

Alexander Klein



Playground of cognitive services

- Even big kids play here

Who am I?

Independent BI Consultant

> 15 years experience of SQL Server

Focus on Microsoft BI Stack & Azure

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🐦 @SQL_Alex

🏡 consulting-bi.de



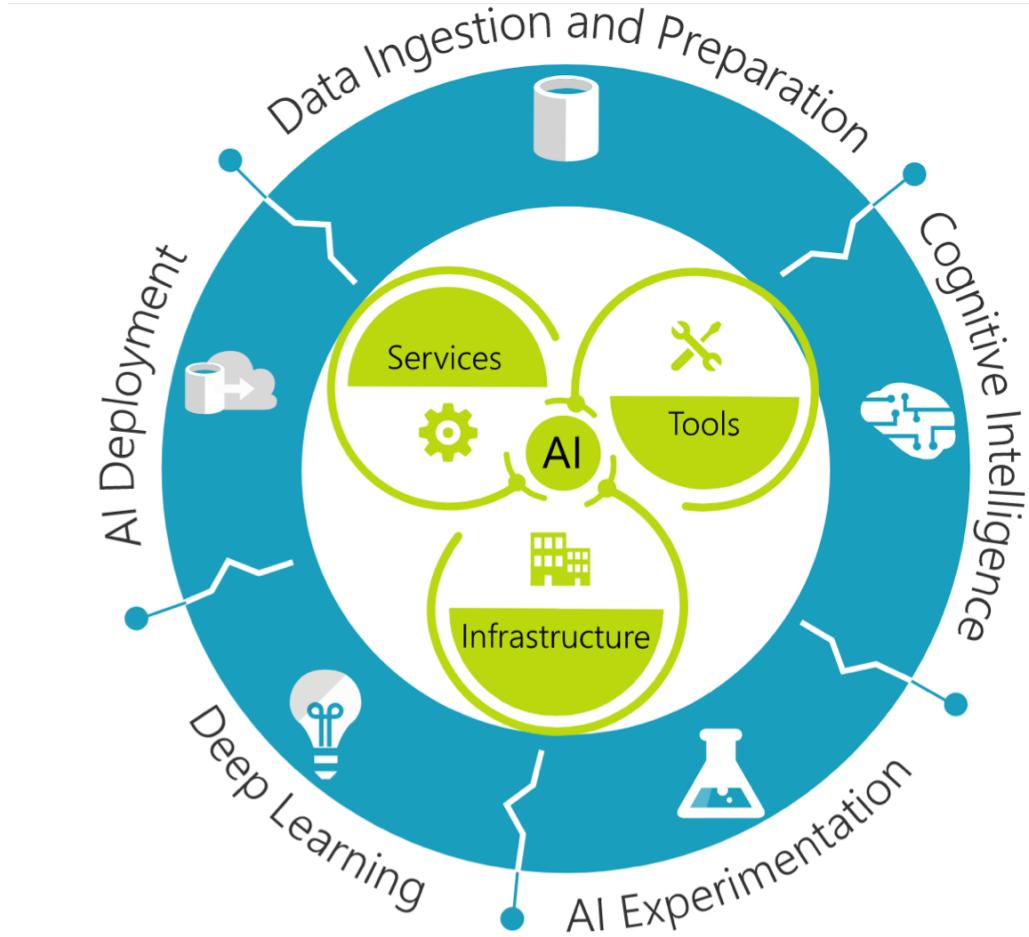
Next 90 Minutes

- Cognitive Services
- Face
- Emotion
- Computer Vision
- Text Analytics
- Recommendation
- Q&A Bots
- Favorite cocktail demo
- What's next?



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 services

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



Visual Studio Code Tools for AI

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



Other popular open source tools

Support for Jupyter Notebooks, PyCharm, and more.



Azure Machine Learning Workbench

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



Azure Notebooks

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



AI Toolkit for Azure IoT Edge

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



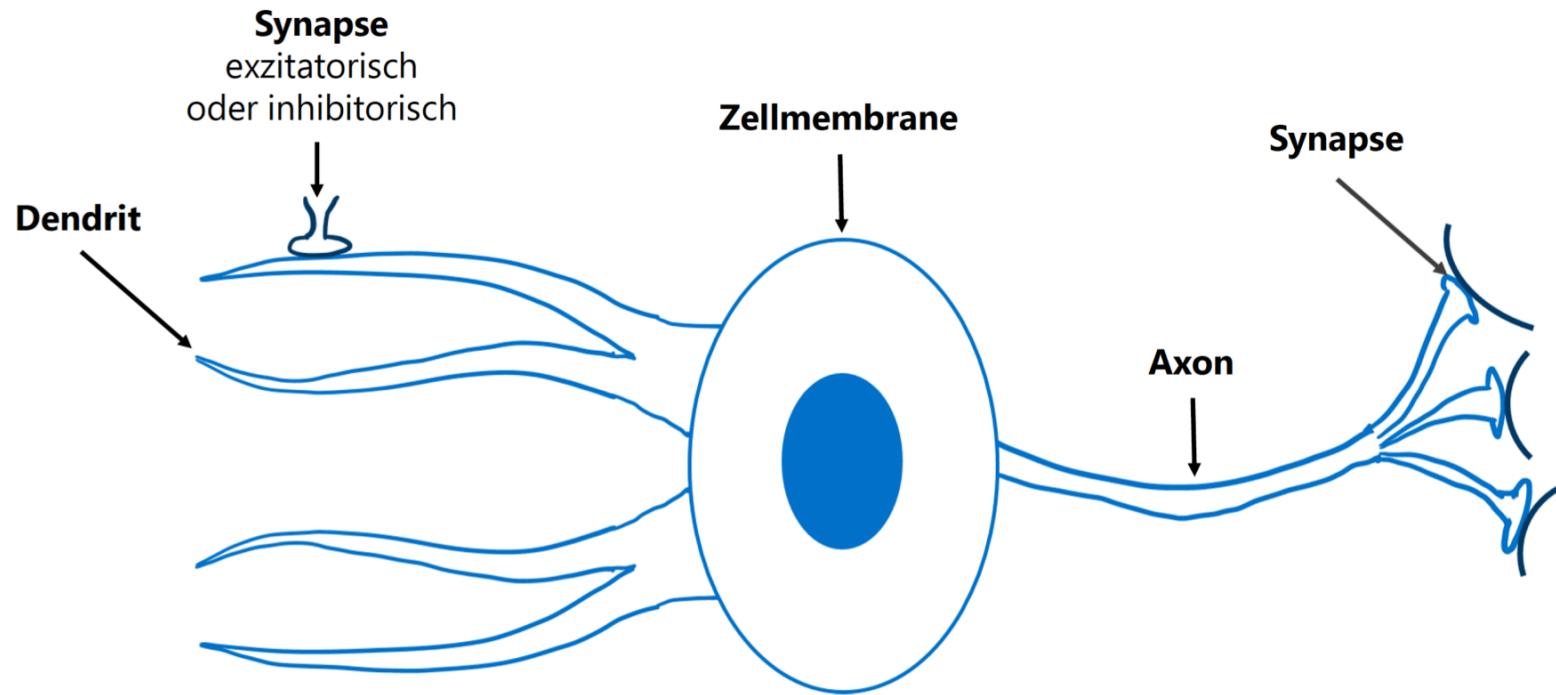
Cognitive Services

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 ...

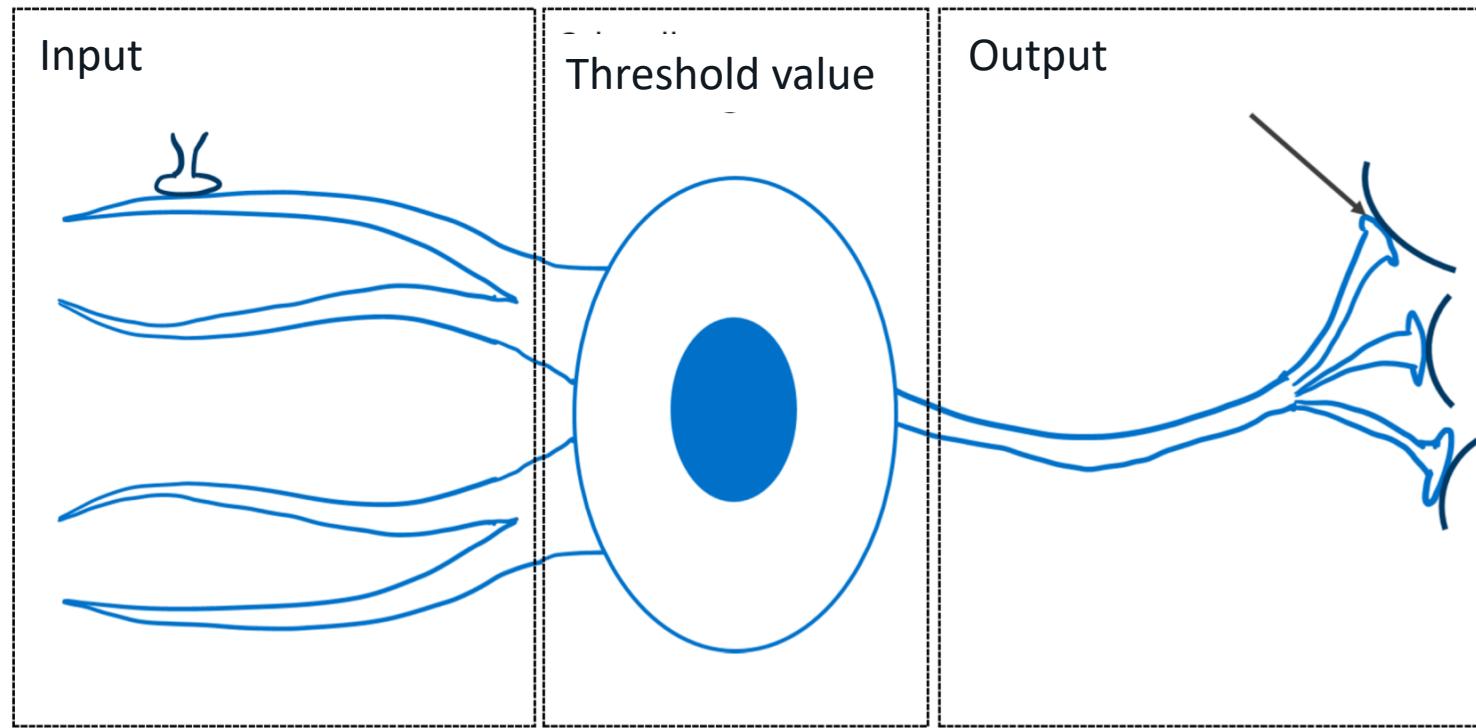
<https://docs.microsoft.com/en-us/azure/cognitive-services/welcome>



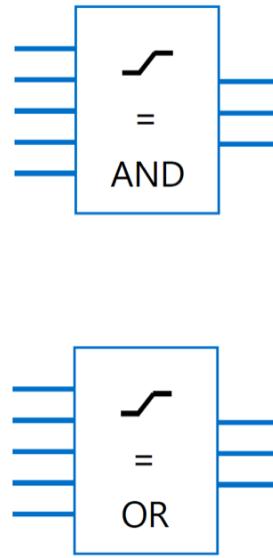
Cognitive Services



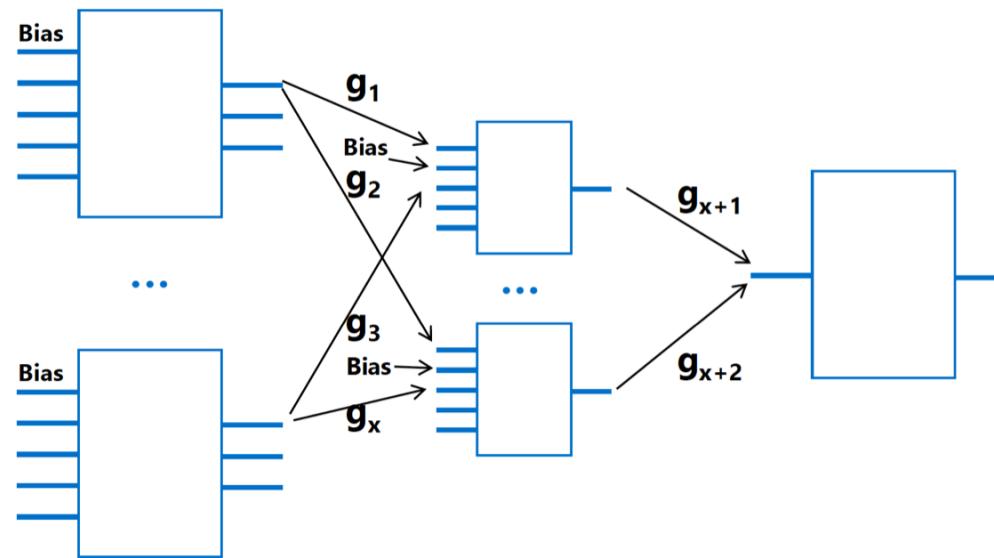
Cognitive Services



Cognitive Services



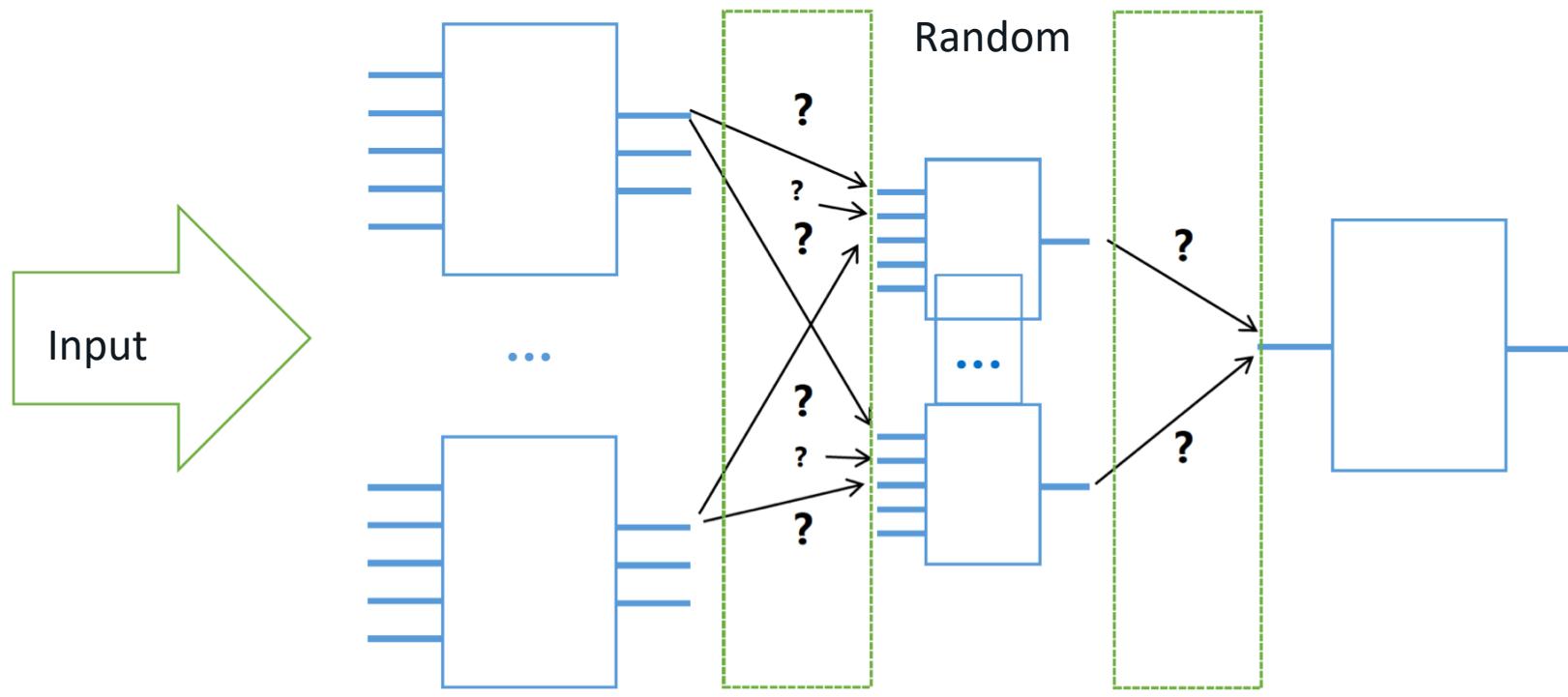
Single Layer



Multi-Layer

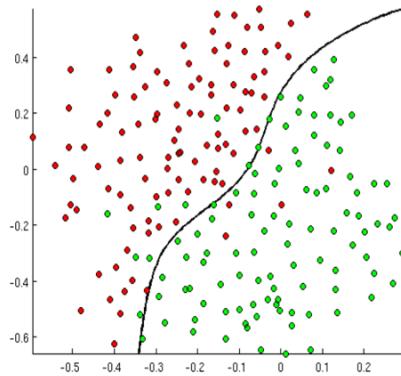


Cognitive Services

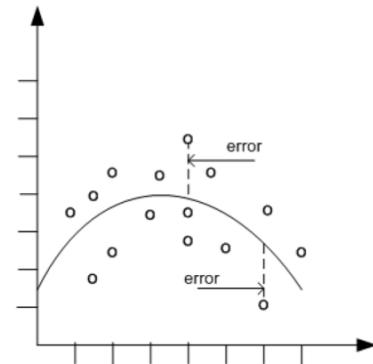


Cognitive Services

Klassifizierung



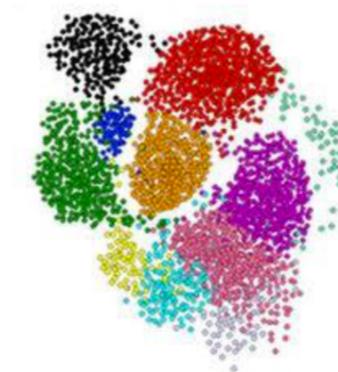
Regression



Assoziation
& Matchbox

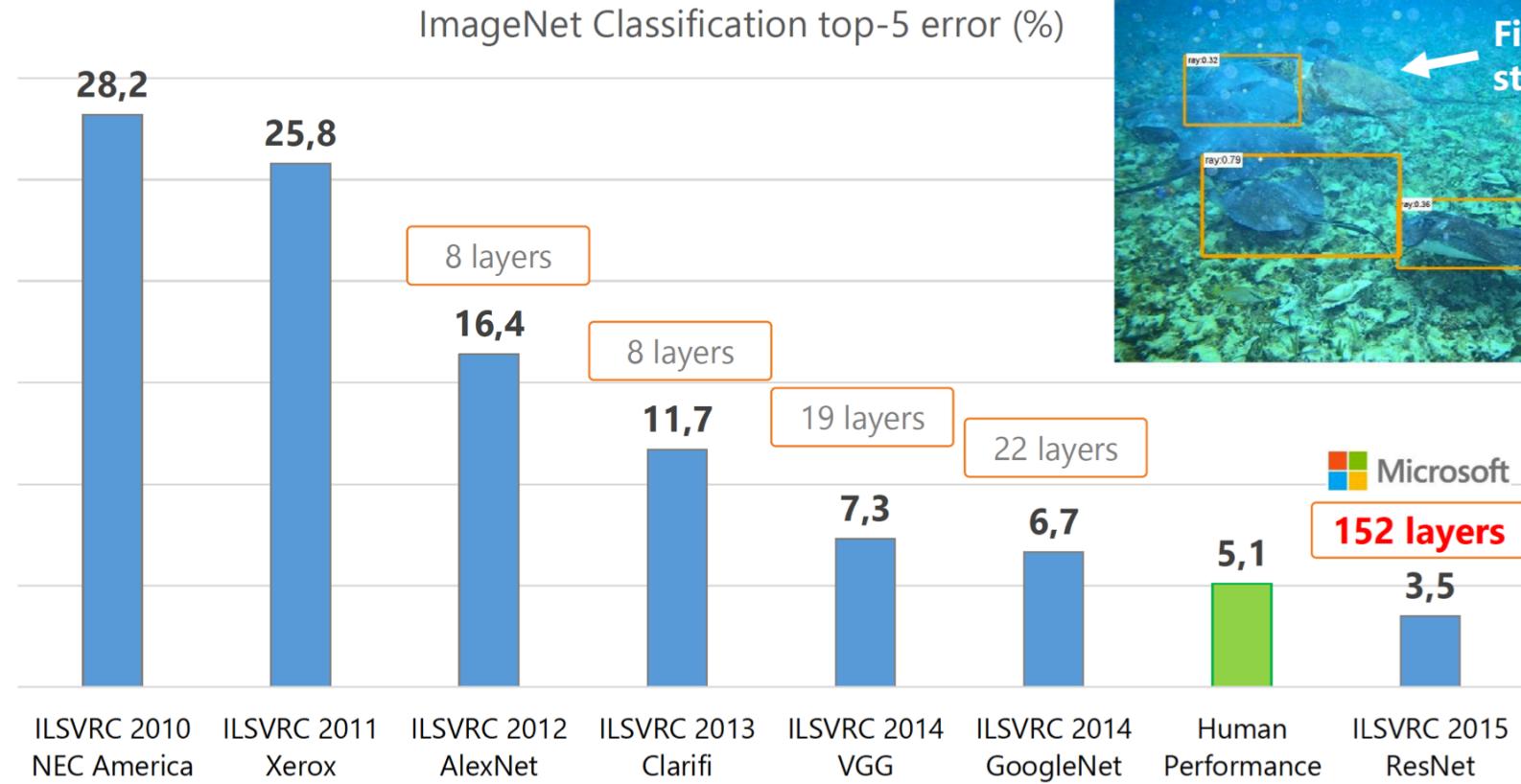


Clustering



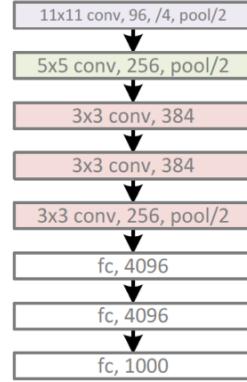
Cognitive Services

ImageNet Large Scale Visual Recognition Challenge (ILSVRC)

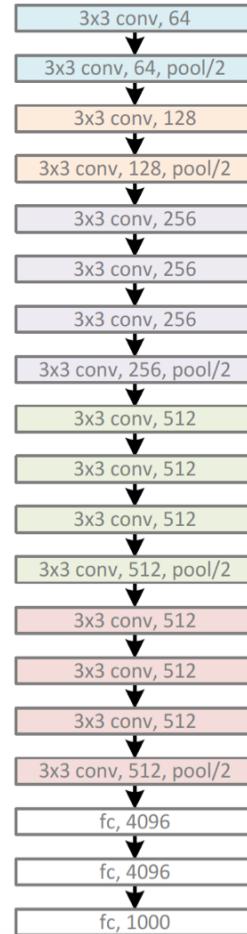


Cognitive Services

AlexNet, 8 layers
(ILSVRC 2012)



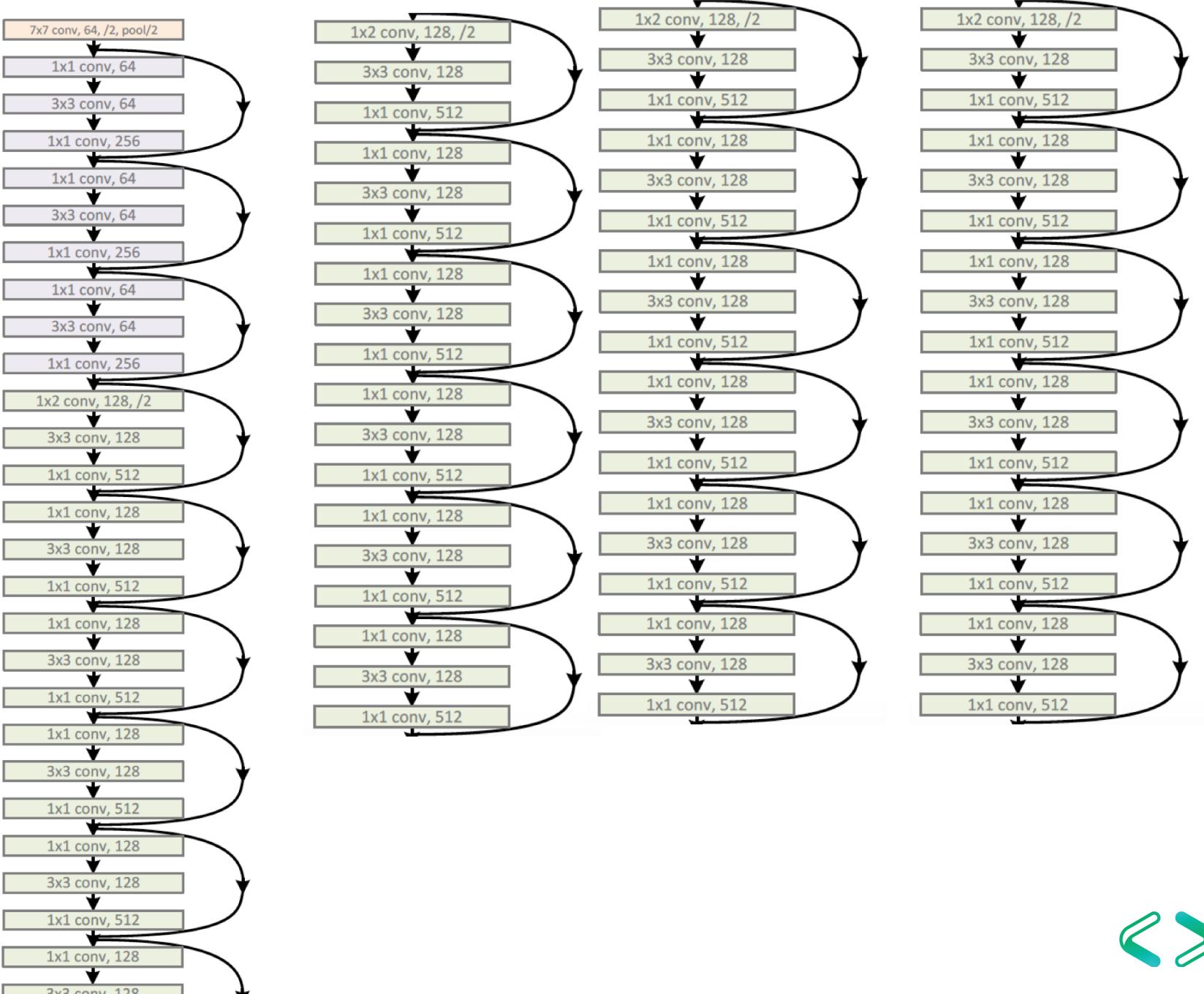
VGG, 19 layers
(ILSVRC 2014)



GoogleNet, 22 layers
(ILSVRC 2014)



Cognitive Series



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

Cognitive Services - Vision

State-of-the-art image processing algorithms help you moderate content automatically and build more personalized apps by returning smart insights about faces, images, and emotions.



Computer Vision API



Face API



Content Moderator



Emotion API PREVIEW



Video API PREVIEW



Custom Vision Service
PREVIEW



Video Indexer PREVIEW



Cognitive Services - Speech

Processing spoken language in your applications



Translator Speech API



Speaker Recognition
API PREVIEW



Bing Speech API



Custom Speech Service

PREVIEW



Cognitive Services - Language

Allow your apps to process natural language, evaluate sentiment and topics, and learn how to recognize what users want.

 Language Understanding Intelligent Service <small>PREVIEW</small>	 Text Analytics API <small>PREVIEW</small>	 Bing Spell Check API
 Translator Text API	 Web Language Model API <small>PREVIEW</small>	 Linguistic Analysis API <small>PREVIEW</small>



Cognitive Services - Knowledge

Map complex information and data in order to solve tasks such as intelligent recommendations and semantic search.



[Recommendations API](#)
PREVIEW



[Academic Knowledge API](#)
PREVIEW



[Knowledge Exploration Service](#)
PREVIEW



[QnA Maker API](#)
PREVIEW



[Entity Linking Intelligence Service API](#)
PREVIEW



[Custom Decision Service](#)
PREVIEW



Cognitive Services - Search

Make your apps, webpages, and other experiences smarter and more engaging with the Bing Search APIs.

 Bing Autosuggest API	 Bing Image Search API	 Bing News Search API
 Bing Video Search API	 Bing Web Search API	 Bing Custom Search <small>PREVIEW</small>
 Bing Entity Search API <small>PREVIEW</small>		



Cognitive Services - Labs

Labs provides developers with an early look at emerging Cognitive Services technologies. Early adopters who do not need market-ready technology can discover, try and provide feedback on new Cognitive Services technologies before they are generally available.



Project Prague

Gesture based controls



Project Johannesburg

Route logistics



Project Abu Dhabi

Distance matrix



Project Nanjing

Isochrones calculations



Project Cuzco

Event associated with
Wikipedia entries



Project Wollongong

Location insights



Face



Detect human faces and compare similar one, organize people into groups according to visual similarity, and identify previously tagged people in images.



Face



Face Identification

Search and identify faces. Tag people and groups with user-provided data and then search those for a match with previously unseen faces.



Similar Face Searching

Easily find similar-looking faces. Given a collection of faces and a new face as a query, this API will return a collection of similar faces.



Face Grouping

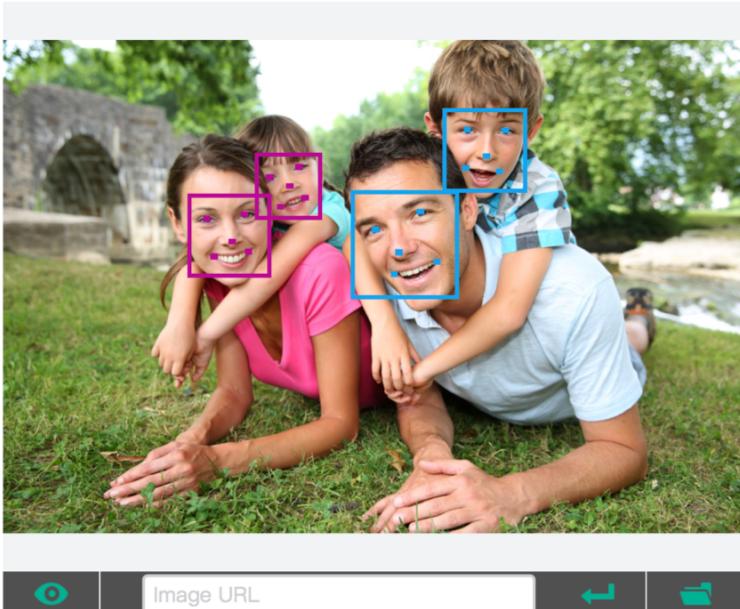
Organize many unidentified faces together into groups, based on their visual similarity.



Face



Demo ...



```
"eyeRightBottom": {  
    "x": 565.2,  
    "y": 238.1  
},  
"eyeRightOuter": {  
    "x": 573,  
    "y": 231.2  
},  
"noseRootLeft": {  
    "x": 519.3,  
    "y": 252.1  
},  
"noseRootRight": {  
    "x": 536.2,  
    "y": 246.4  
},  
"noseLeftAlarTop": {  
    "x": 523.5,  
    "y": 275.2  
},  
"noseRightAlarTop": {  
    "x": 547.8,  
    "y": 267.8  
},  
"noseLeftAlarOutTip": {
```



Emotion



Detect human faces and compare similar one, organize people into groups according to visual similarity, and identify previously tagged people in images.



Emotion

Demo ...

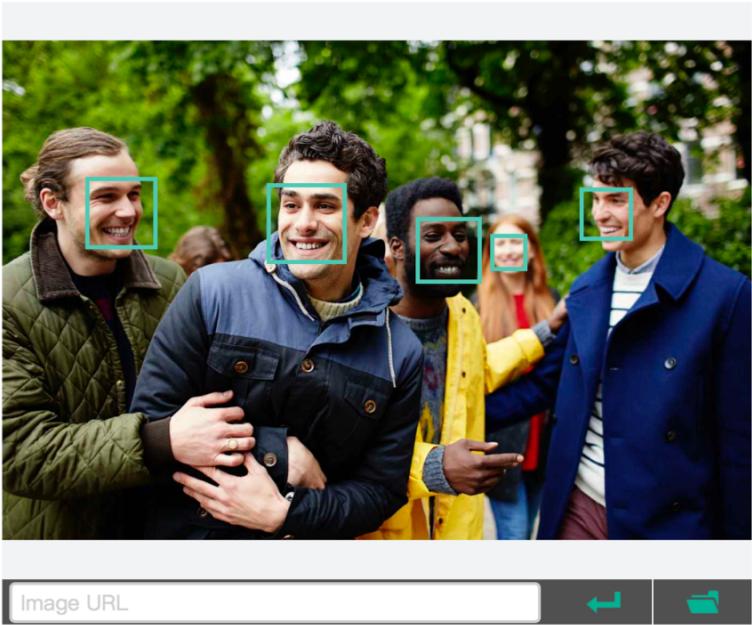


Image URL



Detection Result:
5 faces detected

JSON:

```
[  
  {  
    "faceRectangle": {  
      "left": 488,  
      "top": 263,  
      "width": 148,  
      "height": 148  
    },  
    "scores": {  
      "anger": 9.075572e-13,  
      "contempt": 7.048959e-9,  
      "disgust": 1.02152783e-11,  
      "fear": 1.778957e-14,  
      "happiness": 0.9999999,  
      "neutral": 1.31694478e-7,  
      "sadness": 6.04054263e-12,  
      "surprise": 3.92249462e-11  
    }  
  },  
  {
```



Computer Vision



Extract rich information from images to categorize and process visual data – and machine-assisted moderation of images to help curate your services.



Computer Vision



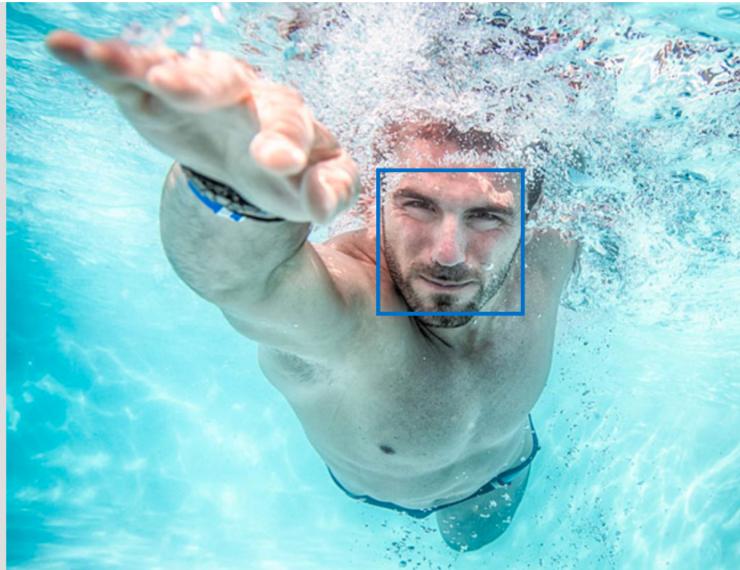
- Analyze an image
- Read text in images
- Read handwritten text from images
- Recognize celebrities and landmarks
- Analyze video in near real-time



Computer Vision



Demo ...



FEATURE	VALUE
NAME:	
Description	{ "tags": ["water", "swimming", "sport", "pool", "person", "man", "frisbee", "ocean", "blue", "bird", "riding", "top", "standing", "wave", "young", "body", "large", "game", "glass", "pond", "playing", "board", "catch", "clear", "boat", "white"], "captions": [{ "text": "a man swimming in a pool of water", "confidence": 0.8909298 }] }
Tags	[{ "name": "water", "confidence": 0.9997857 }, { "name": "swimming", "confidence": 0.955619633 }, { "name": "sport", "confidence": 0.953807831 }, { "name": "pool", "confidence": 0.9515978 }, { "name": "person", "confidence": 0.889862537 }, { "name": "water sport", "confidence": 0.664259 }]
Image format	"Jpeg"



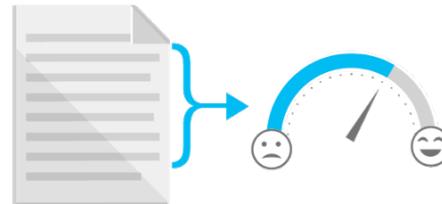
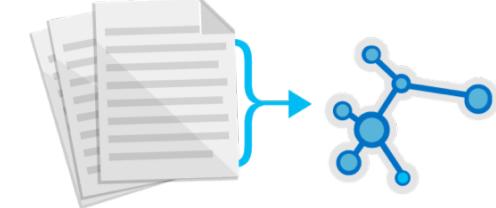
Text Analytics

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



Text Analytics

- Sentiment analysis
- Key phrase extraction
- Topic detection
- Language detection



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 ...



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 user

Novelty – recommend items that a user has not seen before

Serendipity – recommend items that are surprising to a user

Diversity – recommend dissimilar items to a user



Recommendation API

S Parka GREENLAND von F

E. Breuninger GmbH & Co. [DE] | https://www.breuninger.com/fjaellraeven-parka-greenland/1000198753/detail.cmd

KOETENLOGER VERSAND & RÜCKVERSAND VERLÄNGERTER RÜCKGABEBERECHT HOCHWERTIGE GESCHENKVERPACKUNG

Newsletter Breuninger Card Häuser Click&Collect Hilfe

breuninger

Suchbegriff oder Web-Code Suchen

NEUHEITEN DAMEN HERREN KINDER SPORT BEAUTY LUXUS WEIHNACHTEN MARKEN SALE MAGAZIN

< zurück Startseite > Marken > FJÄLLRÄVEN (27)

FJÄLLRÄVEN Parka GREENLAND

Farbe: NAVY

Größe wählen:

M = 50 L = 52 XL = 54 XXL = 56

In den Warenkorb

€ 349,99

Alle Preise inkl. gesetzl. MwSt. und zzgl. Verzandt- und Servicekosten

Kostenfreie Lieferung per Click&Collect in Ihr Breuninger Haus in 1-2 Werktagen

Bei Expresslieferung in den nächsten 21h 14min liefern wir am Freitag, den 15.12. bis 12 Uhr

Nur für kurze Zeit: kostenfreie Standardlieferung in 1-3 Werktagen

Produktdetails Material & Pflege

Material:

Material: 65% Polyester, 35% Baumwolle
Futter: 100% Polyester
Futter 2: 100% Polycotton
Füllung: 80% Daunen, 20% Federn
Enthält nichttextile Teile tierischen Ursprungs.

Pflegehinweise:

Teilen: f t g

KUNDEN, DIE DIESEN ARTIKEL ANGesehen HABEN, GEFÄLLT AUCH

Marc O'Polo DENIM BOSS Orange SCOTCH & SODA PAUL FJÄLLRÄVEN FJÄLLRÄVEN Schmuddelweda

a. LEGO Simpsons 71006 -

https://www.amazon.de/LEGO-Simpsons-71006-Das-Haus/dp/B00HWWMTXA/ref=sr_1_3?ie=UTF8&qid=1481722695&sr=8-3&keywords=lego+simpsons

LEGO Simpsons 71006 - Das Simpsons Haus

Erstellen Sie Ihre [Wunschliste](#) und erhalten Sie automatisch die Chance, einen Lego-Aktionsgutschein zu gewinnen.

von Lego ★★★★★ 19 Kundenrezensionen

Preis: EUR 239,99 Alle Preisangaben inkl. USt

Nur noch 1 auf Lager Lieferung noch vor Weihnachten.

Lieferung 16.-20. Dez, wenn Sie Standardversand an der Kasse wählen. Siehe Details. Verkauf und Versand durch gallohand. Für weitere Informationen, Impressum, AGB und Widerrufsrecht klicken Sie bitte auf den Verkäufernamen. 35 neu ab EUR 238,99 1 gebraucht ab EUR 199,90

6 Minifiguren sind enthalten: Homer, Marge, Bart, Lisa, Maggie und Ned Flanders
- Ein großer Wohnbereich mit dem Wohnzimmer, der Küche und Schlafzimmers
- Wohnzimmer mit Fernseher, auf dem Icky und Scratches läuft. Couch, Boot-Gemälde, Telefon, Teppich, lilafarbenes Klavier und Treppe in den ersten Stock
- In Barts Zimmer stehen ein Bett, Nachttischlampe, Schreibtisch mit Pinboard, ein Stuhl, ein Poster mit Krusty dem Clown, Skateboard, Regale mit Büchern
- Schlafzimmer von Marge und Homer mit großem Bett, 2 Nachttischen, Maggies Wege und Marges Tasche

Weitere Produktdetails

Kinderweihnachtswelt Lassen Sie sich bei Ihrer Geschenk-Suche von den angesagtesten Spielsachen 2016 inspirieren. Die Highlights für jedes Alter finden Sie hier.

Für größere Ansicht Maus über das Bild ziehen

Wird oft zusammen gekauft

Gesamtpreis EUR 244,78

Dieser Artikel wird von verschiedenen Verkäufern verkauft und versendet. Details anzeigen
Dieser Artikel: LEGO Simpsons 71006 - Das Simpsons Haus EUR 239,99
LEGO Minifiguren The Simpsons Serie 2 - 1 zu Zufällige Figur EUR 4,79

Kunden, die diesen Artikel gekauft haben, kauften auch

LEGO Simpsons 71016 - Villa E-Max LEGO Minifiguren The Simpsons Serie 2 - 1 Lego 71005 Minifiguren United Labels - 0805390 - 21 Minifiguren LEGO Ideas Serie 2 LEGO 40139 - Minifiguren LEGO Ideas 21302 - The Big Bang Theory LEGO 71009 Minifiguren LEGO Technic 42006 - Drehleiter



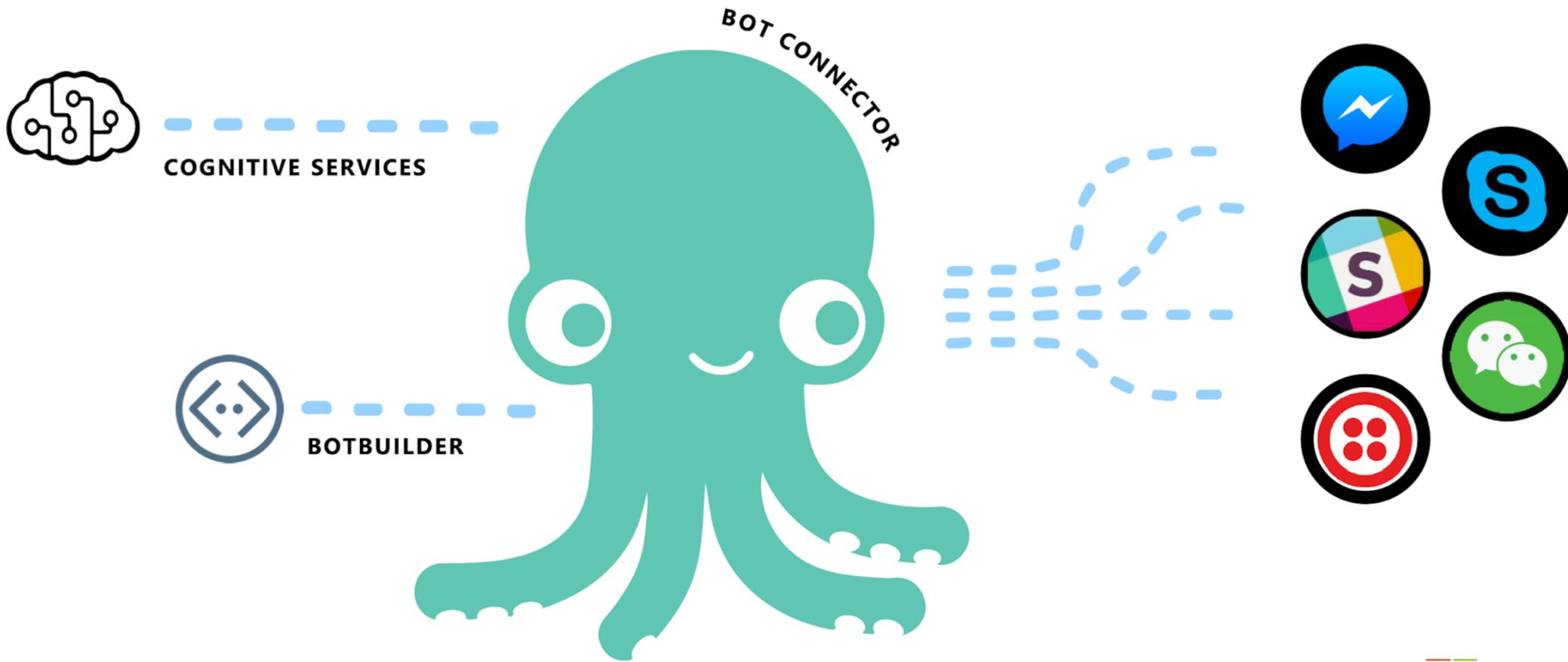
Recommendation API



Demo ...



Q&A Bot

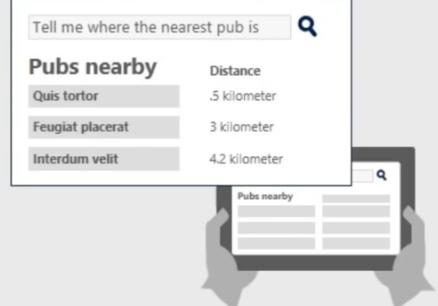


Q&A Bot

Engage with customers where they already are



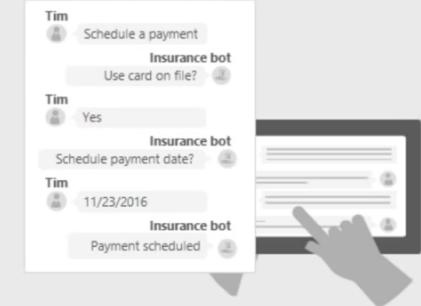
Connect people to a wealth of information



Enable easier way to capture information

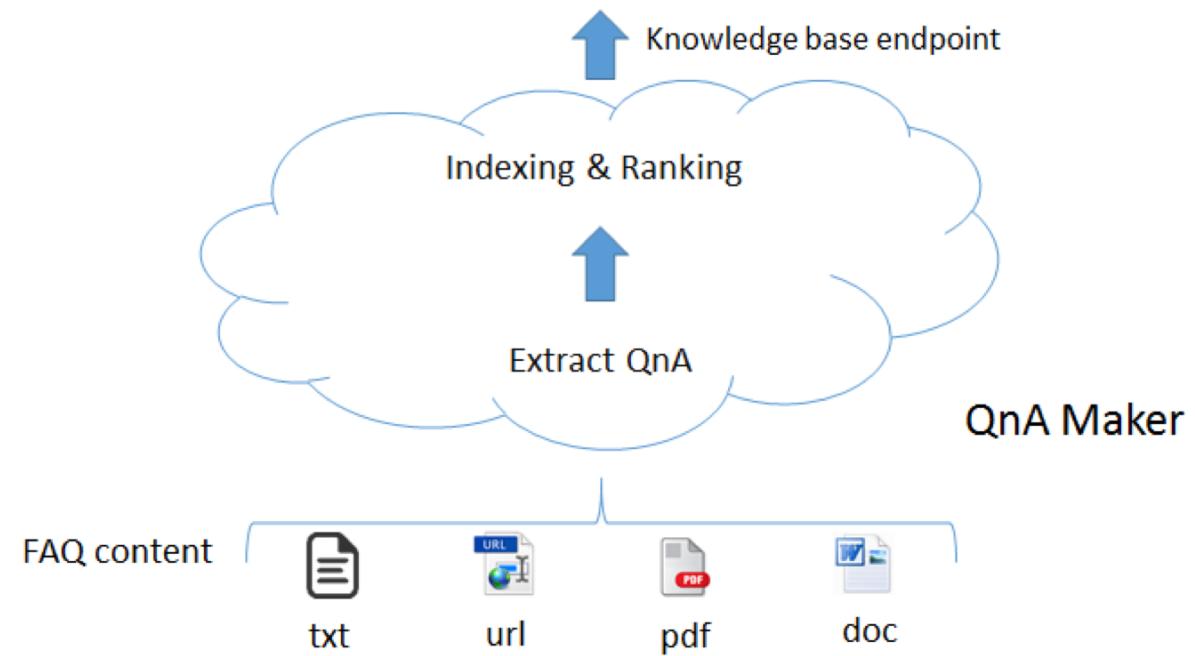
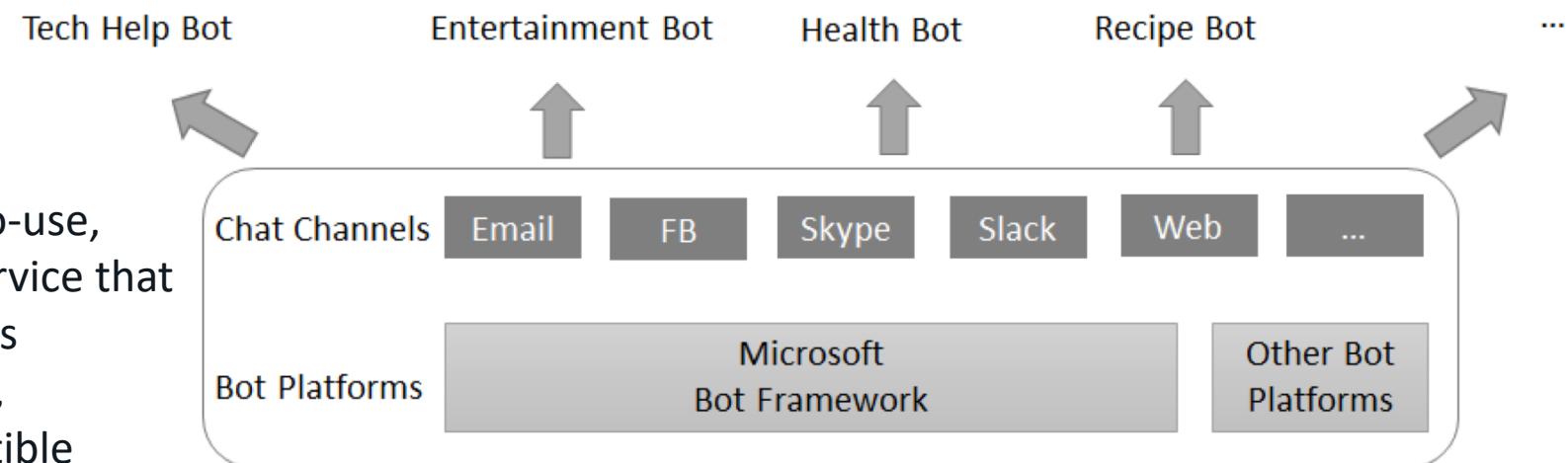


Automate tasks to increase productivity



Q&A Bot

QnA Maker is a free, easy-to-use, REST API and web-based service that trains AI to respond to user's questions in a more natural, conversational way. Compatible across development platforms, hosting services, and channels, QnA Maker is the only question and answer service with a graphical user interface—meaning you don't need to be a developer to train, manage, and use it for a wide range of solutions



Q&A Bot

Demo ...



Favorite cocktail demo



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	Type	Description
Item Id	Yes	[A-z], [a-z], [0-9], [] (Underscore), [-] (Dash) Max length: 50	Unique identifier of an item.
Item Name	Yes	Any alphanumeric characters Max length: 255	Item name.
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	Type	Description
User Id	Yes	[A-z], [a-z], [0-9], [_] (Underscore), [-] (Dash) Max length: 255	Unique identifier of a user.
Item Id	Yes	[A-z], [a-z], [0-9], [_] (Underscore), [-] (Dash) Max length: 50	Unique identifier of an item.
Time	Yes	Date in format: YYYY-MM-DDTHH:MM:SS (e.g. 2013-06-20T10:00:00)	Transaction time.
Event	No	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



Cognitive Services

Demo ... Cocktail recommendation



Cognitive Services

Demo Microsoft



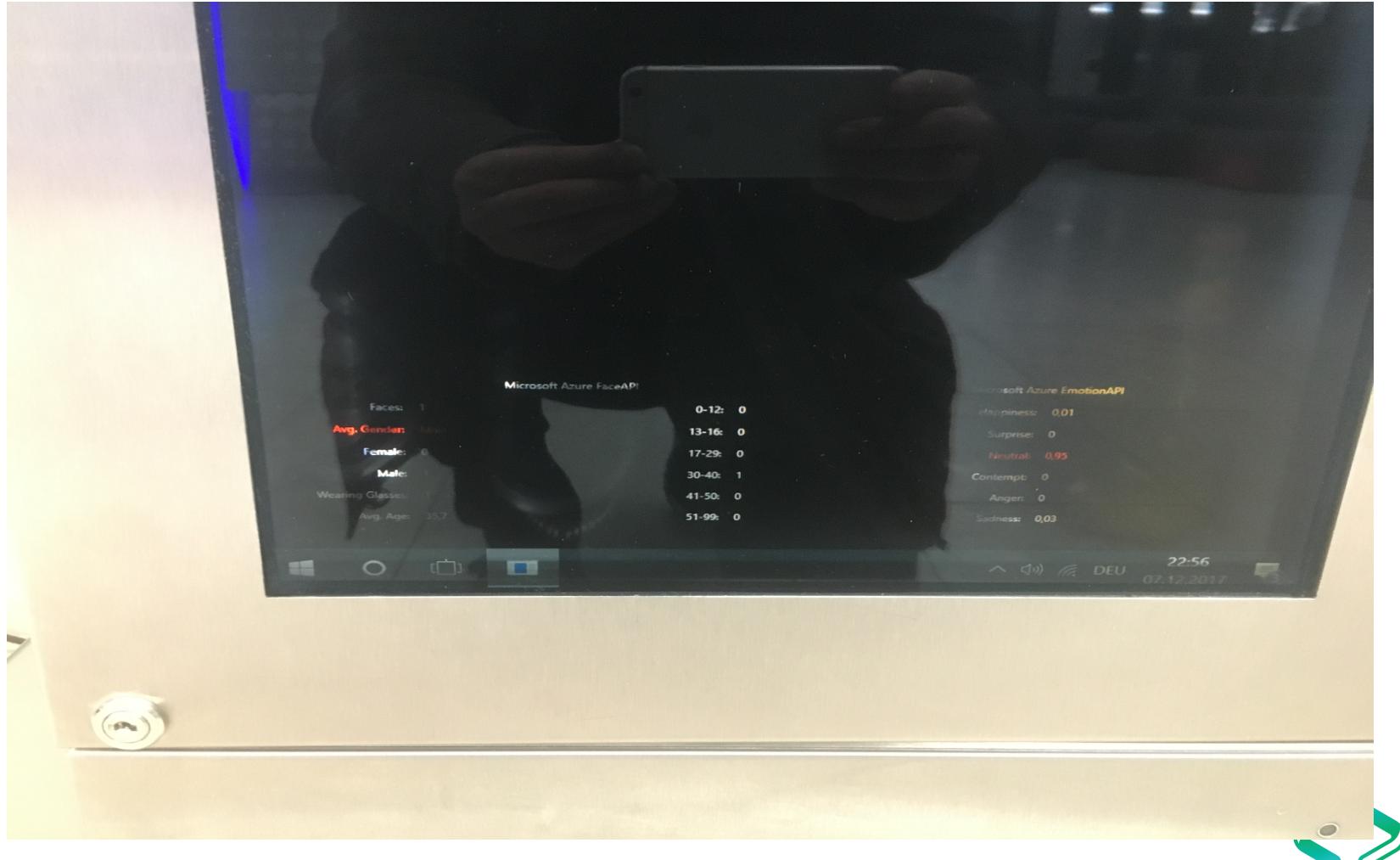
Cognitive Services

Demo Microsoft



Cognitive Services

Demo Microsoft



What's next?

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



Question! Question?

Thank you for your attention

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Weitere Informationen

Cognitive Services

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

Seeing AI Prototype

<https://www.youtube.com/watch?v=R2mC-NUAmMk>

Keynote Cognitive Services Build 2017

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

Cognitive Services with cameras

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

Seeing AI

<http://SeeingAI.com>

