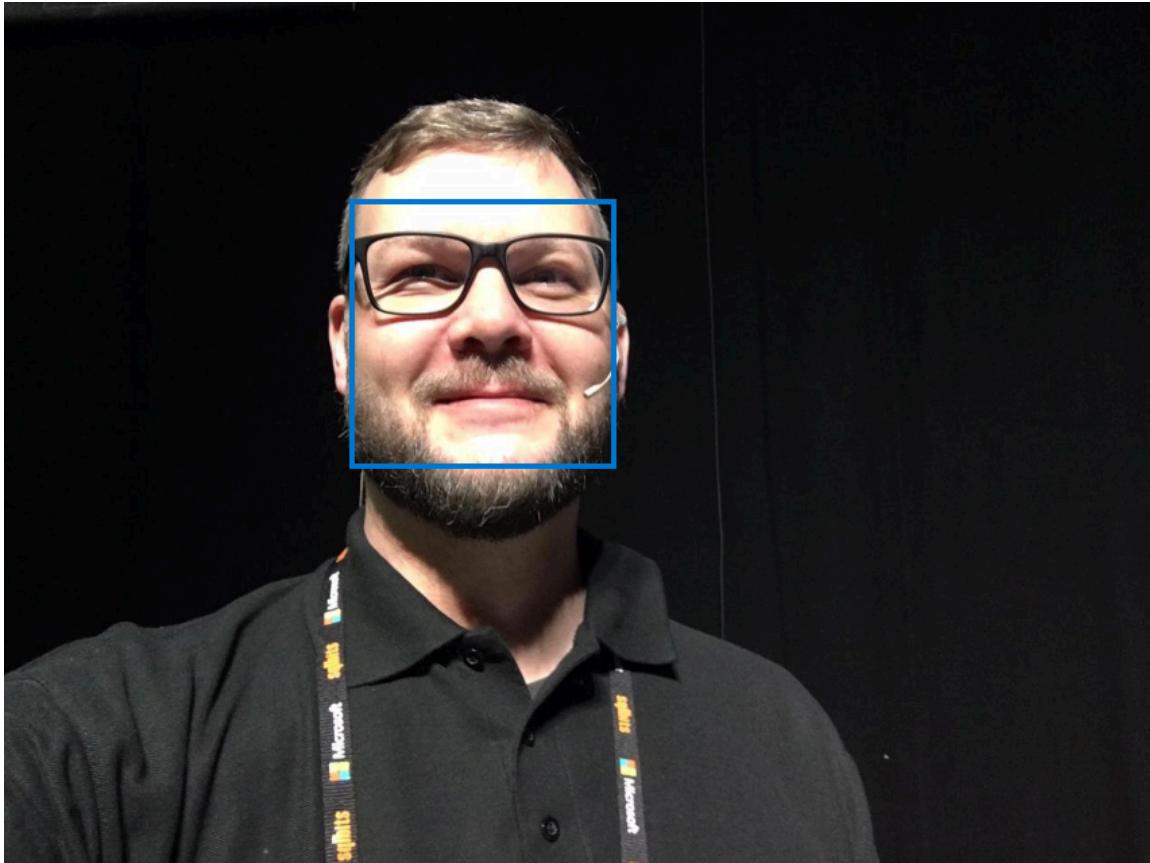
Recognition emotions in faces



Emotionen



Emotionen Face API



```
},
  "glasses": "ReadingGlasses",
  "makeup": {
    "eyeMakeup": false,
    "lipMakeup": false
  },
  "emotion": {
    "anger": 0.0,
    "contempt": 0.002,
    "disgust": 0.0,
    "fear": 0.0,
    "happiness": 0.959,
    "neutral": 0.038,
    "sadness": 0.0,
    "surprise": 0.0
  },
  "occlusion": {
    "foreheadOccluded": false,
    "eyeOccluded": false,
    "mouthOccluded": false
  },
  "accessories": [
    {
      "type": "glasses",
      "confidence": 0.99
    }
  ],
  "blur": {
    "blurLevel": "low",
    "blurType": "face"
  }
}
```

Computer Vision Demo



Custom Vision Service

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

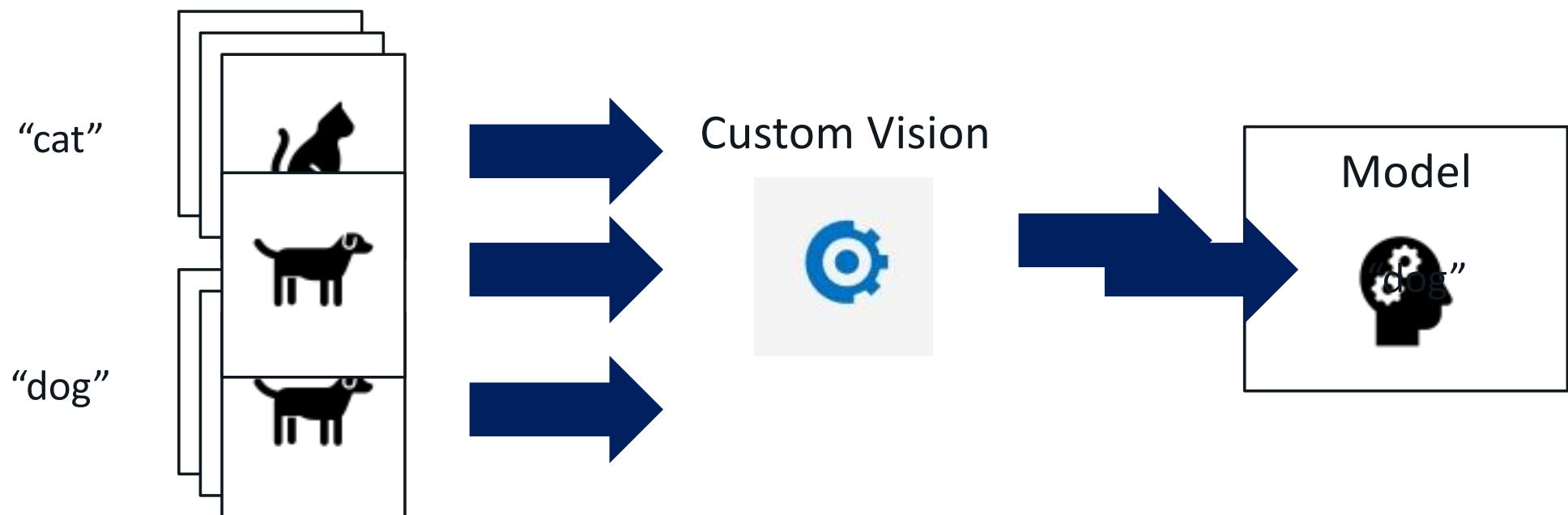
Use simple REST API calls to quickly tag images with your new custom computer vision model.

Active learning

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

What is it?

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



Custom Vision Demo

Text Analytics



Sentiment analysis

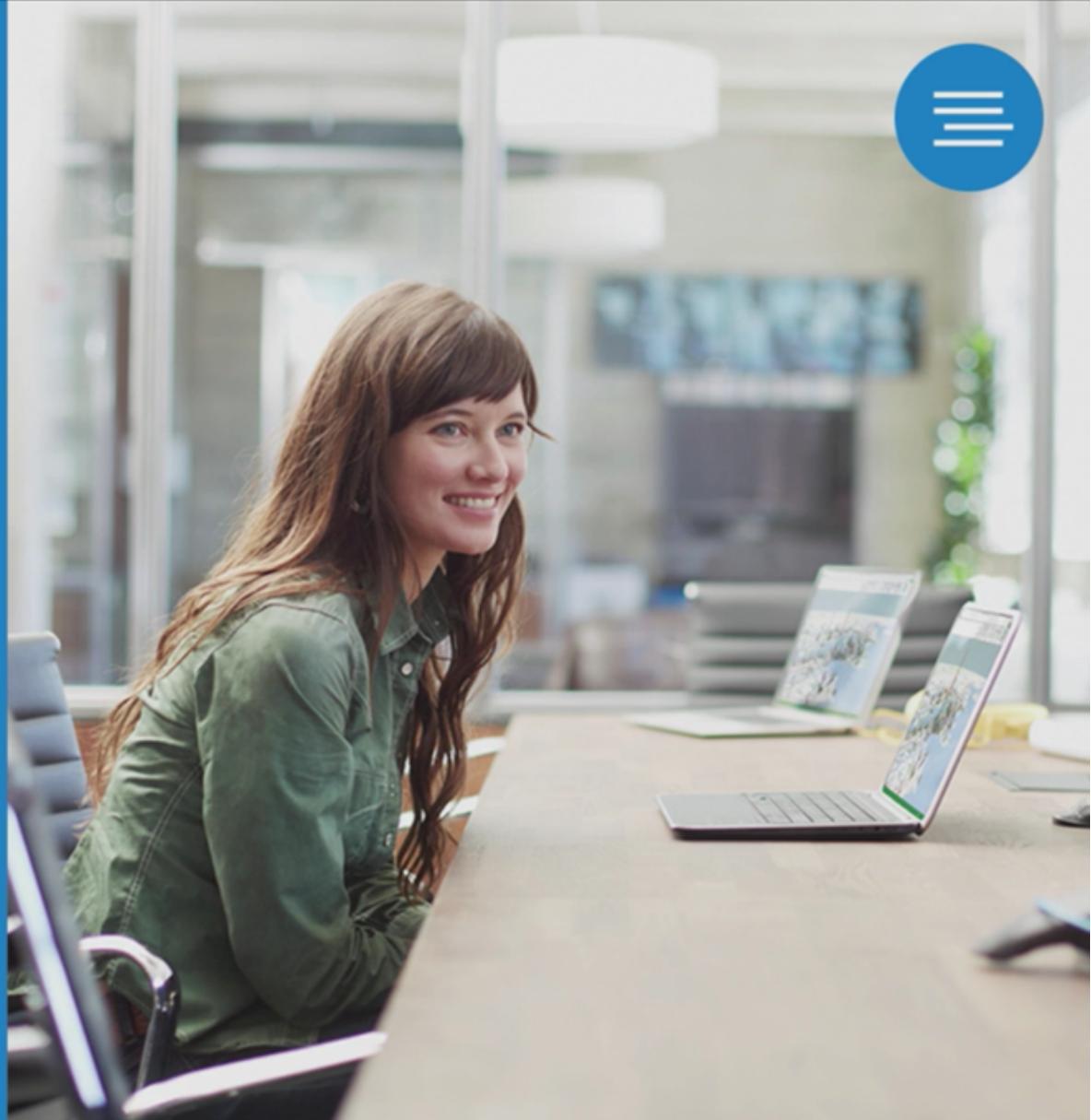
Understand if a record has positive or negative sentiment

Key phrase extraction

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

Language detection

Identify the language, 120 supported languages

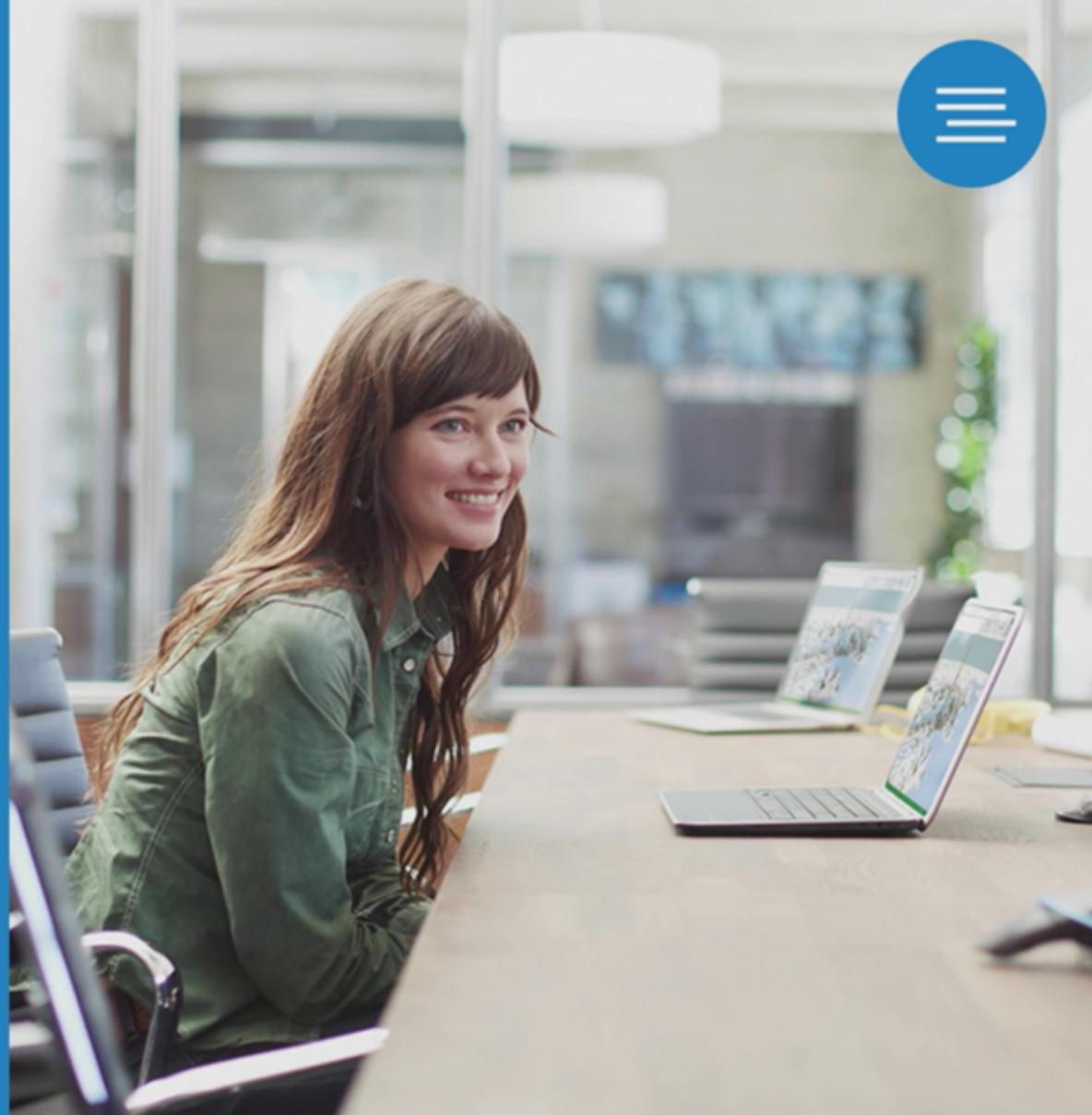


Text Analytics



Sentiment

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. English, French, Spanish and Portuguese text are supported.



Text Analytics Demo

Sketch 2 Code

Sketch 2 Code

The Need

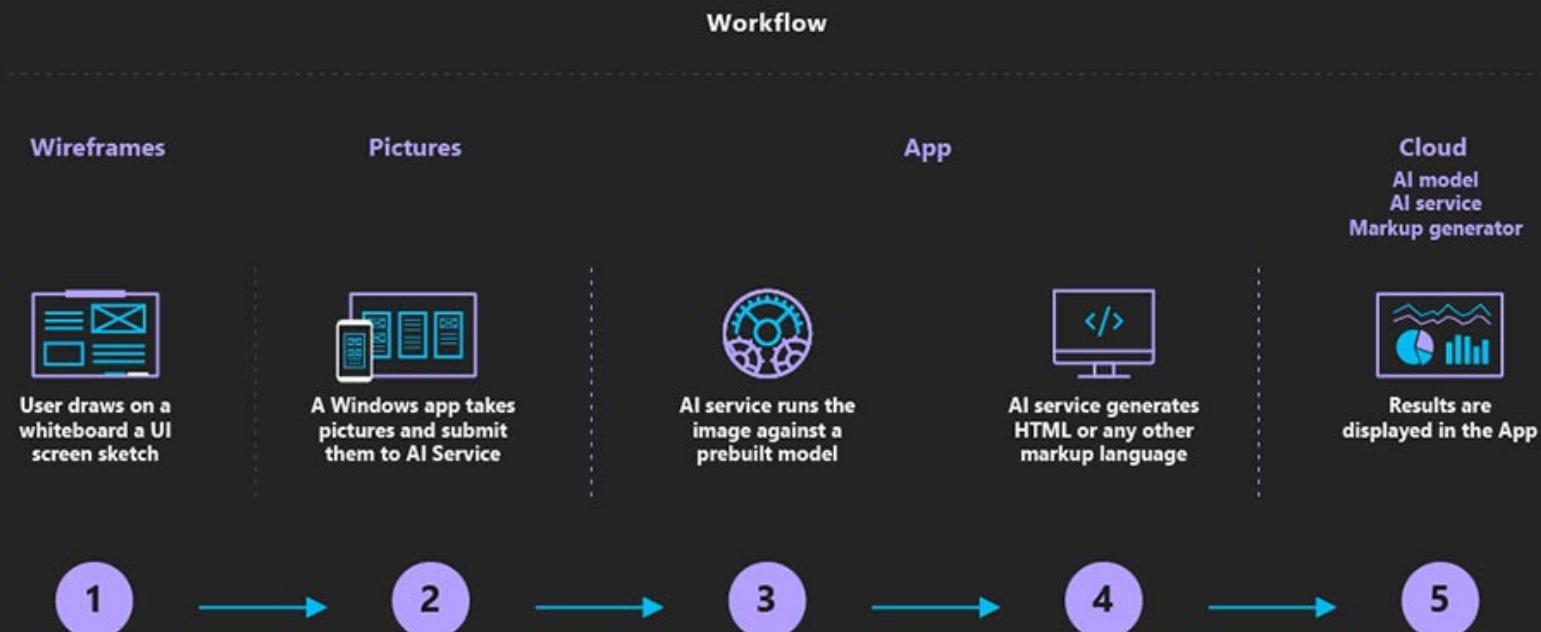
User Interface Design process involves a lot of creativity that starts on a whiteboard where designers share ideas. Once a design is drawn, it is usually captured within a photograph and manually translated into some working HTML wireframe to play with in a web browser. This takes effort and delays the design process.

Sketch 2 Code

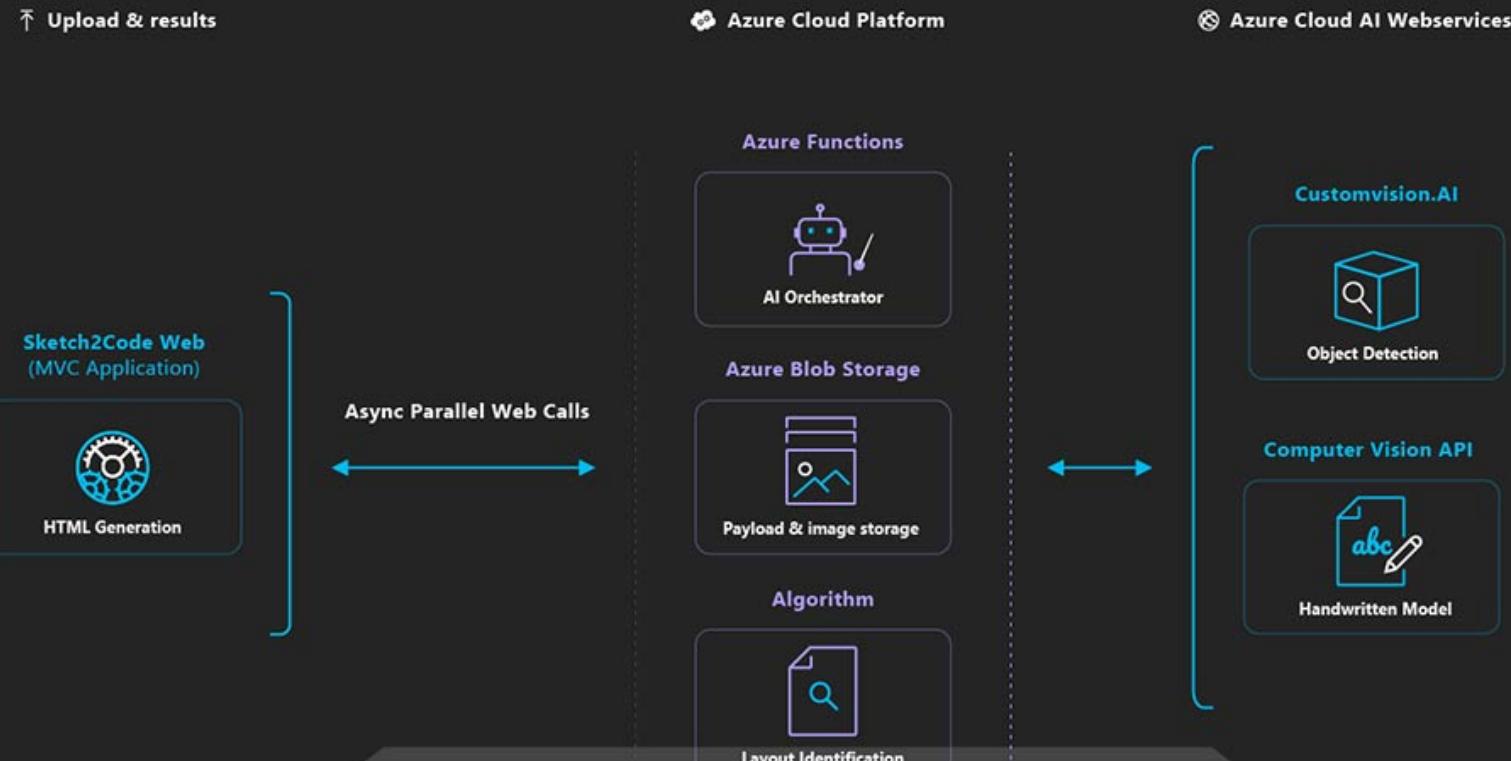
The Idea

Computer Vision is a discipline inside artificial intelligence that gives an application the capability to see and understand what it is seeing. We can use this technology to build a system that understands what a designer has drawn on a whiteboard and can translate that understanding to HTML code. This way we can generate HTML wireframes directly from a hand-drawn image giving an instant working design implementation thus streamlining the design process.

Sketch 2 Code



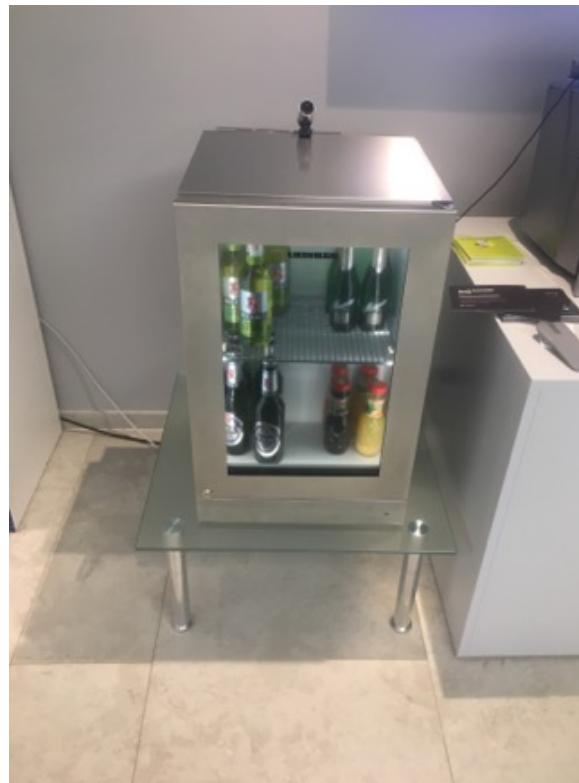
Sketch 2 Code



Sketch 2 Code Demo

Cognitive Services

Demo Microsoft



Cognitive Services

Demo Microsoft



Cognitive Services

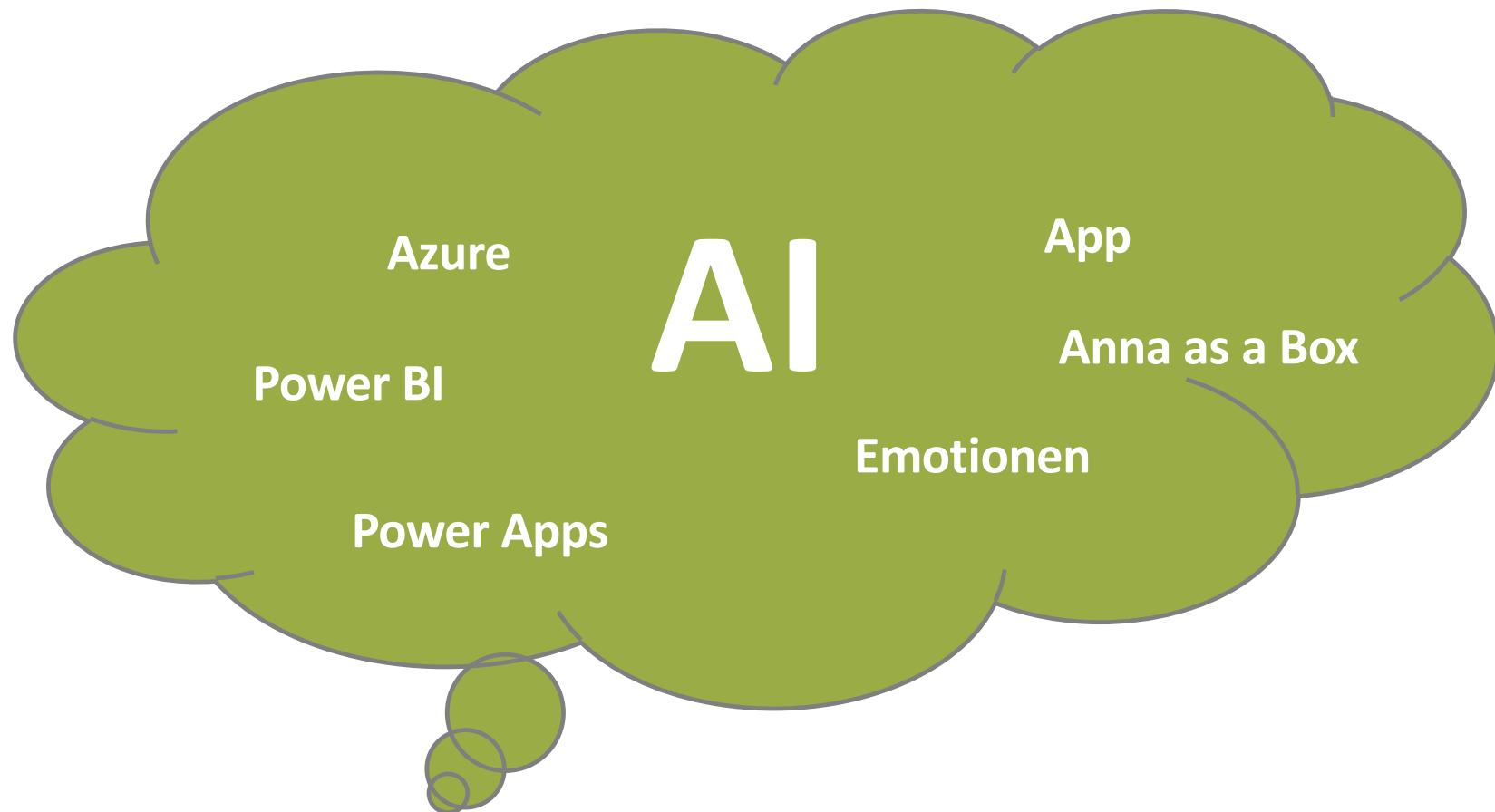
Demo Microsoft



Who is this SQLKellner?



Measuring service quality



Measuring service quality



Qualitäts Check #SQLKellner bei der #SQLKonferenz 2019

Aktion

- vor Service
- nach Service

Produkt

- Bier
- Nüsschen
- Nerdycorn-Swag

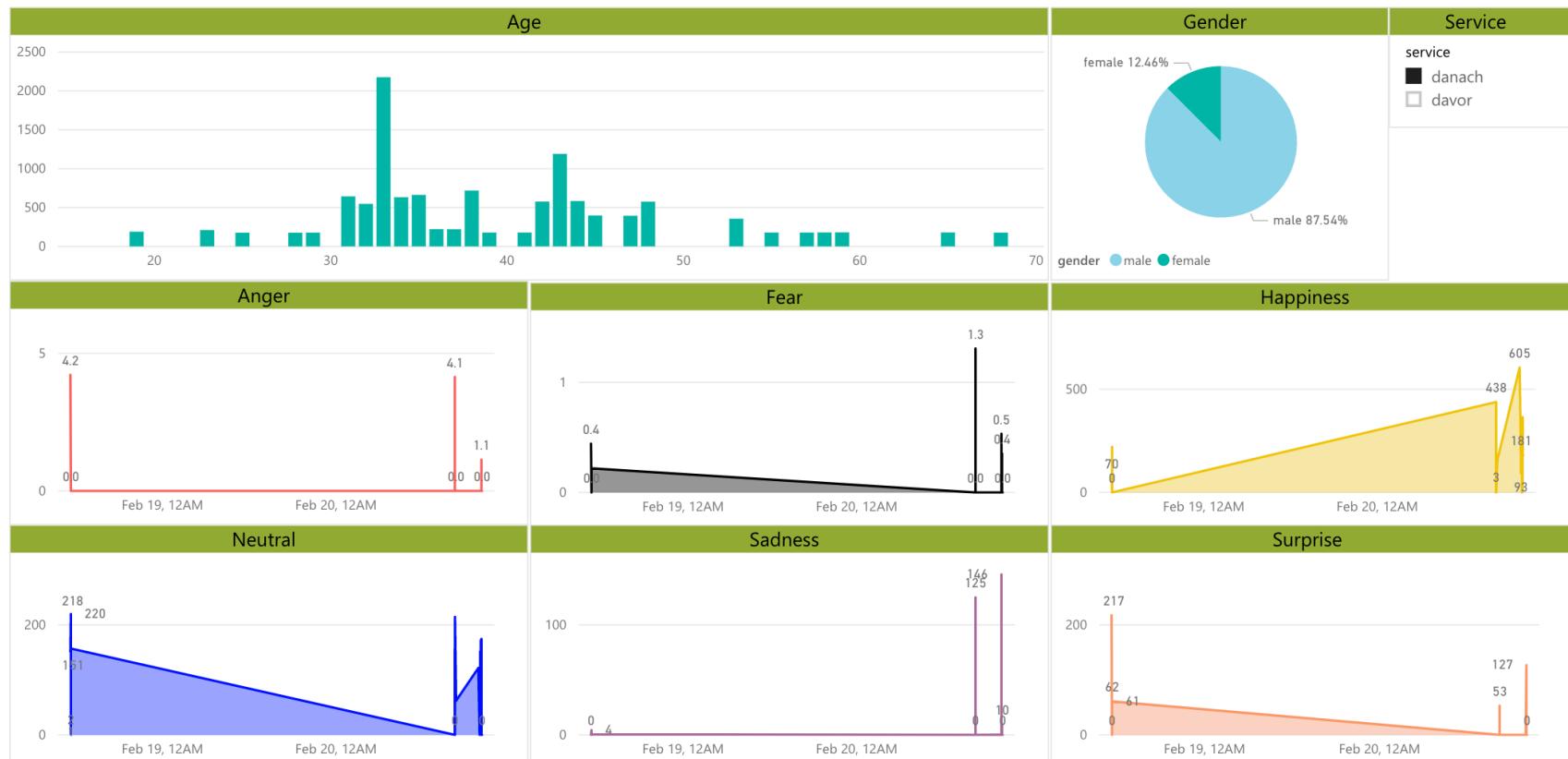
Äh was ist das?

a desk with a green light

Name	Gewissheit
Boor	0.973987638950...
indoor	0.925477206707...
green	0.880468189716...
table	0.880468189716...

Measuring service quality

#SQLKellner Check



SQL Kellner Demo



Contact Sales: 0800-6

Overview ▾ Solutions Products ▾ Documentation Pricing Training Marketplace ▾ Partners ▾ Support ▾ Blog

[Blog](#) / [Announcements](#)

Bringing AI to the edge

Posted on November 14, 2018



[Eric Boyd](#), Corporate Vice President, Azure AI



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

What's next?

- Video Indexer
- Speaker Recognition
- LUIS
- Combination of 2 or more API's
- Bots
- Translator in Power Point
- ...

Questions?

Alexander Klein

Twitter: [@SQL_Alex](https://twitter.com/SQL_Alex)

Tack för din uppmärksamhet



Alexander Klein

Twitter: [@SQL_Alex](https://twitter.com/SQL_Alex)

Session Feedback Day 2 (not optional!)

<http://bit.ly/DataGrillen2019Day2>



Event Feedback (not optional!)

<http://bit.ly/DataGrillen2019Event>



Appendix

Cognitive Services

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

Cognitive Services Docker Support

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

AI Demos

<https://aidemos.microsoft.com>

Seeing AI Prototype

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

Seeing AI

<http://SeeingAI.com>

Keynote Cognitive Services Build 2017

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

Cognitive Services with camereas

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

Appendix

Cognitive Services Docker Samples

<https://github.com/Azure-Samples/cognitive-services-containers-samples>

Cognitive Services in Power BI

<https://docs.microsoft.com/en-us/power-bi/service-cognitive-services>

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/>

Computer Vision API detail information

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

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>