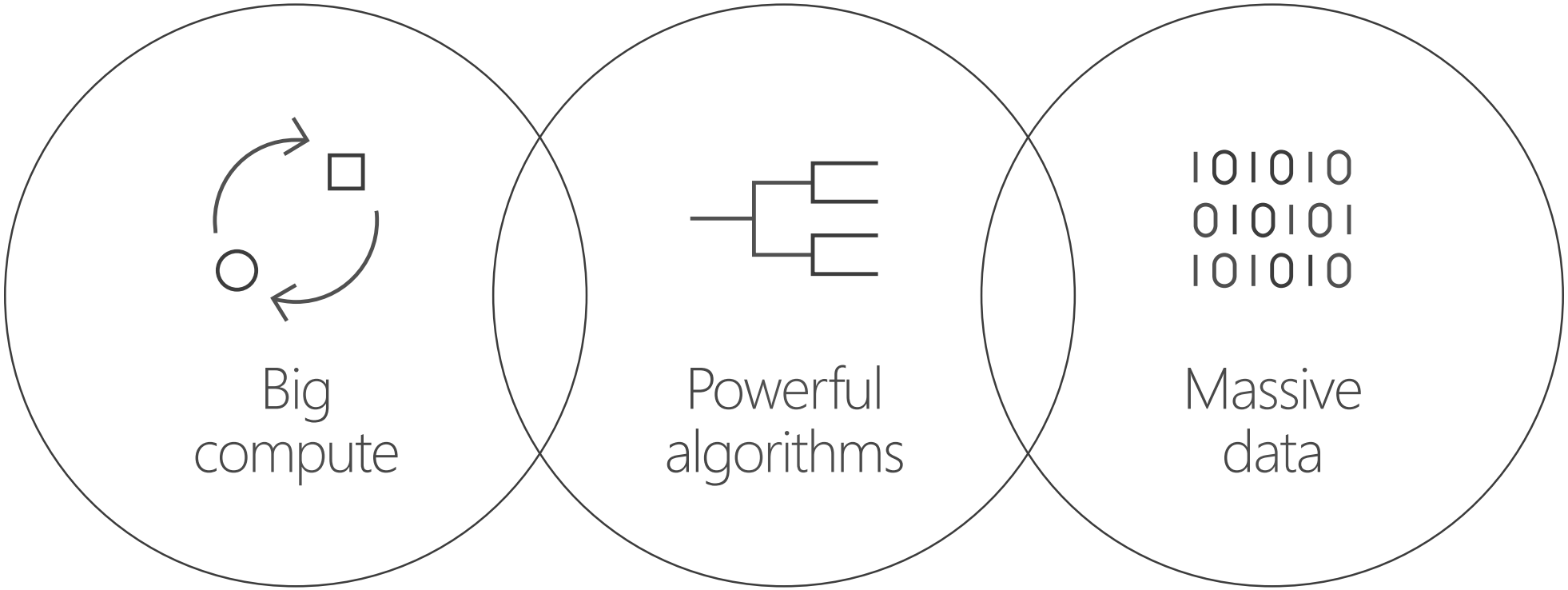
Microsoft Cognitive Services

Philip Coachman
Cloud Solution Architect – Data & AI

Microsoft


Big compute
Powerful algorithms
1010101
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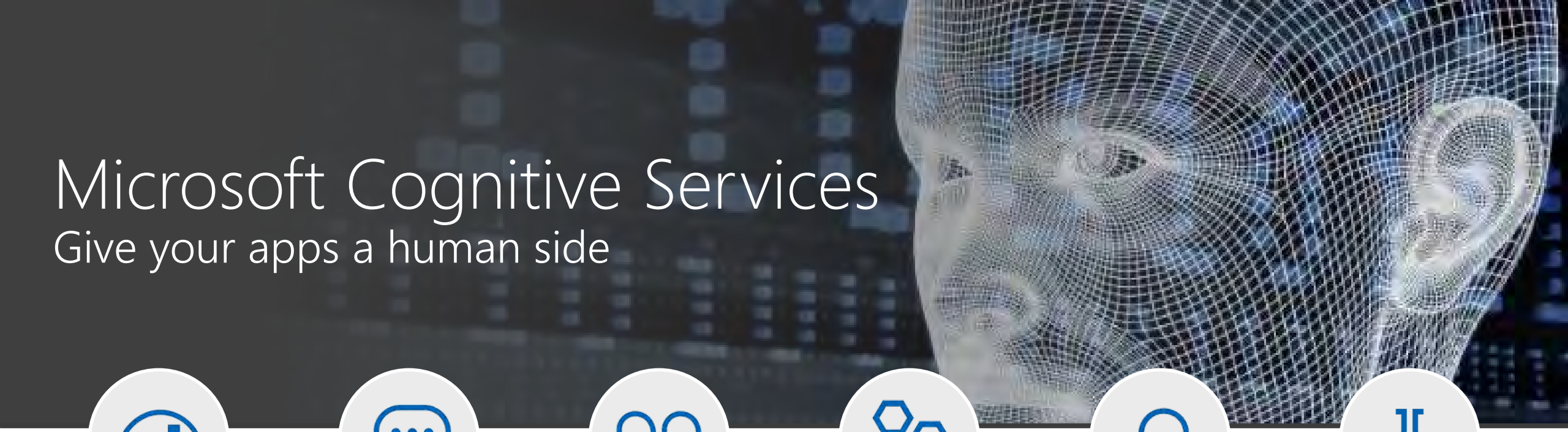
Massive data

Microsoft Cognitive Services

Democratizing intelligence

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, and understanding intent

Language

Process text and learn how to recognize what users want

Knowledge

Tap into rich knowledge amassed from the web, academia, or your own data

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 and give feedback on new technologies before general availability

Microsoft Cognitive Services

Give your apps a human side

Vision

Computer Vision

Content Moderator

Emotion

Face

Video Indexer

Custom Vision Service

Speech

Bing Speech

Speaker Recognition

Custom Speech Service

Language

Bing Spell Check

Linguistic Analysis

Text Analytics

Translator Text & Speech

Web Language Model

Language Understanding

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 Entity Search

Bing Custom Search

Labs

Project Prague (gesture)

Project Cuzco (events)

Project Johannesburg (natural)

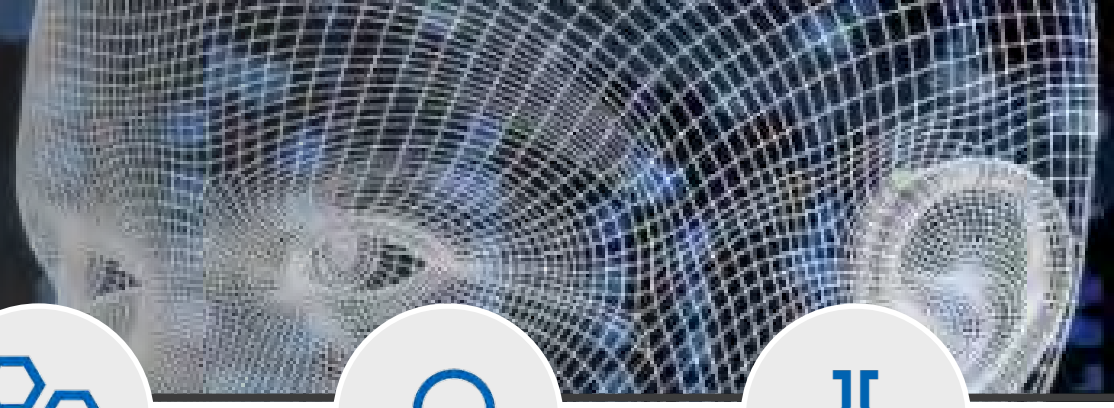
Project Nanjing (isochrones)

Project Abu Dhabi (distance matrix)

Project Wollongong (location)

Microsoft Cognitive Services

Give your apps a human side



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CUSTOMIZATION

Custom Vision Service

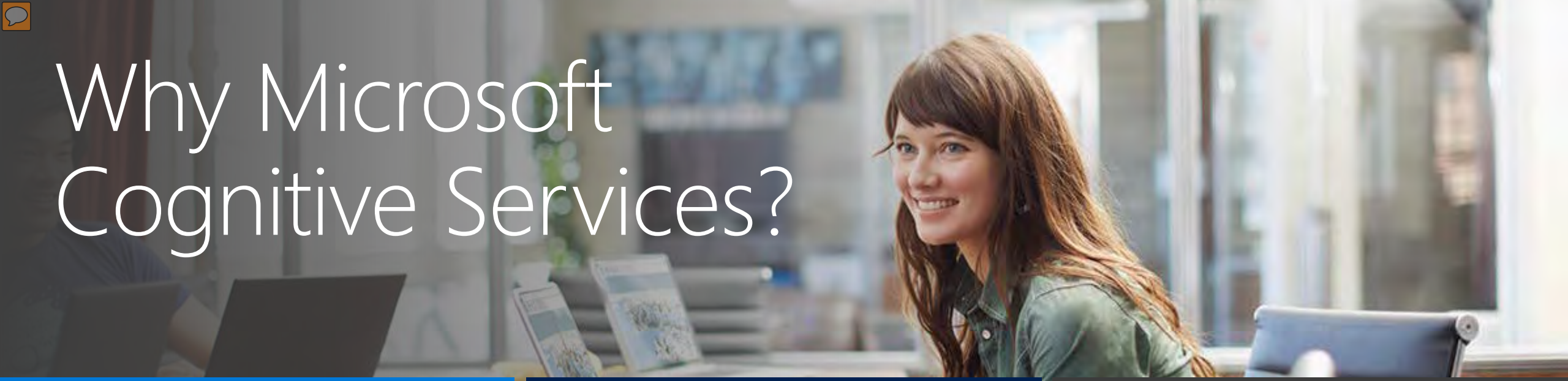
Custom Speech Service

Language Understanding

Custom Decision Service

Bing Custom Search

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

Bring your own data for your custom experience

Tested

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

Quality documentation, sample code, and community support

A variety of real-world applications

Vision

What is in the image?

Computer Vision

Category	People; 5 faces
Adult/Racy?	False/False
Dominant colors	☐ ■ ■ ■
Accent color	

Speech

Give me directions to the nearest local branch.

Bing Speech

- Convert spoken audio to text
- Convert text to spoken audio
- Extract intent of user

Language

Play today's customer call recording.

Language Understanding

Natural Language Processing

```
Intent: PlayCall
Content: Customer#
DateTime.date: today
```

Now Playing

11/29/2016 Customer Call

Knowledge

Top publications in customer lifecycle trends?

Knowledge Exploration

Here are the top results:

Customer Relationship Management – 5 Key Trends for 2014 CRM

Oct 28, 2015 – Here are FIVE key **trends** in 2014 that would help marketers in rolling ... Of late, marketers are looking at **customer lifecycle** management (CLM)

Predictive Customer Lifecycle Management (CLM)

The purpose of **Customer Life-cycle** Management (CLM) is to maximize both customer retention and .... Predictive trend analysis provides business visibility.

Trends 2016: The Future of Customer Service

Jan 5, 2016 – The top 10 **customer** service **trends** for 2016 that .... North American Consumer

Language Around Customer Lifecycles in the Banking Industry

View PDF

Search

Search for 'fraud prevention'

Bing News Search

Here is what I found:

Information Communications Media Market News

It also investigates the top three expected **Fraud** Detection and **Prevention** programs, in terms of demand in key markets...

The Big Question: In-House or Outsourced Fraud Protection?

First, let's point out that there is not one absolute answer—there are "pros" and "cons" to each. Those who favor in-house...

How to Protect Your Business from Online Fraud this Holiday Season

Michael heads fraud prevention tool. Online and mobile shopping are expected to continue growing apace...

Microsoft Cognitive Services Labs

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

Project Prague
Gesture based controls

Project Cuzco
Event associated with Wikipedia

Project Johannesburg
Route logistics

Project Nanjing
Isochrones calculations

Project Abu Dhabi
Distance matrices

Project Wollongong
Score location attractiveness

DEMONSTRATIONS

INTELLIGENT KIOSK

VISION

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

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

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}}]

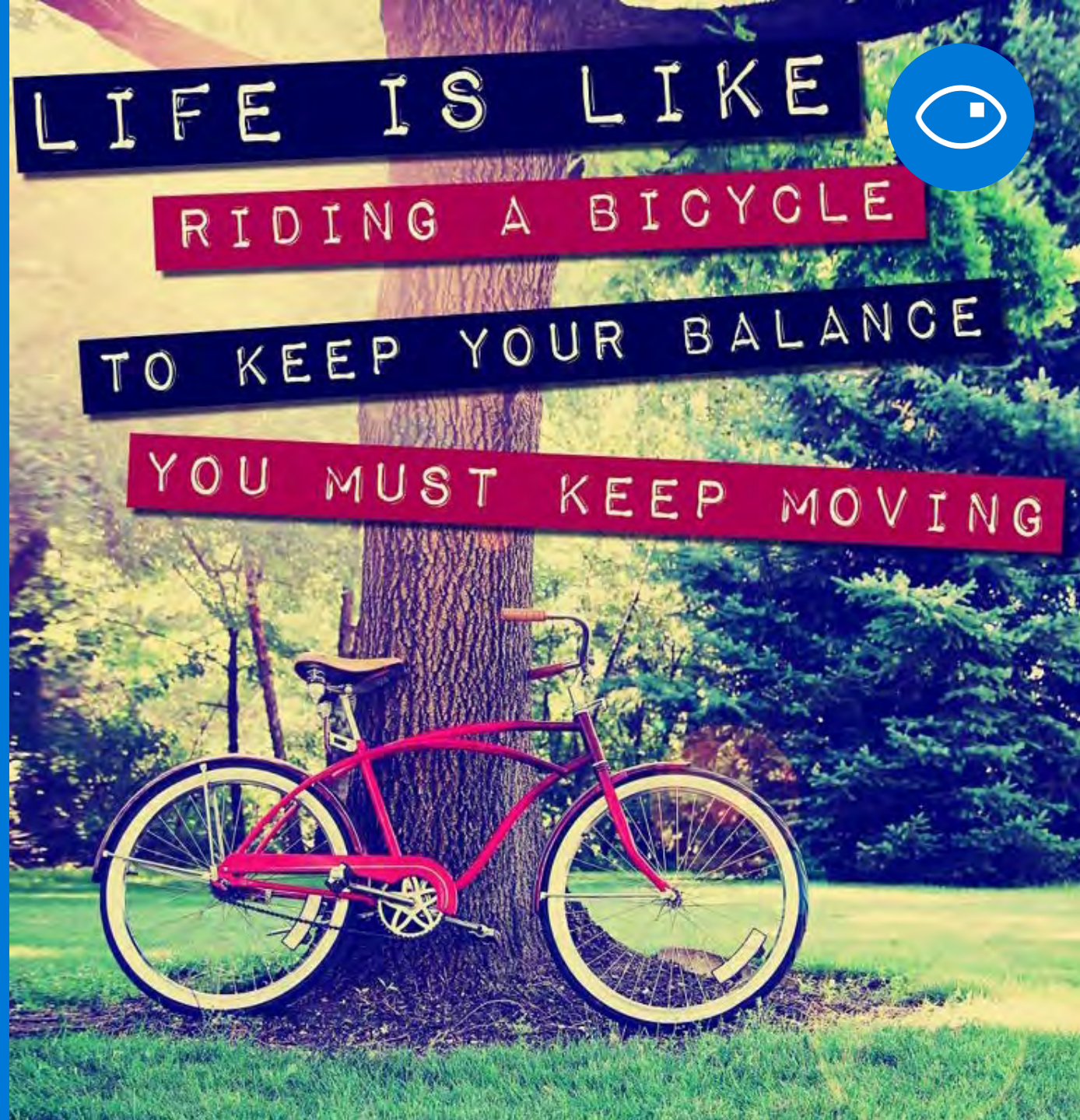
Image colors

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"
      }
. . .
```

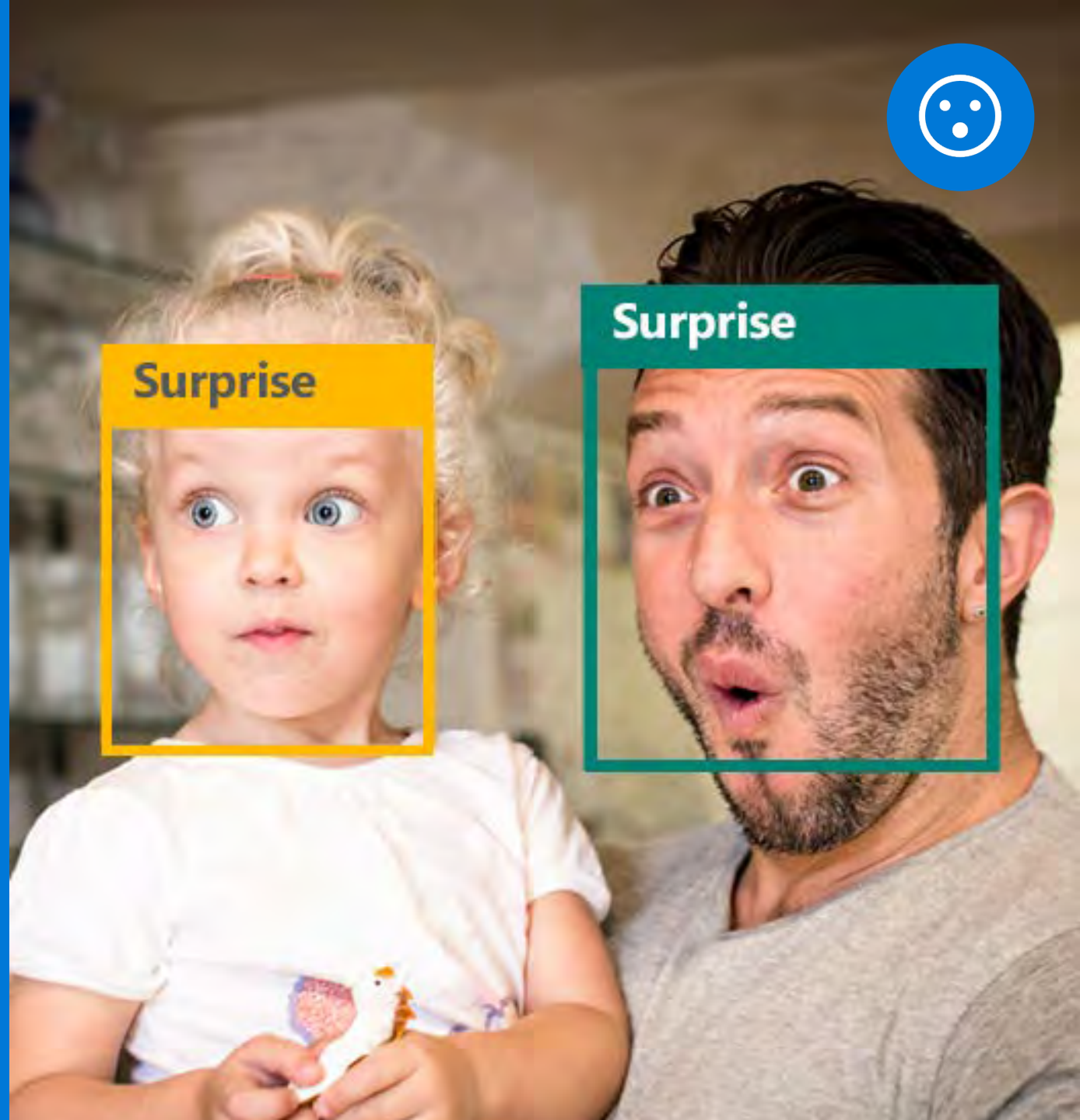
Emotion API

Face detection

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

Emotion scores

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



Face API

Detection

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

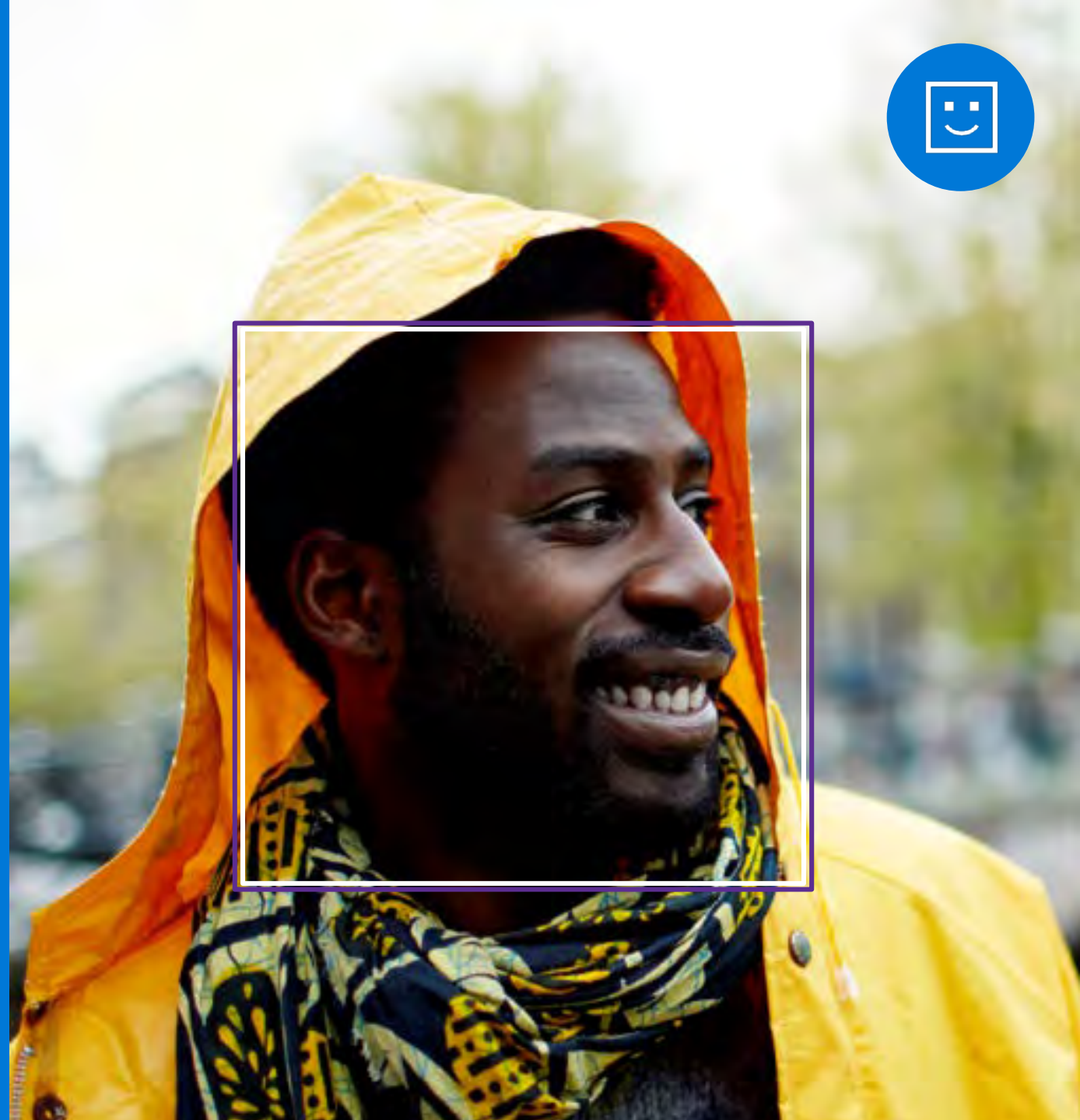
Feature attributes

```
"attributes": { "age": 42, "gender": "male",
"headPose": { "roll": "8.2", "yaw": "-37.8",
"pitch": "0.0" }}
```

Grouping

Identification

Jasper Williams



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

LANGUAGE

Process text and learn how to recognize what users want

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

Language Understanding Intelligent Service

Understand what your users are saying

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

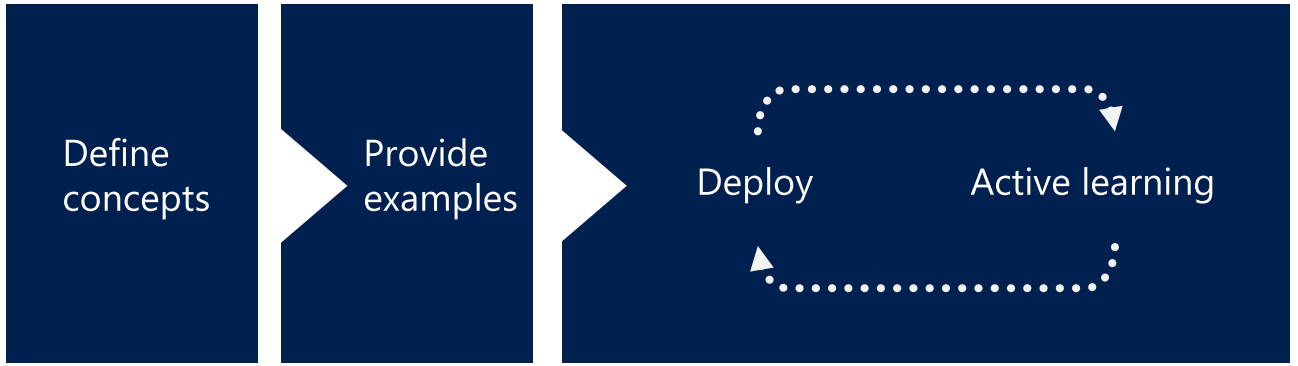
Language Understanding Intelligent Service

Reduce labeling effort with interactive featuring

Use visualizations to gauge performance and improvements

Leverage speech recognition with seamless integration

Deploy using just a few examples with active learning



Language understanding models

"News about flight delays"


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

Linguistic analysis

Analysis tolls for natural language processing

Access to part-of-speech tagging and parsing, identifying concepts, and actions

Linguistic analysis

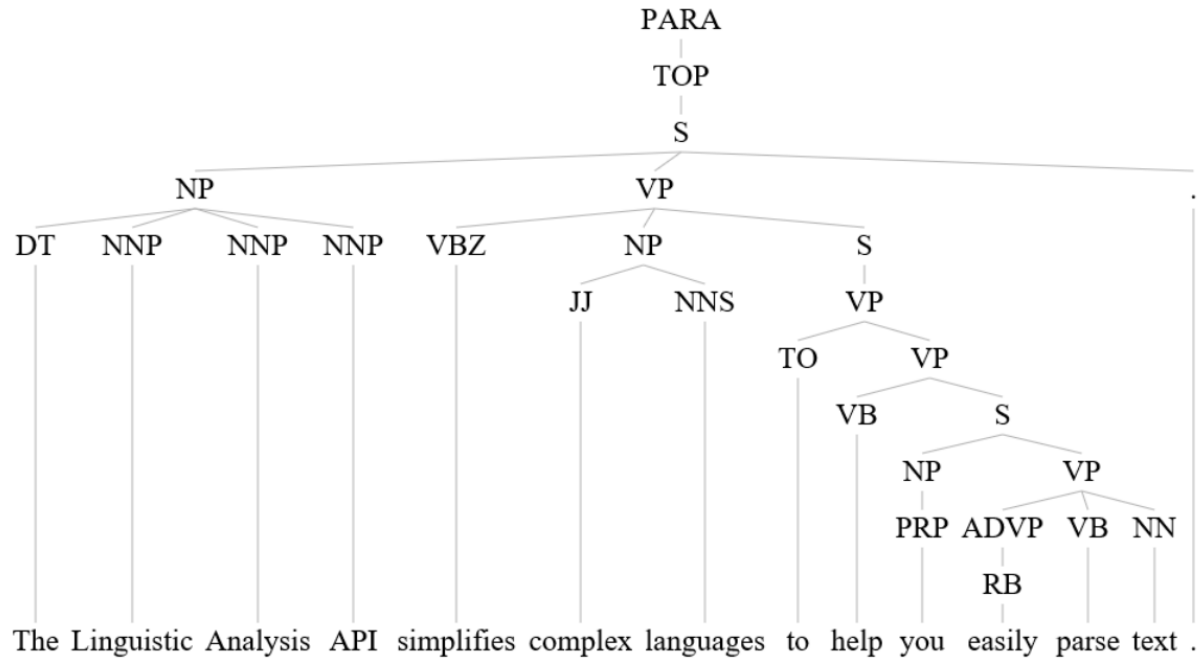
Enter a sentence

The Linguistic Analysis API simplifies complex languages to help you easily parse text.

POS tags

[["DT","NNP","NNP","NNP","VBZ","JJ","NNS","TO","VB","PRP","RB","VBP","NN","."]]

Constituency tree



Text analytics

Sentiment analysis

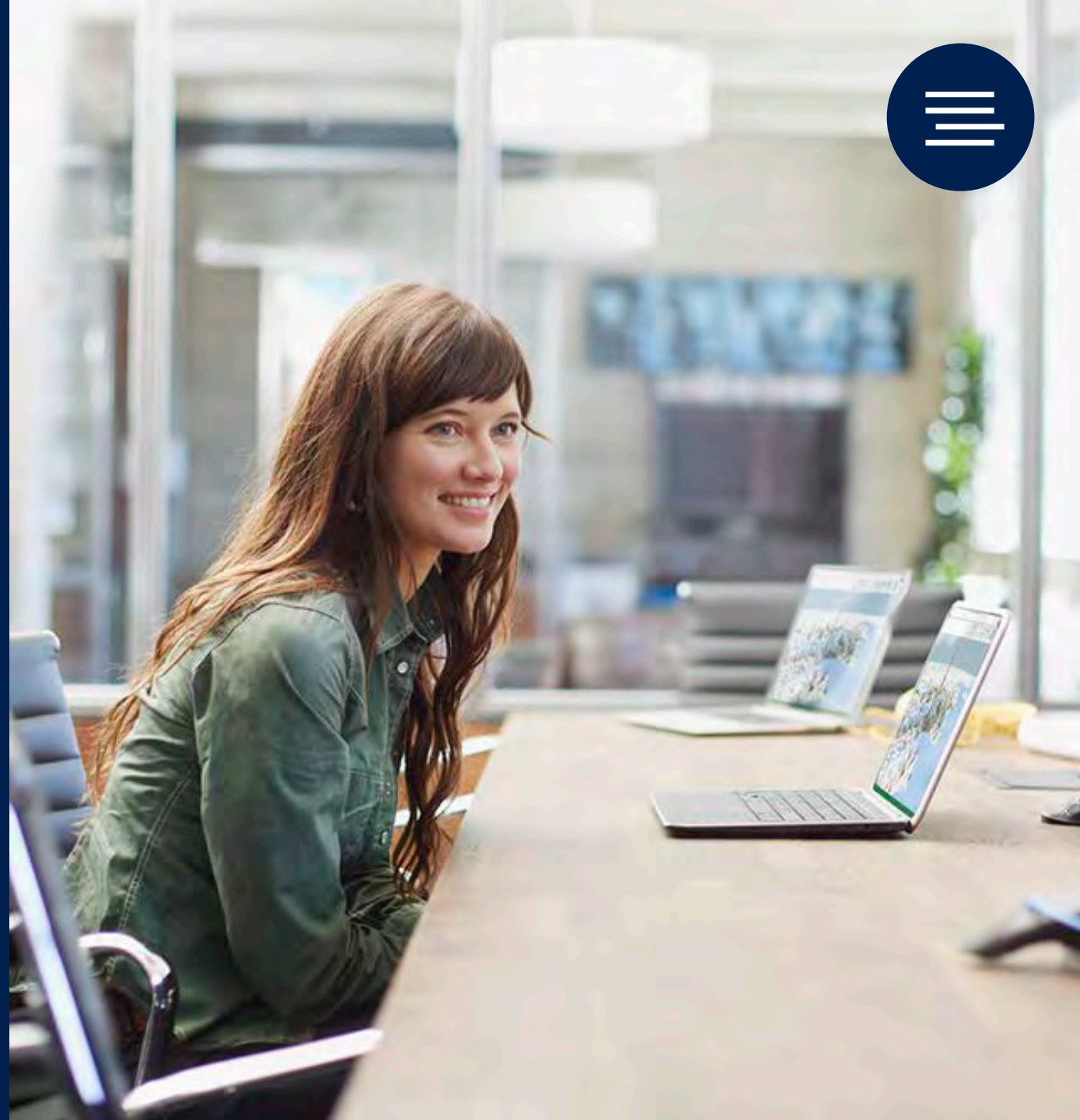
Understand if a record has positive or negative sentiment

Key phrase extraction

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

Language detection

Identify the language, 120 supported languages



Microsoft Translator

Translator Text API

Automatically detect language and easily power translation to and from 60 supported text languages

Translator Speech API

Easily translate real-time speech conversations in 9 support languages

KNOWLEDGE

Tap into rich knowledge amassed from the web, academia, or your own data

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

Academic knowledge

Interpret
Interprets a natural language user query string. Returns annotated interpretations which can enable rich search-box auto-completion experiences that anticipate what the user is typing

Evaluate
Evaluates a query expression and returns academic knowledge entity results

Calchistogram
Calculates a histogram of the distribution of attribute values for the academic entities returned by a query expression, such as the distribution of citations by year for a given author

QnA Maker

Create a FAQ service from existing content

Extract questions and answers

Extract all possible pairs of questions and answers from user provided content – FAQ URLs, documents and editorial content

Test, train and publish

Edit, remove, or add pair before testing and training the knowledge base and publishing your knowledge base as an API endpoint

Integrates with other APIs and solutions

Use QnA Maker with Cognitive Services such as LUIS & create something as elegantly simple as a chat bot that answers FAQs, or as complex as an interactive virtual guide

Custom Decision Service

A cloud-based, contextual decision-making API that sharpens with experience.

Contextual

Understanding context from information you provide, Custom Decision Service ranks the options and makes a decision

Rapid learning

Custom Decision Service automatically optimizes based on your feedback. It even experiments with new options to see if the best decision has changed, enabling it to adjust to emerging trends

Easy to use

Custom Decision Service is cloud-based, so it's easy to run, able to plug into your application and help to make decisions in real time

Bringing it all together

The Seeing AI App

Computer Vision, Image, Speech Recognition, NLP, and ML from Microsoft Cognitive Services

Read blog here

Watch video here

DEVELOPER RESOURCES

Pricing

https://azure.microsoft.com/en-us/pricing/details/cognitive-services/

Documentation

https://docs.microsoft.com/en-us/azure/#pivot=products&panel=cognitive

Client SDKs

https://azure.microsoft.com/en-us/resources/samples/?sort=0&term=cognitive+services
https://github.com/southwood/project-oxford-python

Example Code

https://github.com/jsturtevant/happy-image-tester-django
https://github.com/Microsoft/Cognitive-Face-Android
https://github.com/Microsoft/Cognitive-Samples-IntelligentKiosk

Join Our Community

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https://cognitive.uservoice.com/