Microsoft

A Brief Journey from Device to Action …

hackster.io

IoT Virtual Bootcamp

December
12 – 14, 2017

http://aka.ms/IoTVirtualBootcamp

Hardware Partners :

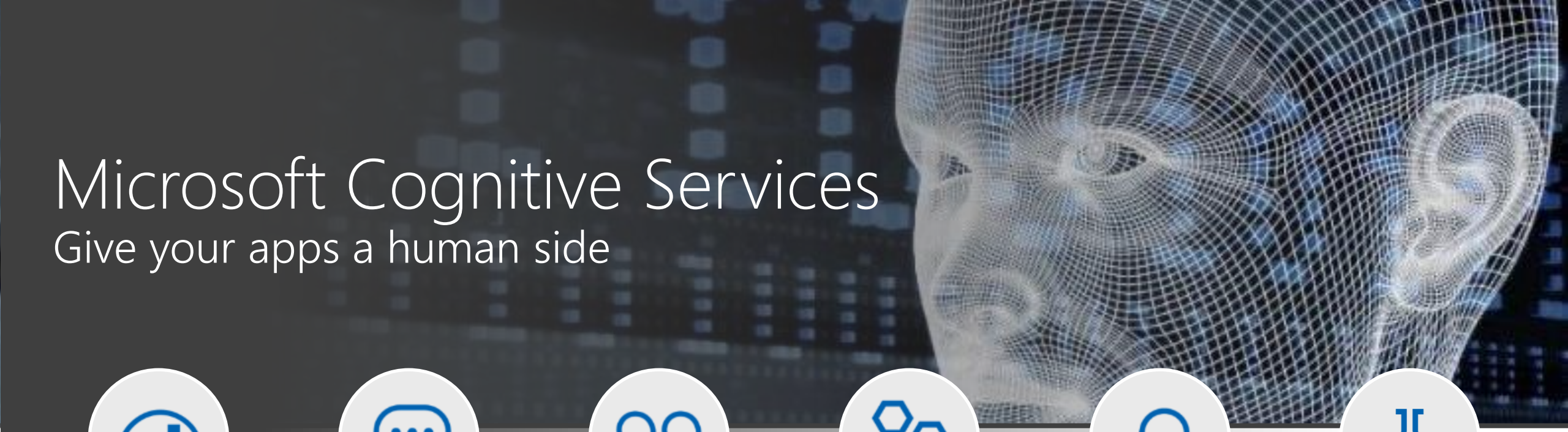
adafruit

Microsoft Cognitive Services

Maarten Struys

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

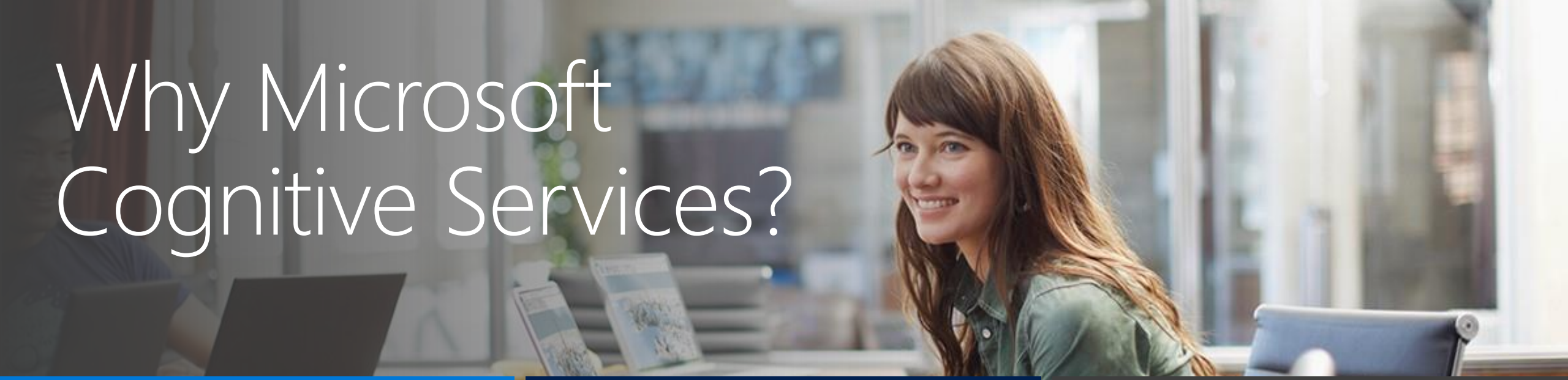
Search

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

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

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

VISION

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

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

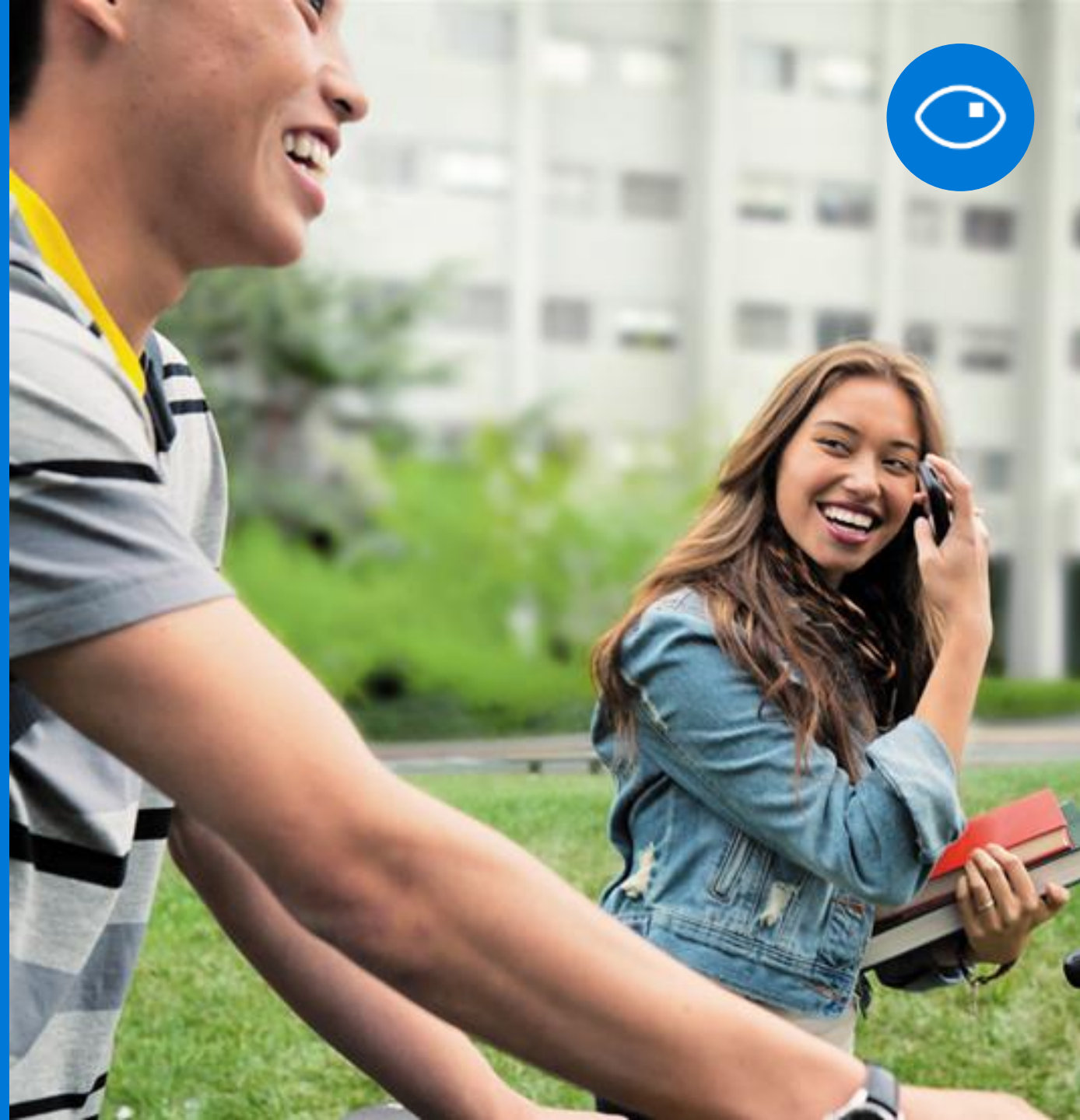
Computer Vision API

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

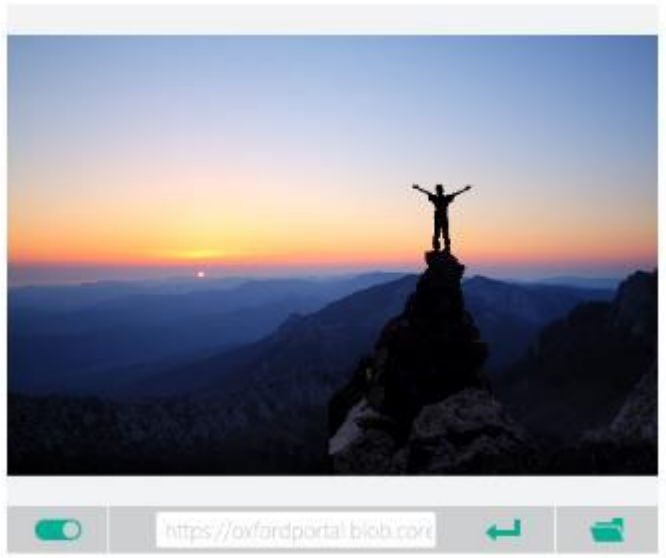
Dominant Color Background	White
Dominant Color Foreground	Grey
Dominant Colors	White
Accent Color	

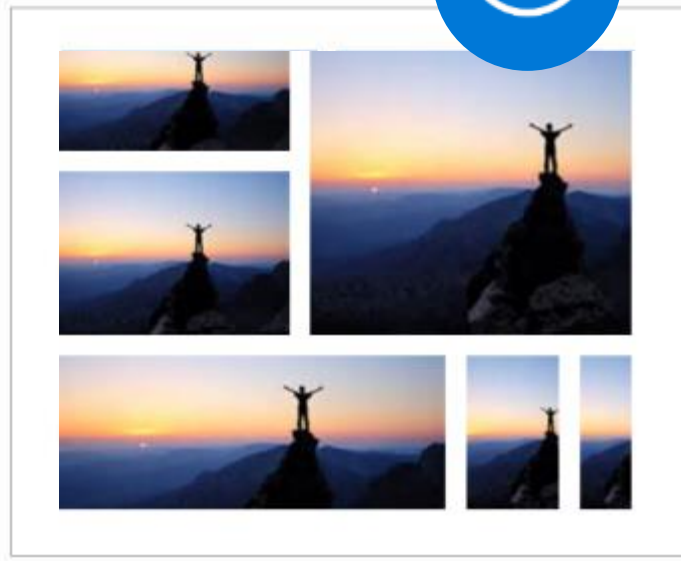
OCR

```
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"
      }
. . .
```

Smart thumbnail

Smart cropping **off**





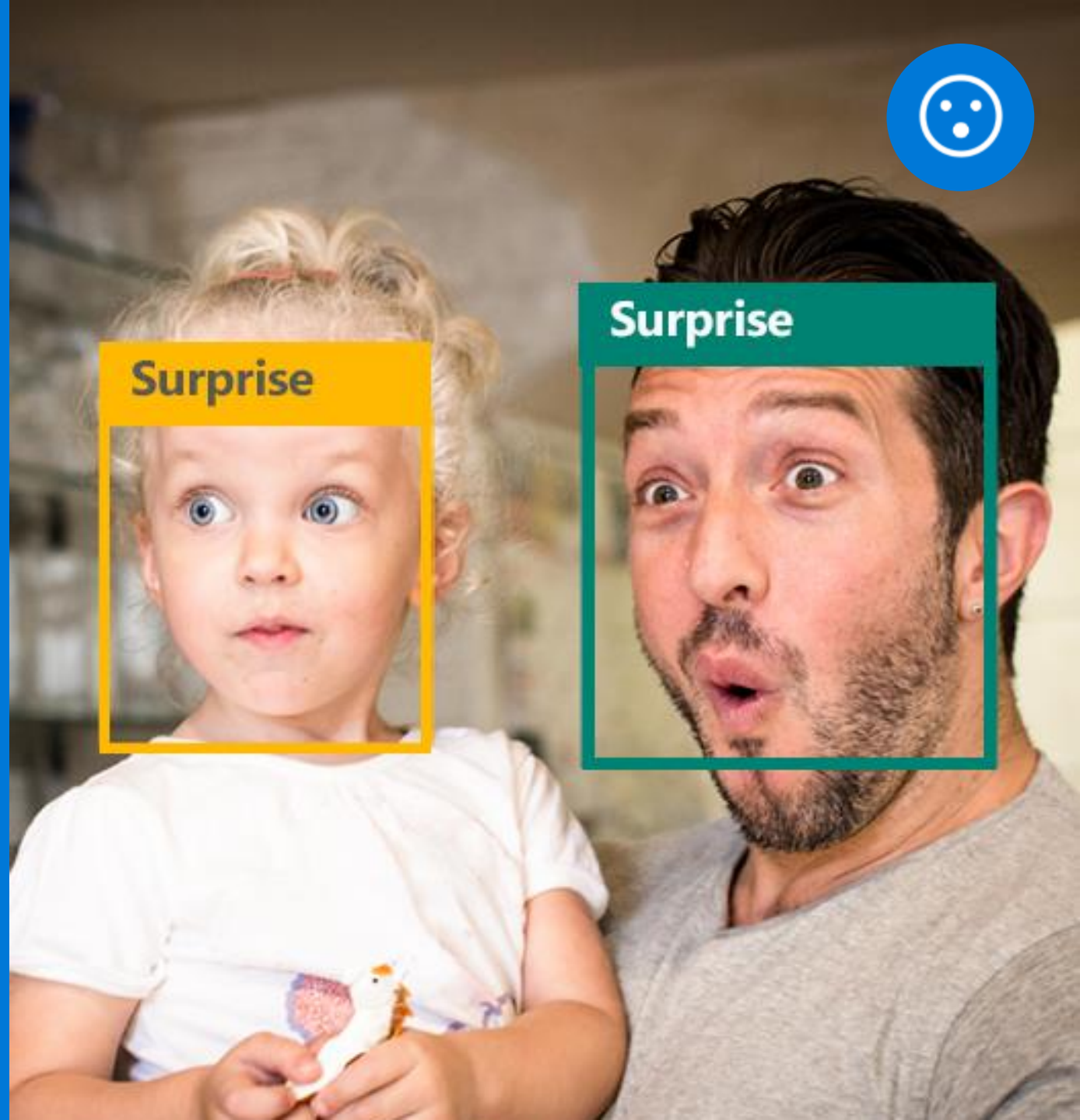
Emotion API

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

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

Face API

Detection

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

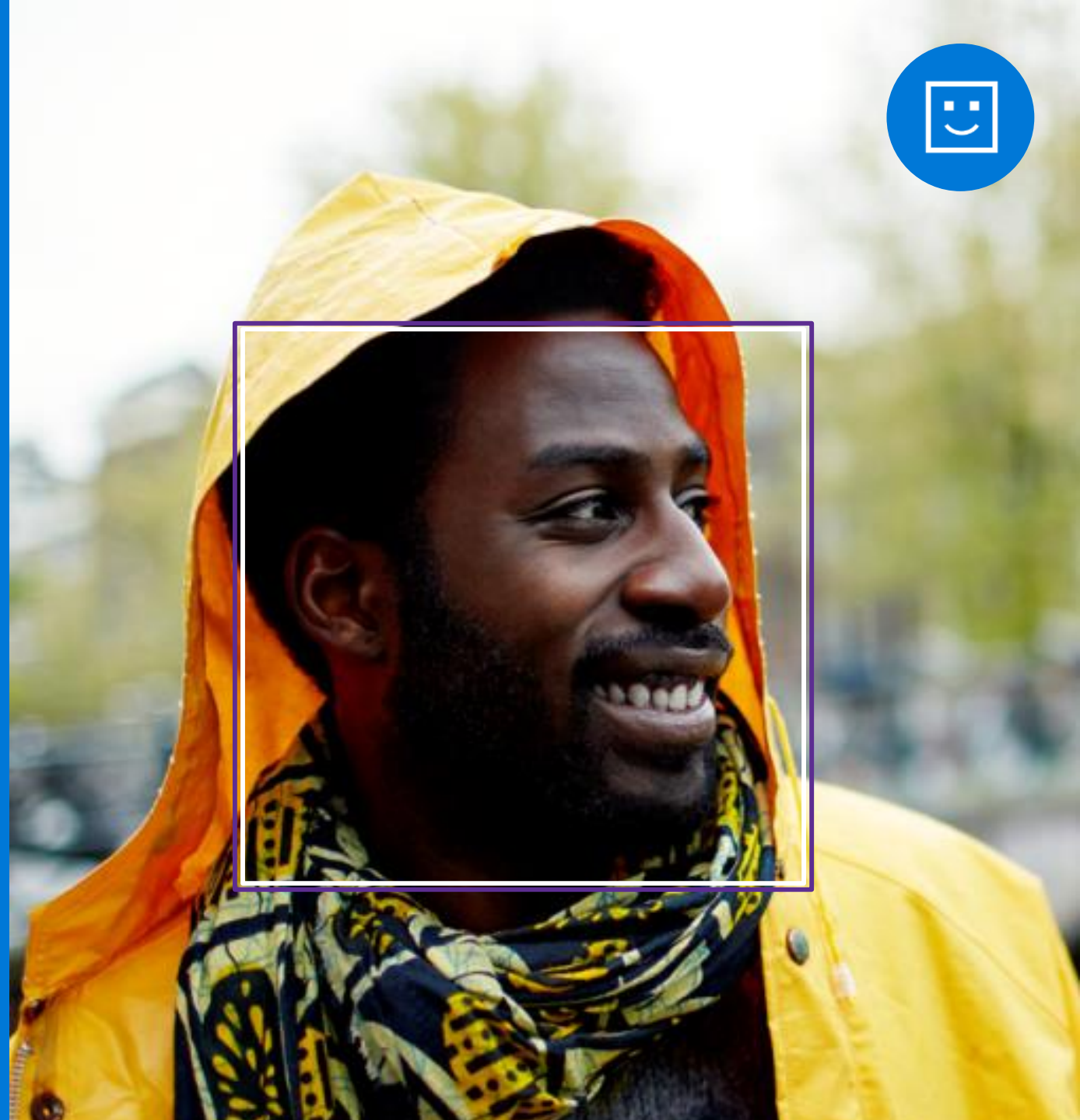
Feature attributes

```
"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

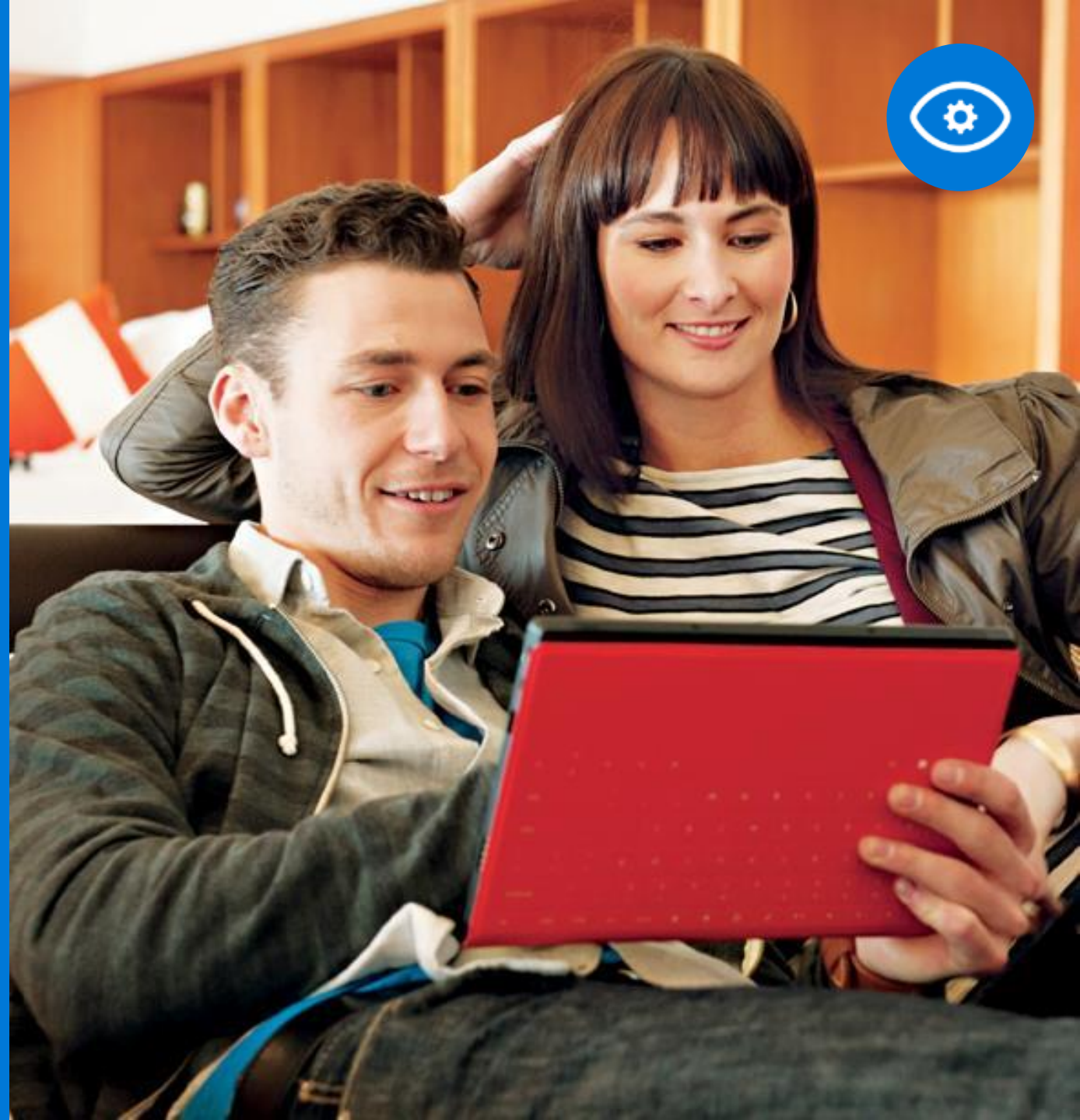
Use your labeled images to teach Custom Vision Service the concepts you want it to learn

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



Video Indexer

Unlock video insights

Upload your video and go

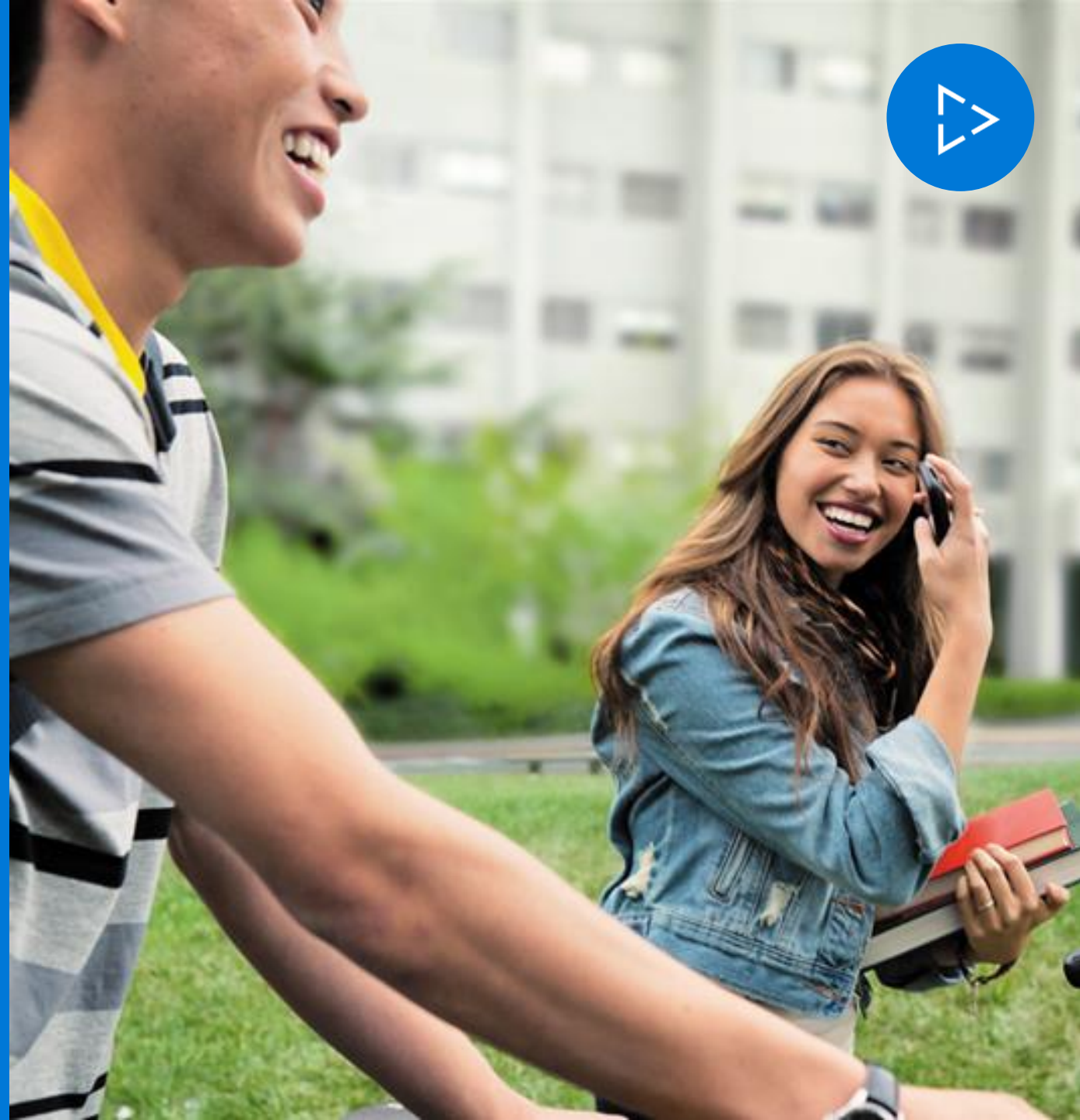
Start turning your video into insights right away. No more tedious and error-prone manual indexing. And no need for specialized expertise. With Video Indexer, just upload your video, and start finding insights right away, without writing a single line of code

Make your content more discoverable

Quickly and easily extract insights from videos using artificial intelligence. Enhance content discovery experiences such as search results by detecting spoken words, faces, characters, and emotions

Improve engagement with your video

Metadata extracted by Video Indexer can be used to build powerful engagement experiences with recommendations, highlight clips, and interactive videos



SPEECH

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

Custom Recognition | Speaker Recognition | Speech

Bing Speech API

Voice recognition (speech to text)

Converts spoken audio to text

Voice output (text to speech)

Synthesize audio from text

Speech intent recognition

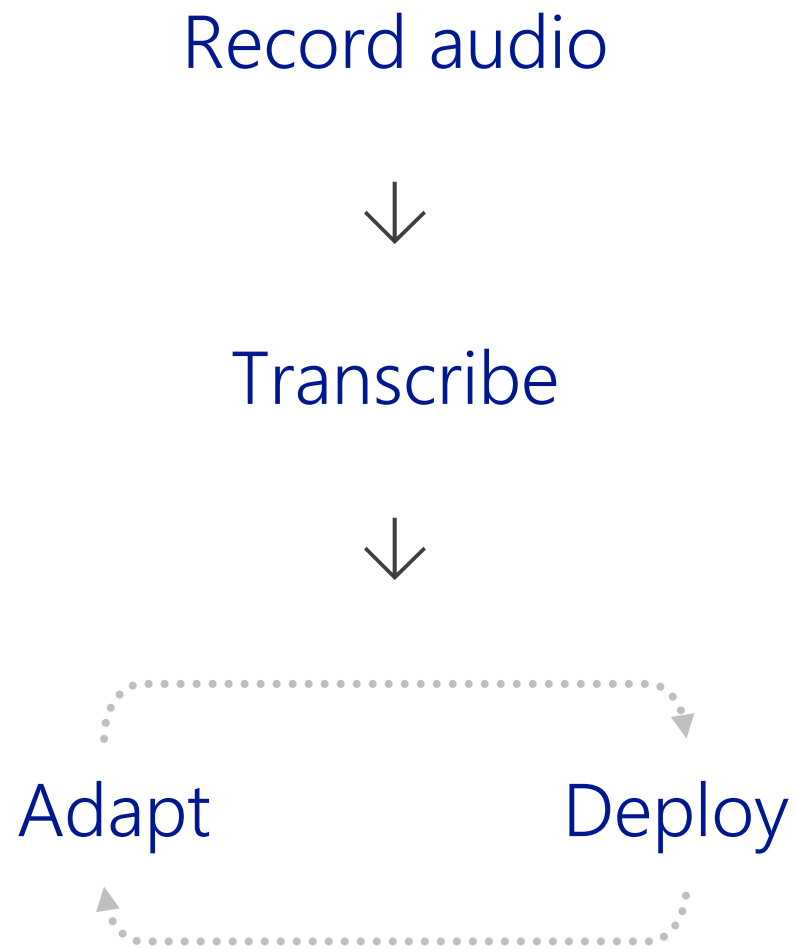
Convert spoken audio to intent

Custom Speech Service

Create custom language models for the vocabulary of the application

Adapt acoustic models to better match the expected environment of the application's users

Deploy to a custom endpoint and access from any device



Speaker Recognition API

Speaker verification
Check if two voices are the same

Speaker identification
Identify who is speaking

Speaker Recognition API

Enrollment

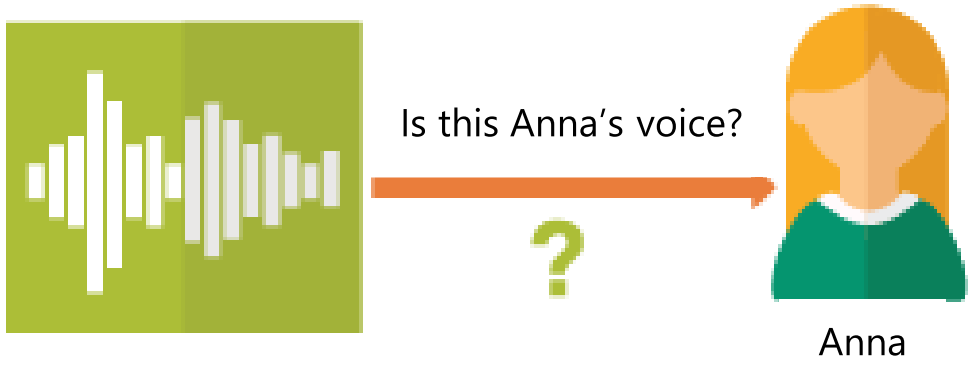
Create a unique voiceprint for a profile

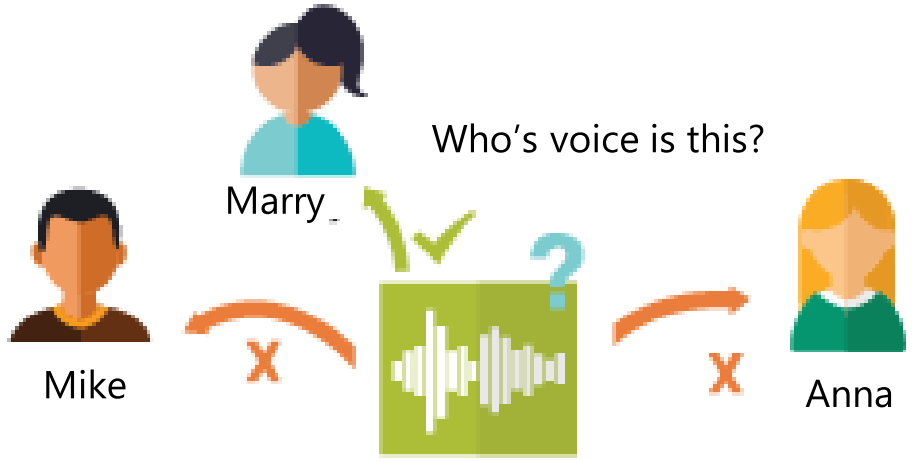
Recognition

After enrolling one or more voices, identify who is speaking from an audio clip

Verification

Confirm if a voice belongs to a previously enrolled profile





LANGUAGE

Process text and learn how to recognize what users want

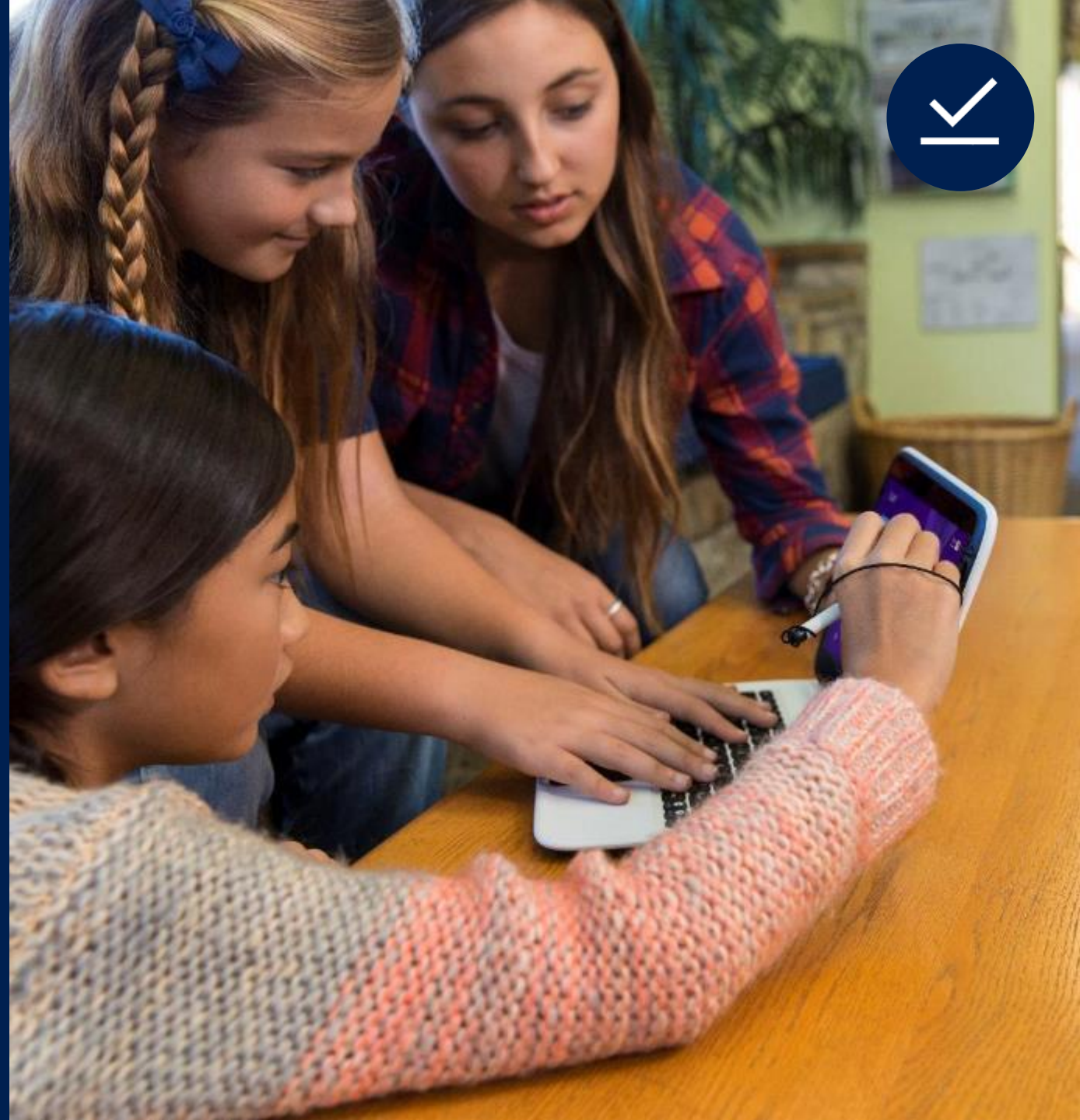
Bing Spell Check | Language Understanding | Linguistic Analysis | Text Analytics | Web Language Model | Translator Text and Speech

Bing spell check API

State-of-the-art cloud-based spelling algorithms
Recognizes a wide variety of spelling errors

Recognize name errors and homonyms in context
Difficult to spot errors that use the context of the words around them

Updates over time
Support for new brands and coined expressions as they emerge



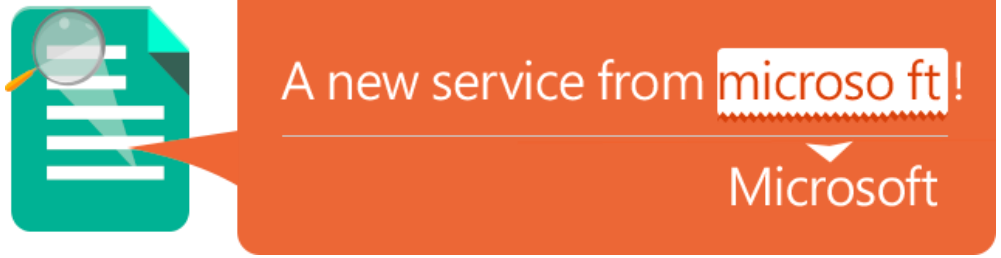
Bing spell check API

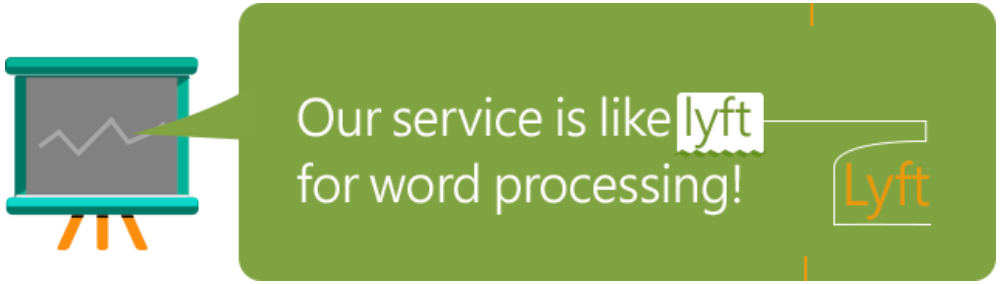
Check a single word or a whole sentence

"Our engineers developed this **four** you!"
Corrected Text: "four" → "for"

Identify errors & get suggestions

```
"spellingErrors": [
    {
       "offset": 5,
       "token": "gona",
       "type": "UnknownToken",
       "suggestions": [
            { "token": "gonna" }
    ] }
```





Language Understanding Intelligent Service

Understand what your users are saying

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

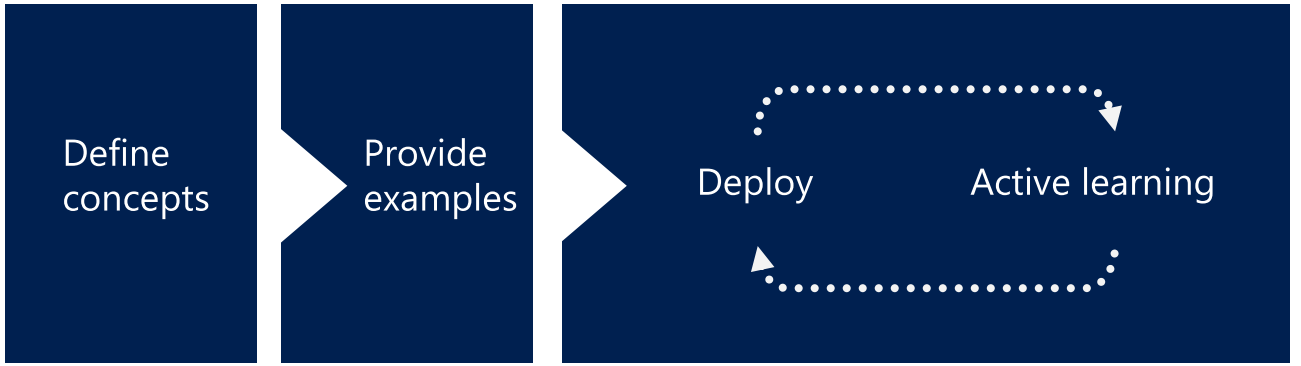
Language Understanding Intelligent Service

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
    }
  ]
}
```

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

Get started for free at http://azure.com/Cognitive

Learn more on the Cortana Intelligence Suite website and Cognitive Services website

Schedule a workshop to identify areas in your business where analytics and intelligence can drive transformation

Talk with your Microsoft contact about licensing options and partners

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

https://stackoverflow.com/questions/tagged/microsoft-cognitive
https://cognitive.uservoice.com/