Building Smart Apps with Microsoft Cognitive Services

Pierce Boggan
Software Engineer
Xamarin

Microsoft

Who is this guy?

Pierce Boggan

Software Engineer, Xamarin

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Microsoft

Microsoft Cognitive Services

Give your apps a human side

Microsoft

Cognitive Services API Collection

Vision

Computer Vision | Emotion | Face | Video

Speech

Computer Recognition | Speaker Recognition Speech | Translator

Language

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

Knowledge

Academic Knowledge | Entity Linking Knowledge Exploration | Recommendations

Search

Bing Autosuggest | Bing Image Search | Bing News Search | Bing Video Search | Bing Web Search

Why Microsoft Cognitive Services?

Easy

- Roll your own with REST APIs
- SDKs via NuGet for most 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

Tested

- Built by experts in their field from Microsoft Research, Bing, and Azure Machine Learning
- Quality documentation, code, samples, and support

Microsoft

Powerful models

Microsoft Cognitive Services' models are trained using the same deep learning and machine learning techniques that power many products across Microsoft.

Scenarios

A **sports team** allows fans to upload images during the game. Are they safe and clean to air ?

A **wildlife app** wants to separate animal and human pictures.

A **social networking app** wants to automatically tag friends in photos.

A **shopping app** wants product reviews to be available across all languages, for all users.

Microsoft

Vision

Computer Vision API

Distill actionable information from images

Face API

Detect, identify, analyze, organize, and tag faces in photos

Emotion API

Personalize experiences with emotion recognition

Video API

Analyze, edit, and process videos within your app

Microsoft

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	Blue

Microsoft

Face APIs

Detection

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

…

Feature Attributes

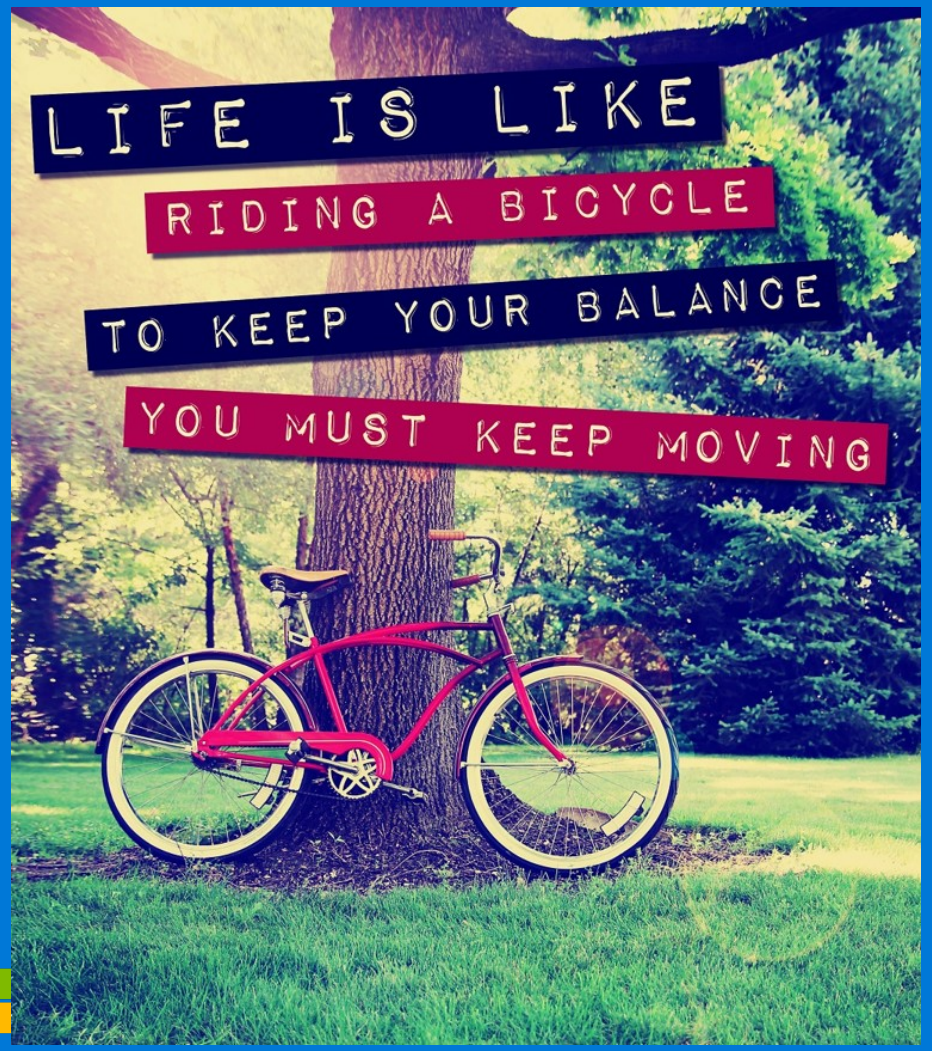
"attributes": { "age": 42, "gender": "male",
"headPose": { "roll": "8.2", "yaw": "-37.8", "pitch": "0.0" }}

Grouping

Identification

Jasper Williams

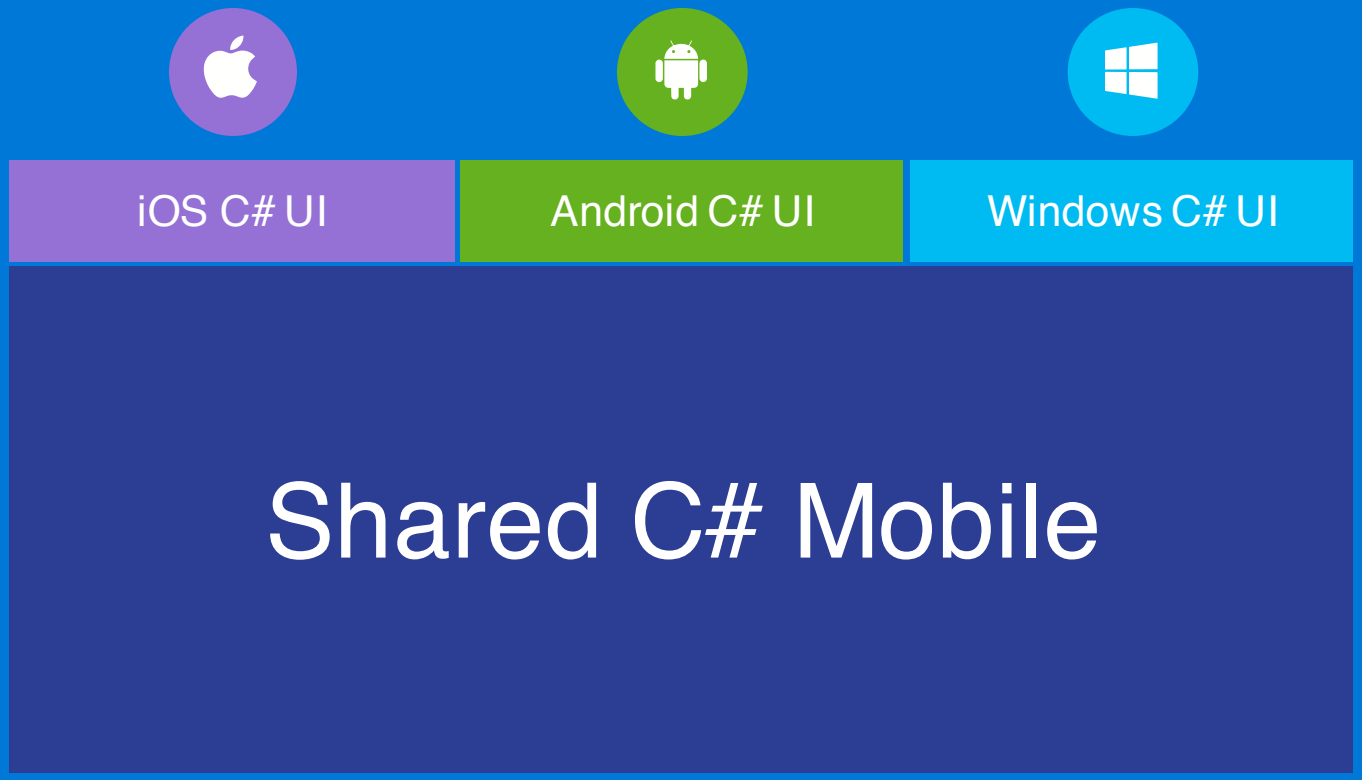
OCR



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"
      }
. . .
```

Xamarin's Unique Approach



Shared C# codebase • 100% native API access • High performance

Microsoft

Windows API

Microsoft.Phone	Microsoft.Networking	Windows.Storage	Windows.Foundation	Microsoft.Devices
System.Net	System	System.IO	System.Linq	System.Xml
System.Data	System.Windows	System.Numerics	System.Core	System.ServiceModel

Microsoft

iOS APIs

MapKit	UIKit	iBeacons	CoreGraphics	CoreMotion
System.Net	System	System.IO	System.Linq	System.Xml
System.Data	System.Windows	System.Numerics	System.Core	System.ServiceModel

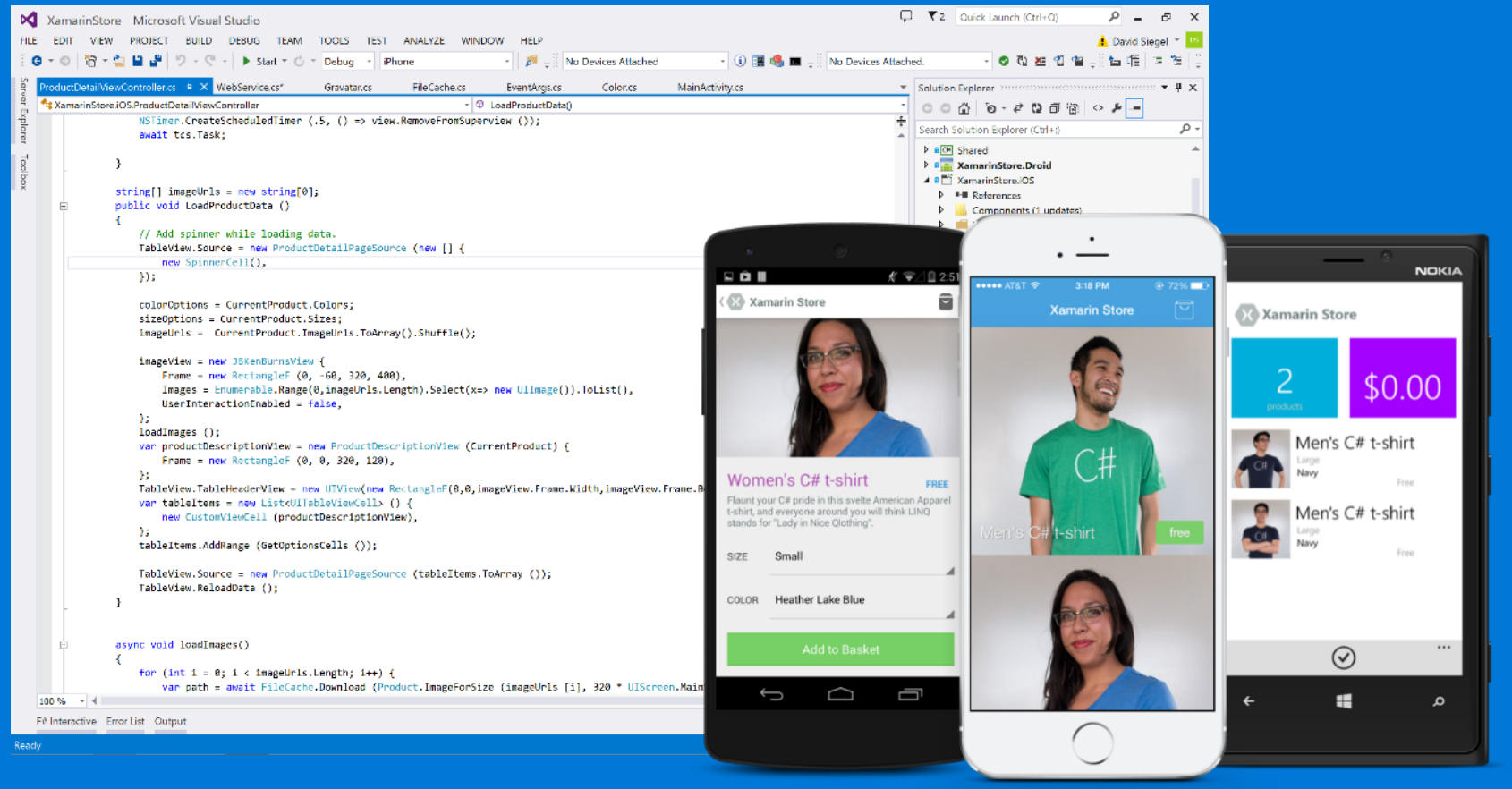
Microsoft

Android APIs

Text-to-speech	ActionBar	Printing Framework	Renderscript	NFC
System.Net	System	System.IO	System.Linq	System.Xml
System.Data	System.Windows	System.Numerics	System.Core	System.ServiceModel

Microsoft

Anything you can do in Objective-C, Swift, or Java can be done in C# and Visual Studio with Xamarin.



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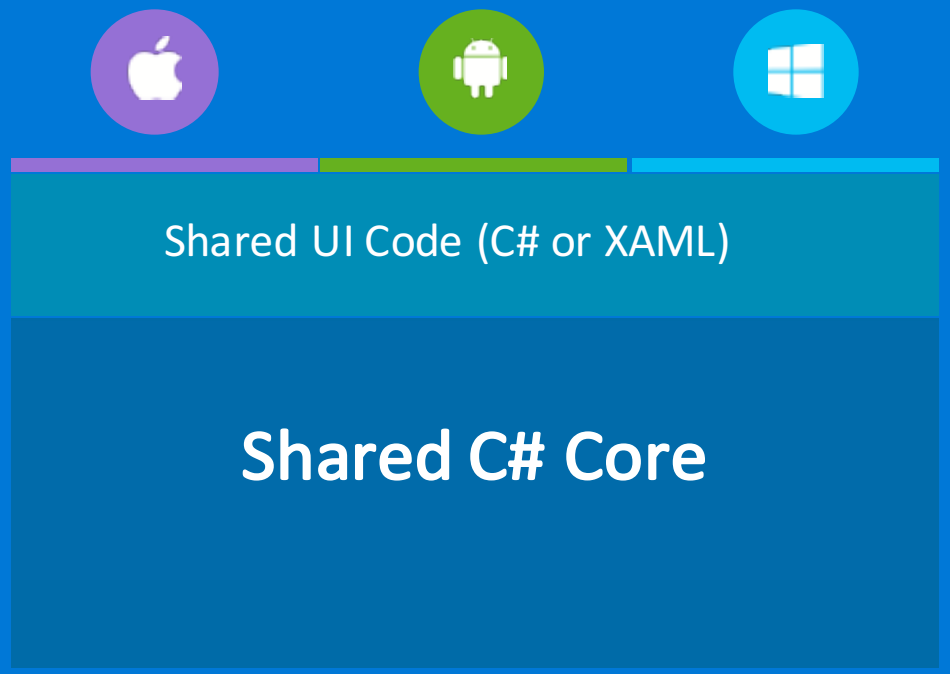
Xamarin + Xamarin.Forms

Traditional Xamarin

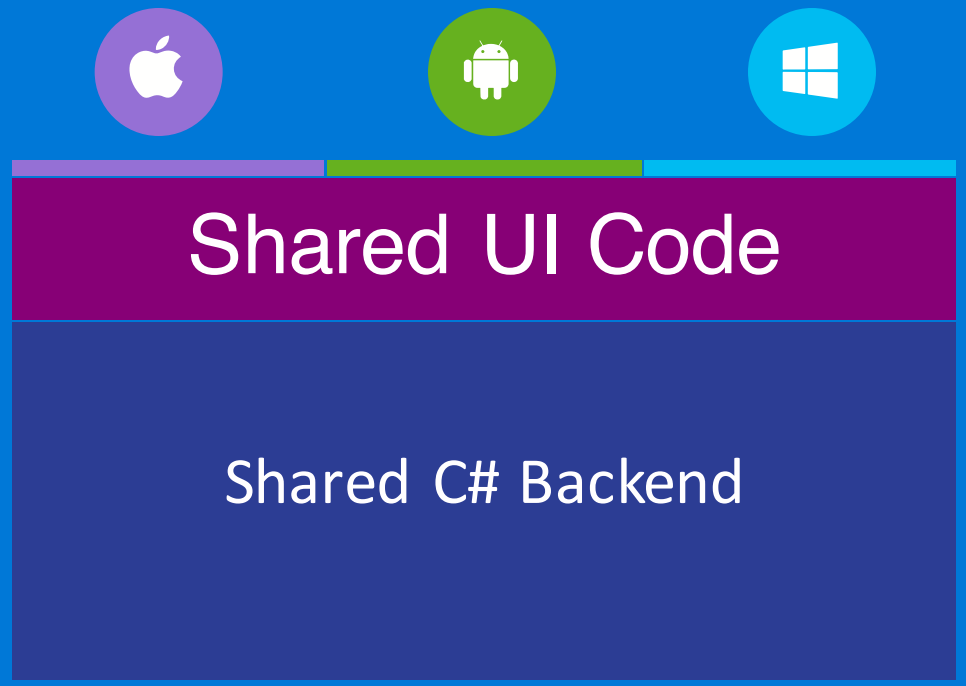


Xamarin.Forms

Shared C# codebase • 100% native API access • High performance

Microsoft

What’s included



- ✓ 40+ Pages, layouts, and controls
  (Build from code behind or XAML)
- ✓ Two-way data binding
- ✓ Navigation
- ✓ Animation API
- ✓ Dependency Service
- ✓ Messaging Center

Microsoft

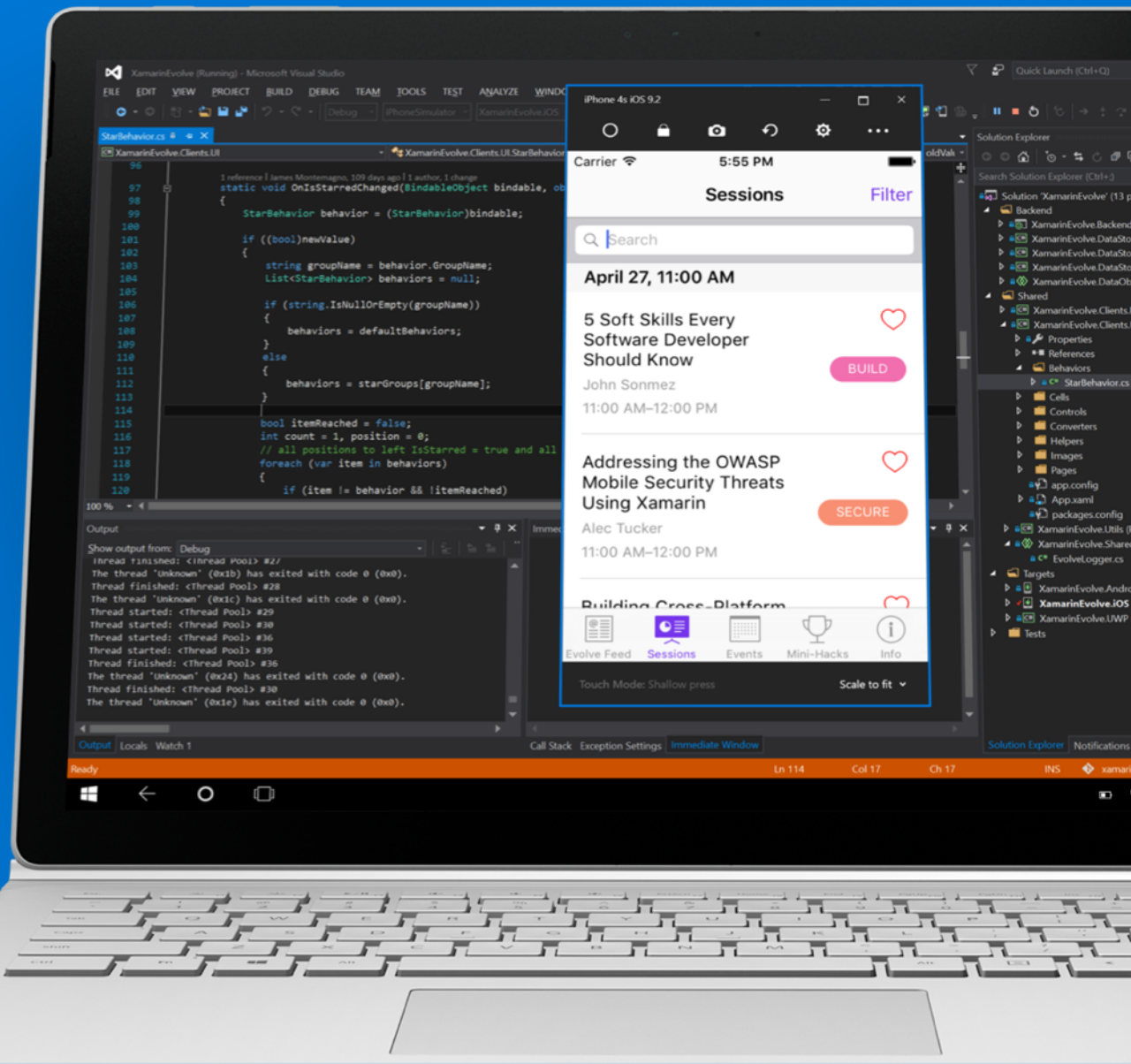
Xamarin is **included** in Visual Studio!
(and open source)

Microsoft

Visual Studio iOS Simulator Remoting

- Multi-Touch Enabled
- Pressure Sensitive
- Super Fast
- Rotate, screenshots, location changes
- Never leave VS

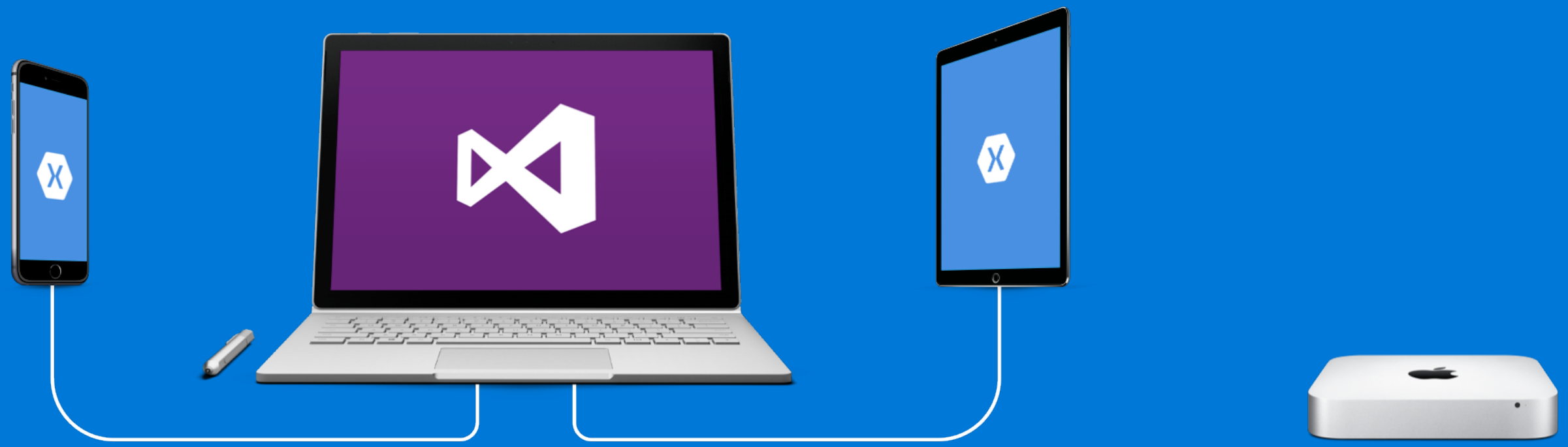
(currently in preview)



Microsoft

Visual Studio iOS USB Remoting

(coming soon)



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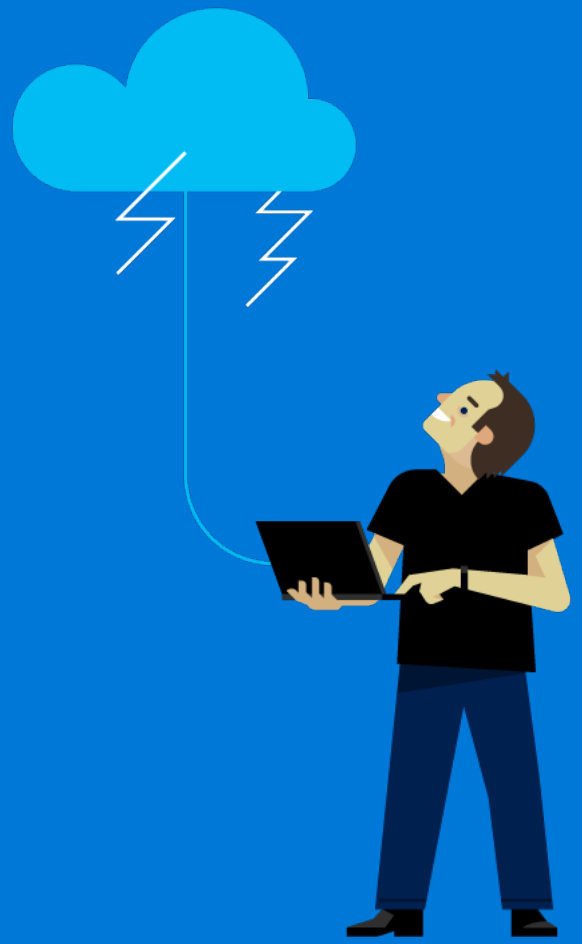
Vision APIs Demo



Microsoft

Speech

Bing Speech API

Convert speech to text and back again, and understand its intent

Speaker Recognition API

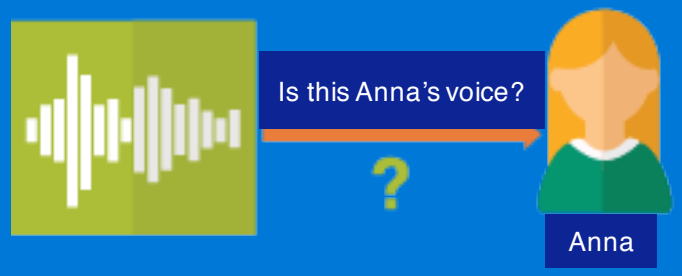
Give your app the ability to know who's talking

Custom Recognition Intelligent Service

Fine-tune speech recognition for anyone, anywhere

Microsoft

Speaker Recognition APIs



Enrollment

Create a unique voiceprint for a profile

Recognition

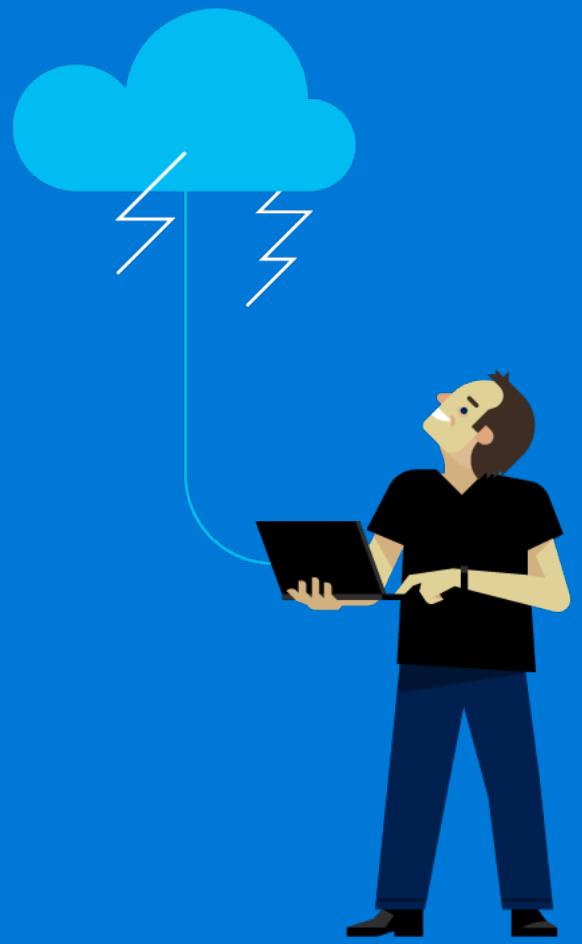
After enrolling one or more voices, identify who is speaking from an audio clip

Verification

Confirm if a voice belongs to a previously enrolled profile

Microsoft

Speech APIs Demo



Microsoft

Language

Bing Spell Check API

Detect and correct spelling mistakes within your app

Web Language Model API

Leverage the power of language models trained on web-scale data

Linguistic Analysis API

Easily parse complex text with language analysis

Language Understanding Intelligent Service

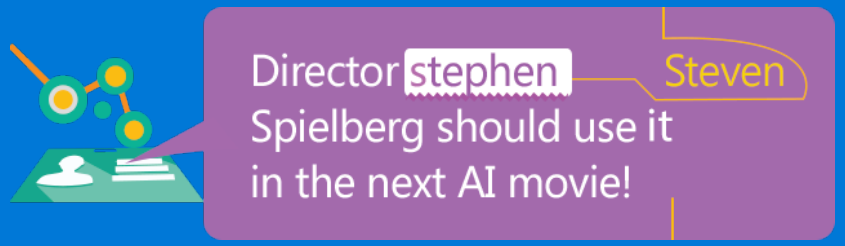
Teach your apps to understand commands from your users

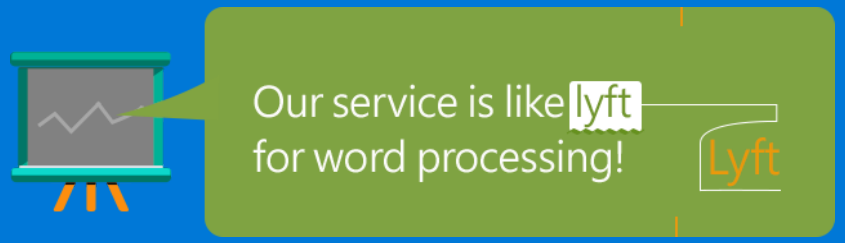
Text Analytics API

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

Microsoft

Spell Check APIs





Check a single word or a whole sentence

"Our engineers developed this **four** you!"

Corrected Text: "four" → "for"

Identify errors and get suggestions


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


Microsoft

LUIS

Understand what your users are saying

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

Language Understanding Models

```
{
  “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
    }
  ]
}
```

Search

Bing Web Search API

Connect powerful search to your apps

Bing Autosuggest API

Give your app intelligent autosuggest options for searches

Bing Image Search API

Bring advanced image and metadata search to your app

Bing Video Search API

Trending videos, detailed metadata, and rich results

Bing News Search API

Link your users to robust and timely news searches

Microsoft

Knowledge

Academic Knowledge API

Explore relationships among academic papers, journals, and authors

Knowledge Exploration Service

Add interactive search over structured data to your project

Entity Linking Service

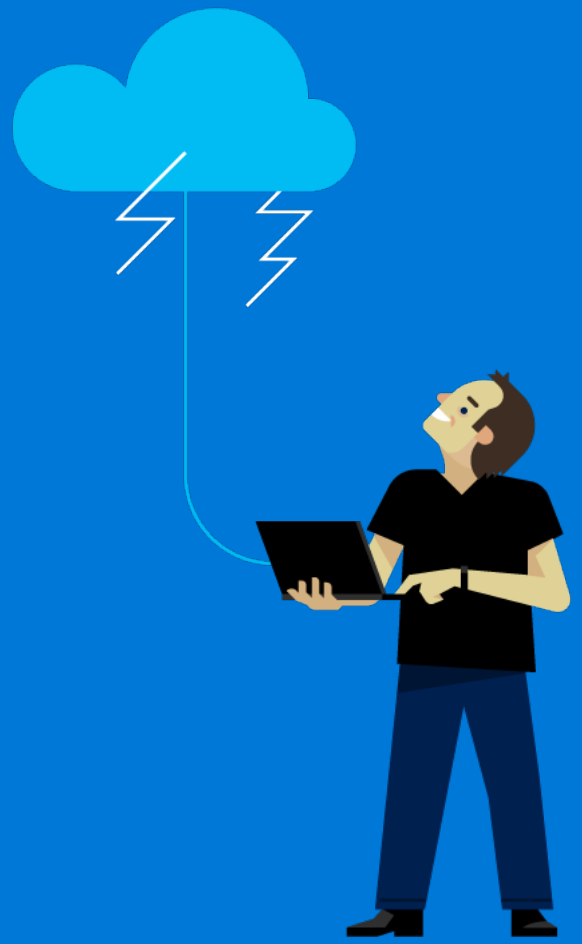
Contextually extend knowledge of people, locations, and events

Recommendations API

Provide personalized product recommendations for your customers

Microsoft

Knowledge APIs Demo



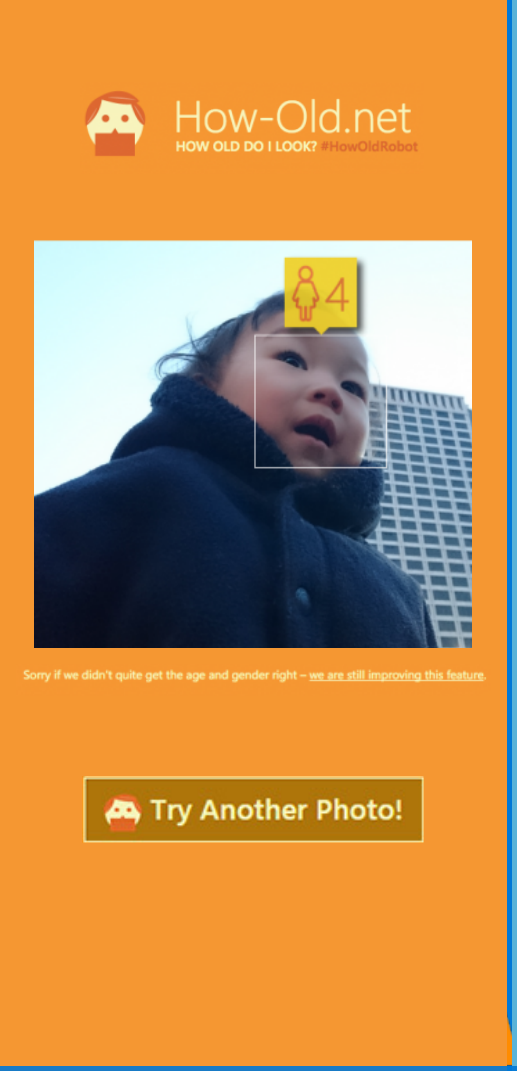
Microsoft

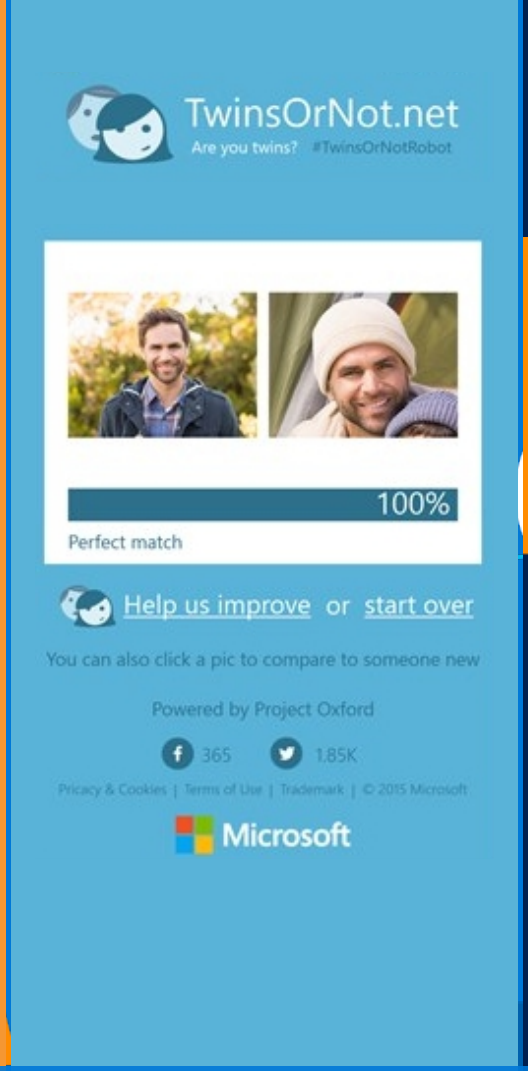
Microsoft Cognitive Services: Introducing the Seeing AI app

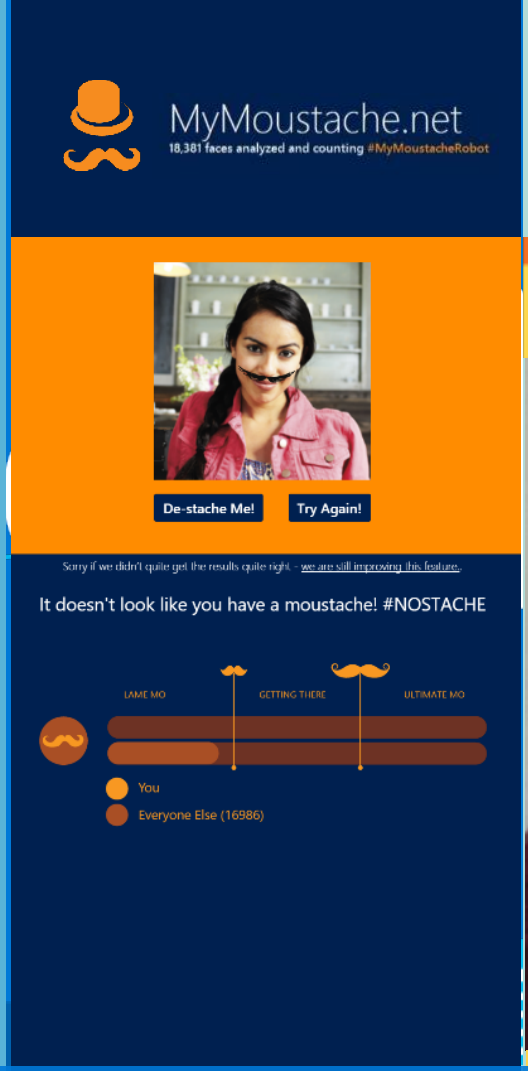
At Build, Microsoft previewed Seeing AI, a research project that helps people who are visually impaired or blind to understand who and what is around them.

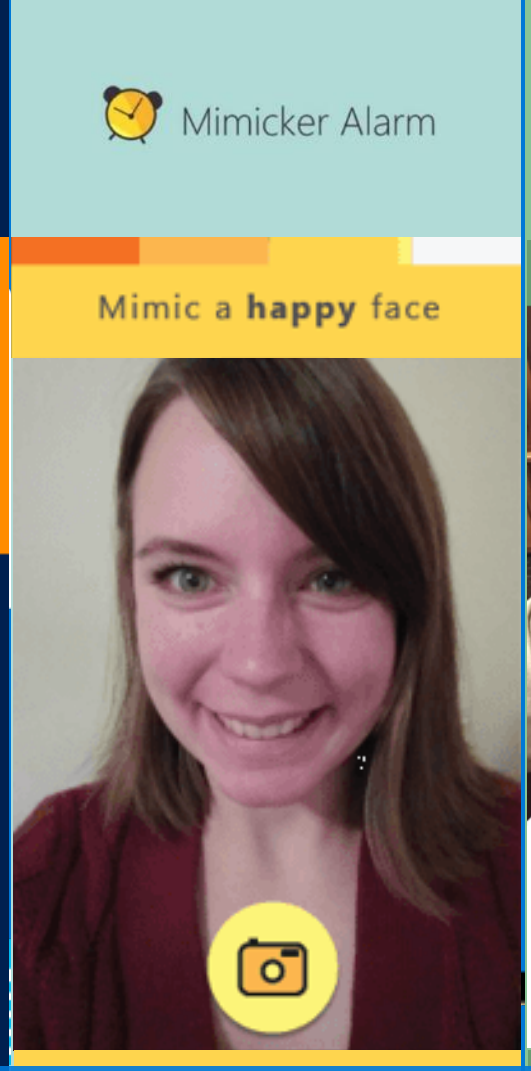
The app will use computer vision, image & speech recognition, natural language processing and machine learning from Microsoft Cognitive Services and technology from Office Lens.

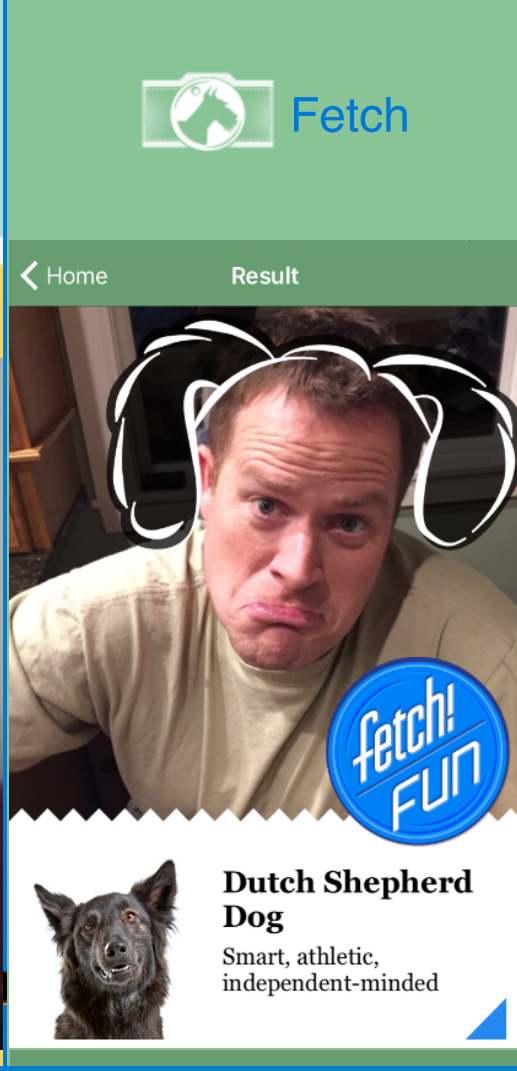
The app is currently under development.











showcase apps

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microsoft.com/cognitive

Get started today at xamarin.com

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Unrivaled Mobile Development Training

Live unlimited mobile development training from mobile experts, in your time-zone, on your schedule, and as often as you'd like.

Free self-guided learning / five prerecorded classes (via VS Dev Essentials)

Microsoft

Thank you! Questions?

Slides and code available @pierceboggan

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Software Engineer, Xamarin

Microsoft @pierceboggan