

**Beam Me Up,
Scotty**





**Make your
applications intelligent**
Michał Jankowski



about me



Michał Jankowski



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aim.

Learn how you can enhance
your products with AI
by using Cognitive Services



Have you worked with Azure yet?



Have you worked with Cognitive Services yet?

the agenda

1

why

AI is so important right now?

2

what

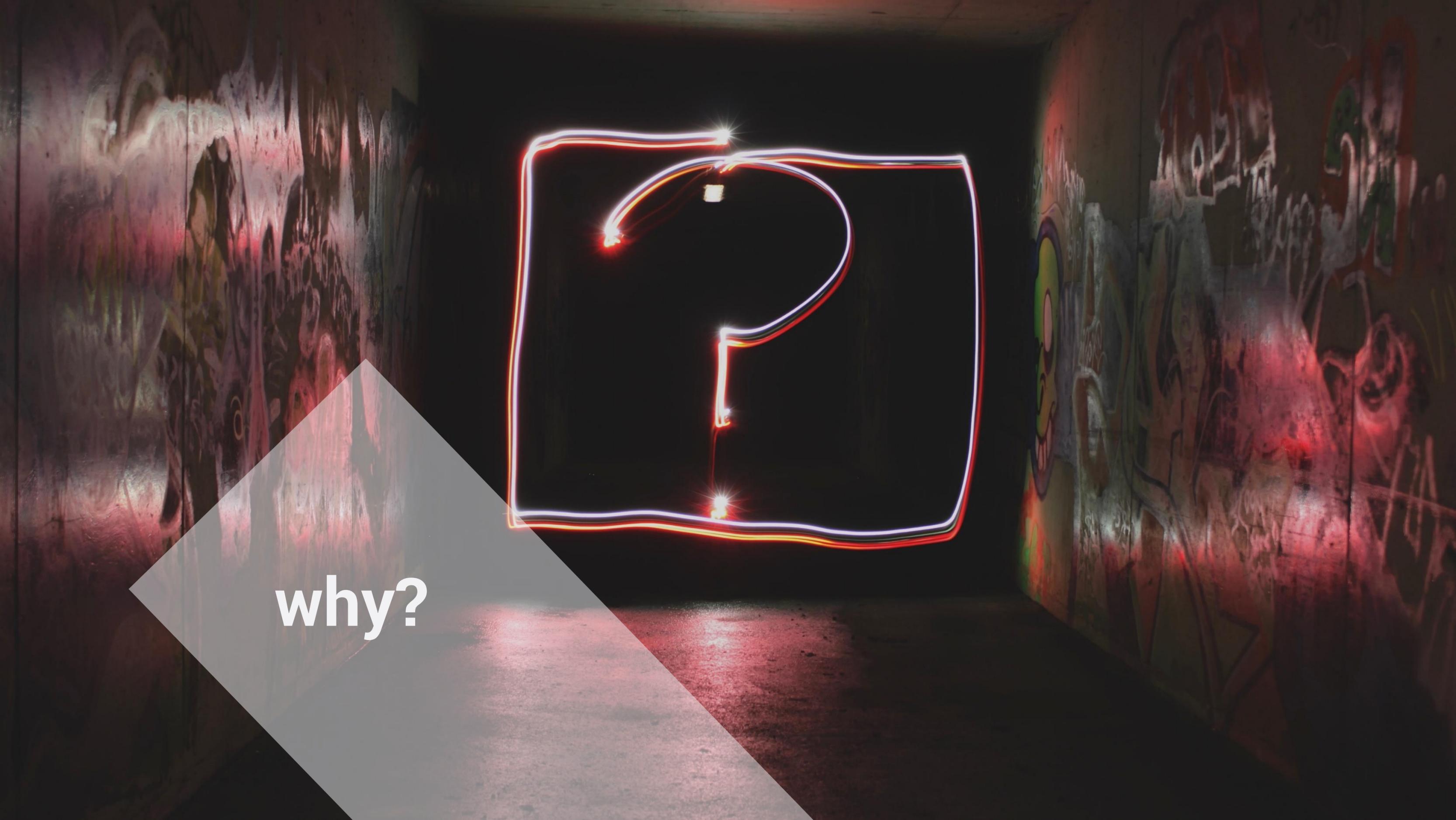
can we do with it?

3

how

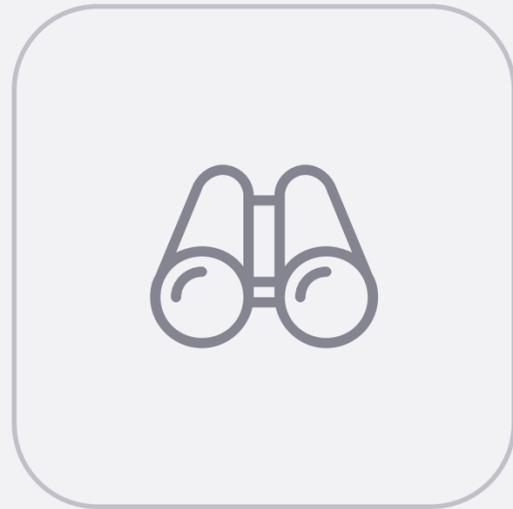
can we develop solution?





why?

artificial intelligence



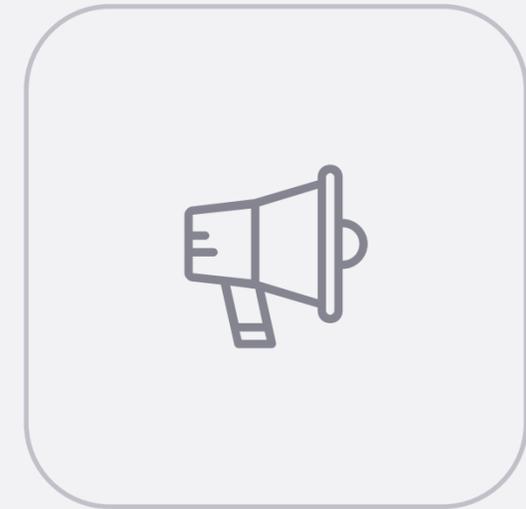
reasoning

Learn and from the conclusion with imperfect data.



understanding

Interpret the meaning of data including text, voices & images.



interacting

Interact with people in natural ways.

can you see the value

Newcastle City Council

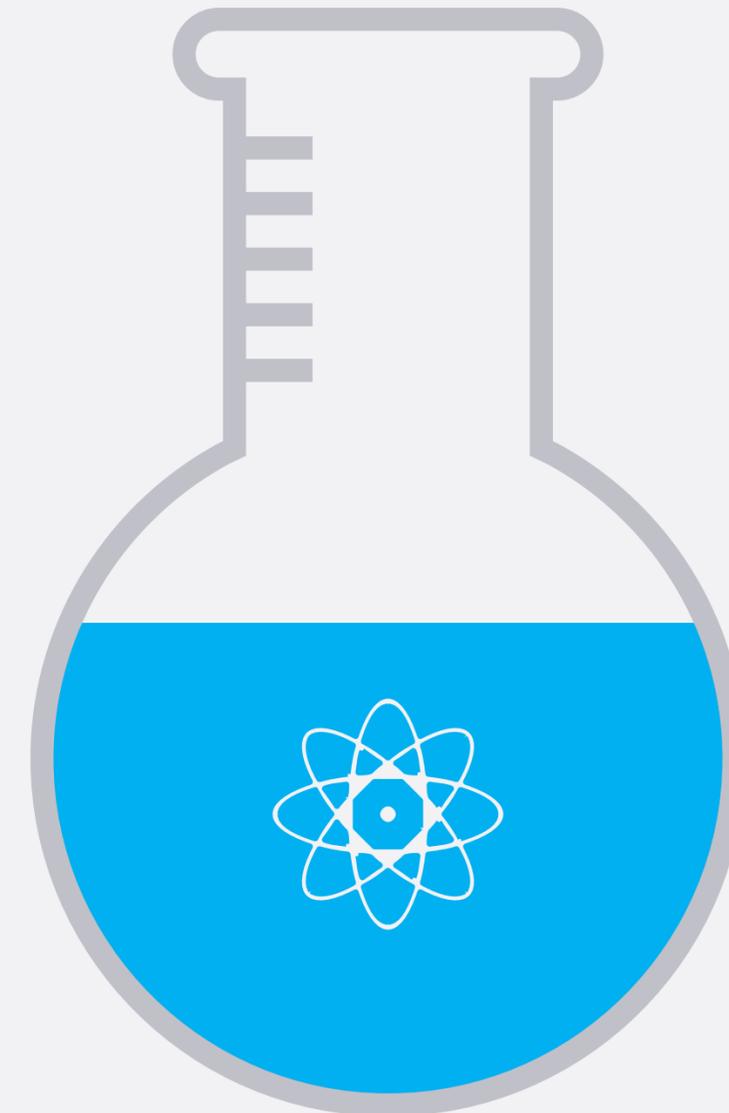
„Our WasteBot has turned the process of applying to take household waste to the tip, which could take up to two weeks, into 90-seconds task”, Jenny Nelson

Centrica / British Gas

„... has cut down mistakes by half and helps our operatives focus on what they are best at: great customer service”, Mike Young

Seadrill

„This enhances safety onboard, makes our operation more efficient and ultimately, be more predictable in the delivery of quality wells for our customers”, Kaveh Pourteymour





what can go wrong?



Great AI needs great data. But if you start by asking 'what data have we got?', you are predisposed to the solution. Much better to start at the business problem, then see if you have the right data to tackle it.

Norm Judah, Microsoft CTO

it happened
to me

story of one package

First, the very positive impression transformed into frustration and
angriness.

FRAGILE

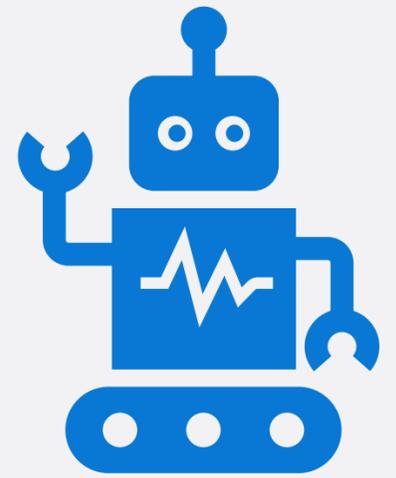


what?



machine learning / AI tools

when to use what?

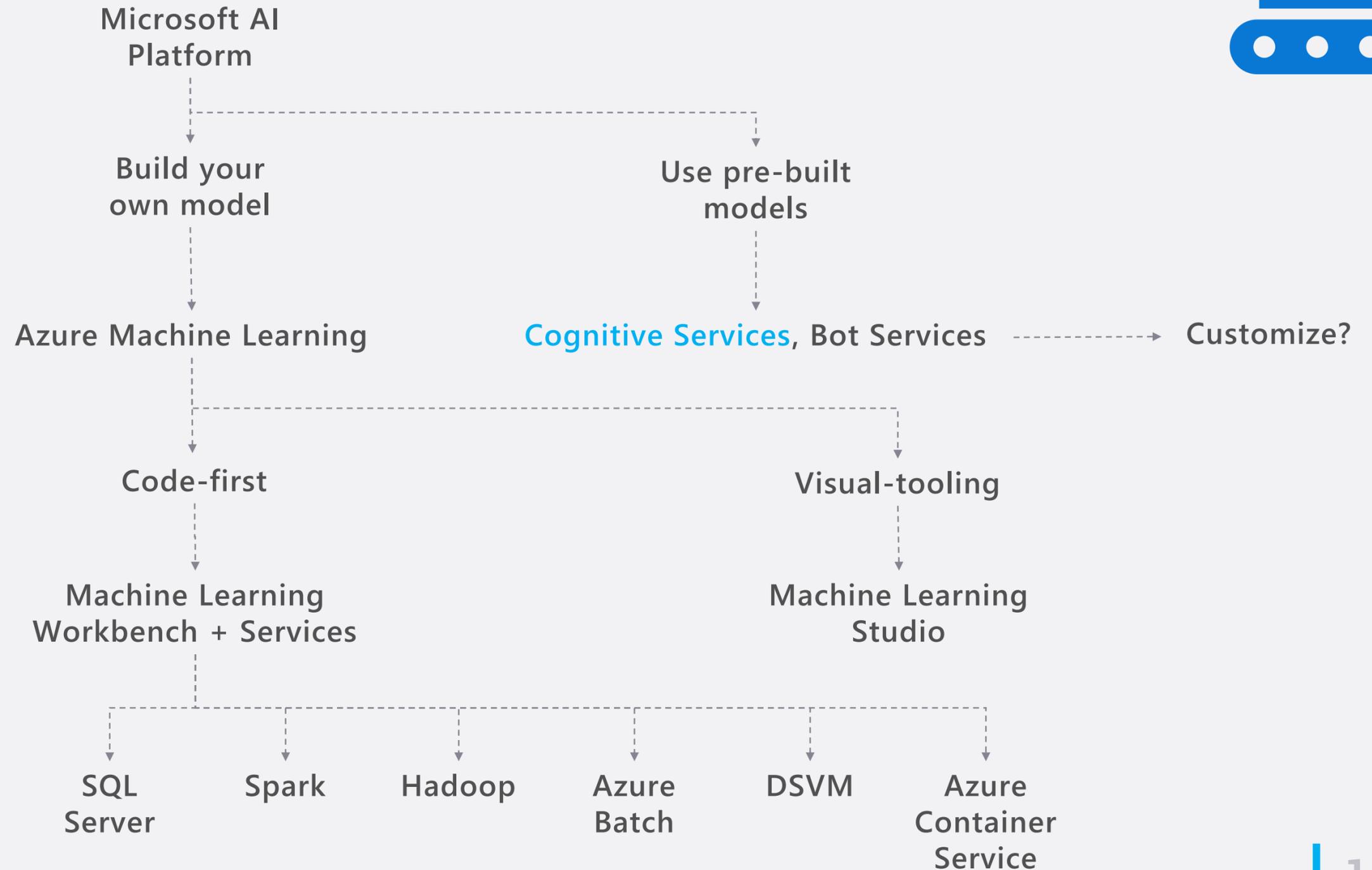


Build your own or consume pre-trained models?

Which experience do you want?

Tools & Services

What engine(s) do you want to use?



cognitive services



vision

- ✓ Computer vision
- ✓ Face
- ✓ Ink Recogniser
- ✓ Video Indexer
- ✓ Custom Vision
- ✓ Form Recogniser



speech

- Speech to Text
- Speaker Recognition
- Text to Speech
- Speech Translation



language

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



decision

- Content Moderator
- Anomaly Detector
- Personaliser



search

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

demo

1.



ideas.

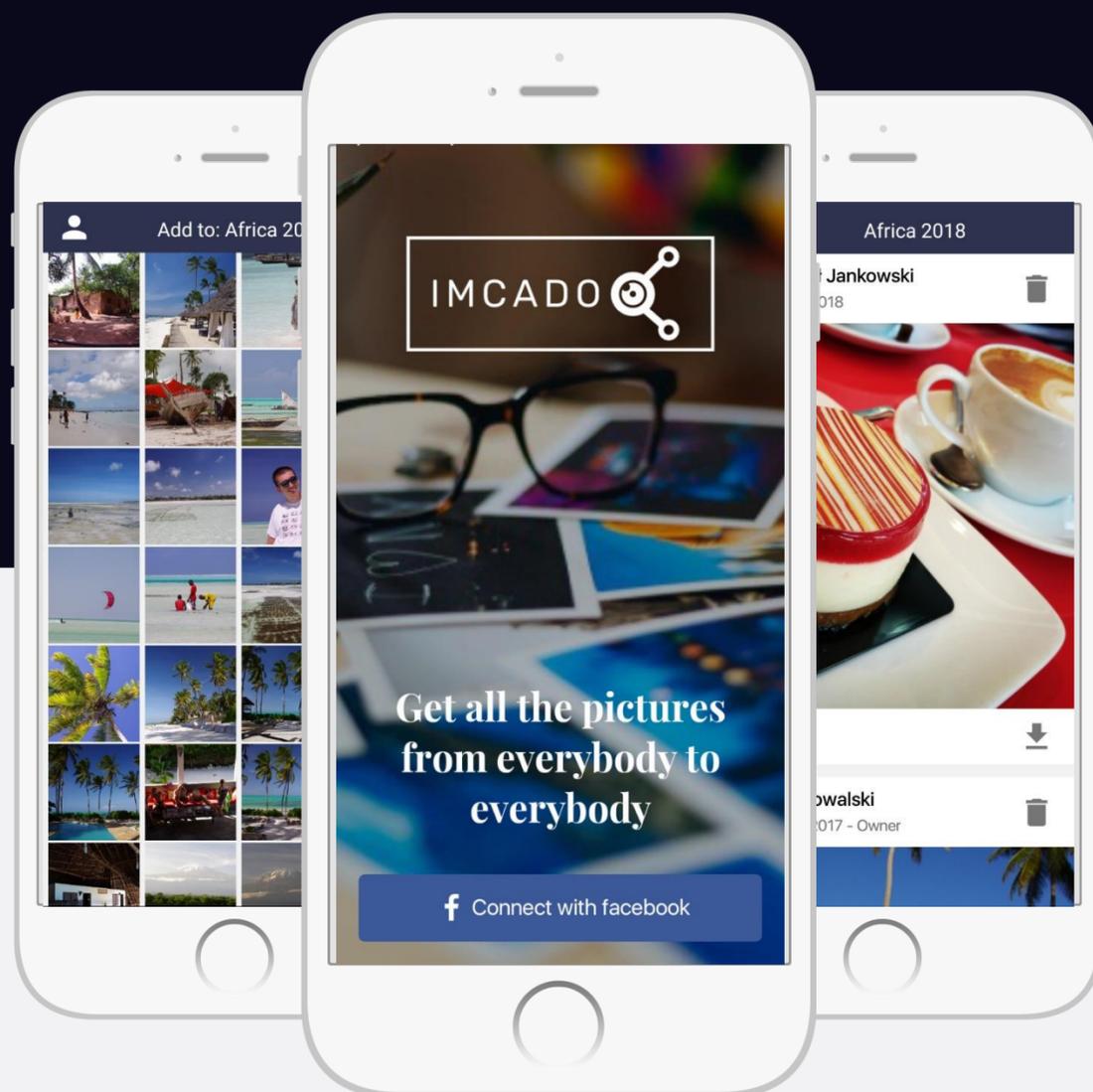


The Uber logo, consisting of the word "uber." in a lowercase, sans-serif font, is displayed in a light blue color. It is enclosed within a white L-shaped bracket that forms a partial frame around the text.

Uber improves security by **facial recognition** software. It reduced situation that drivers were sharing their app to others.

And for **passengers**, they are sure that the driver ID has been checked.



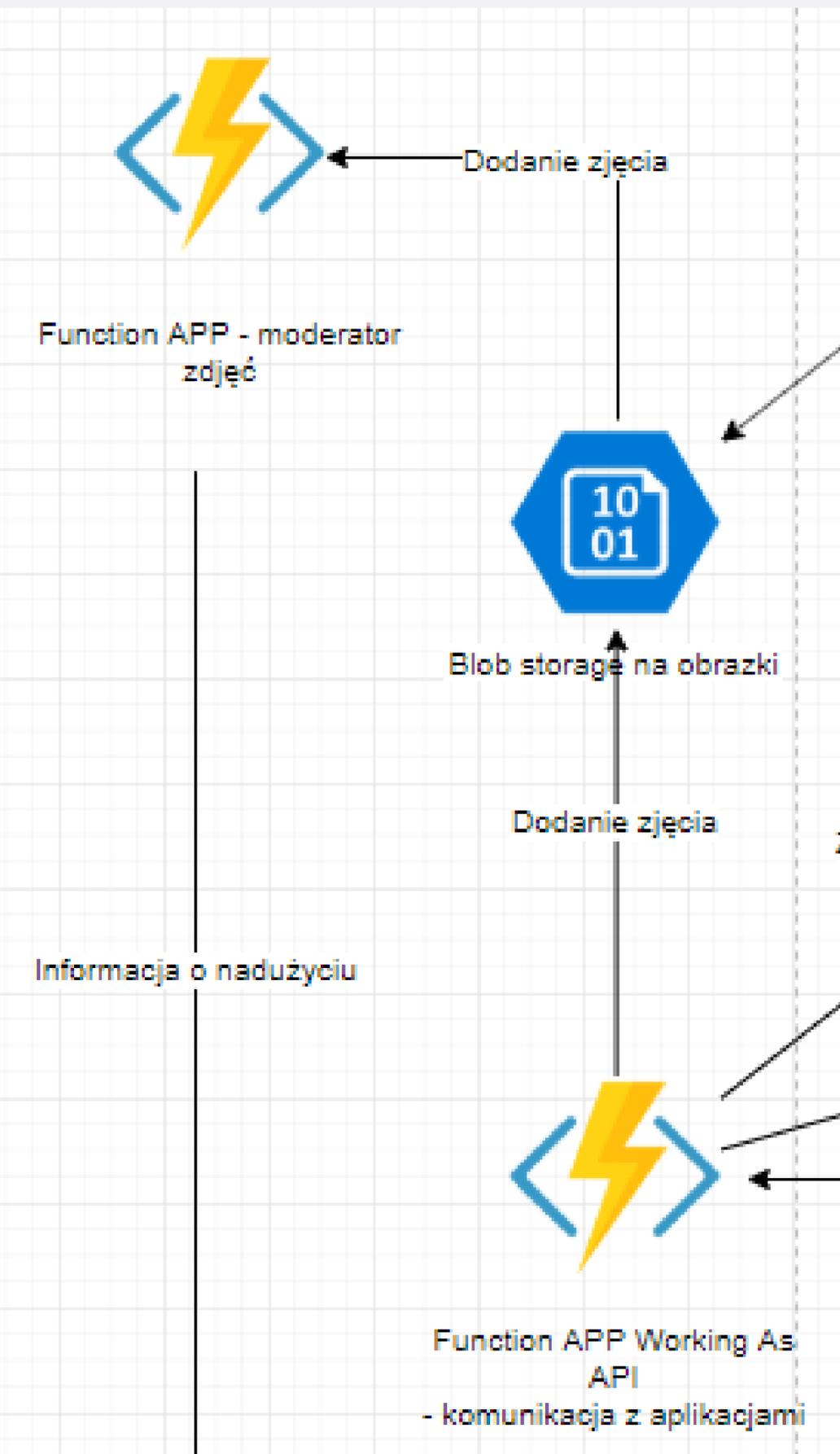
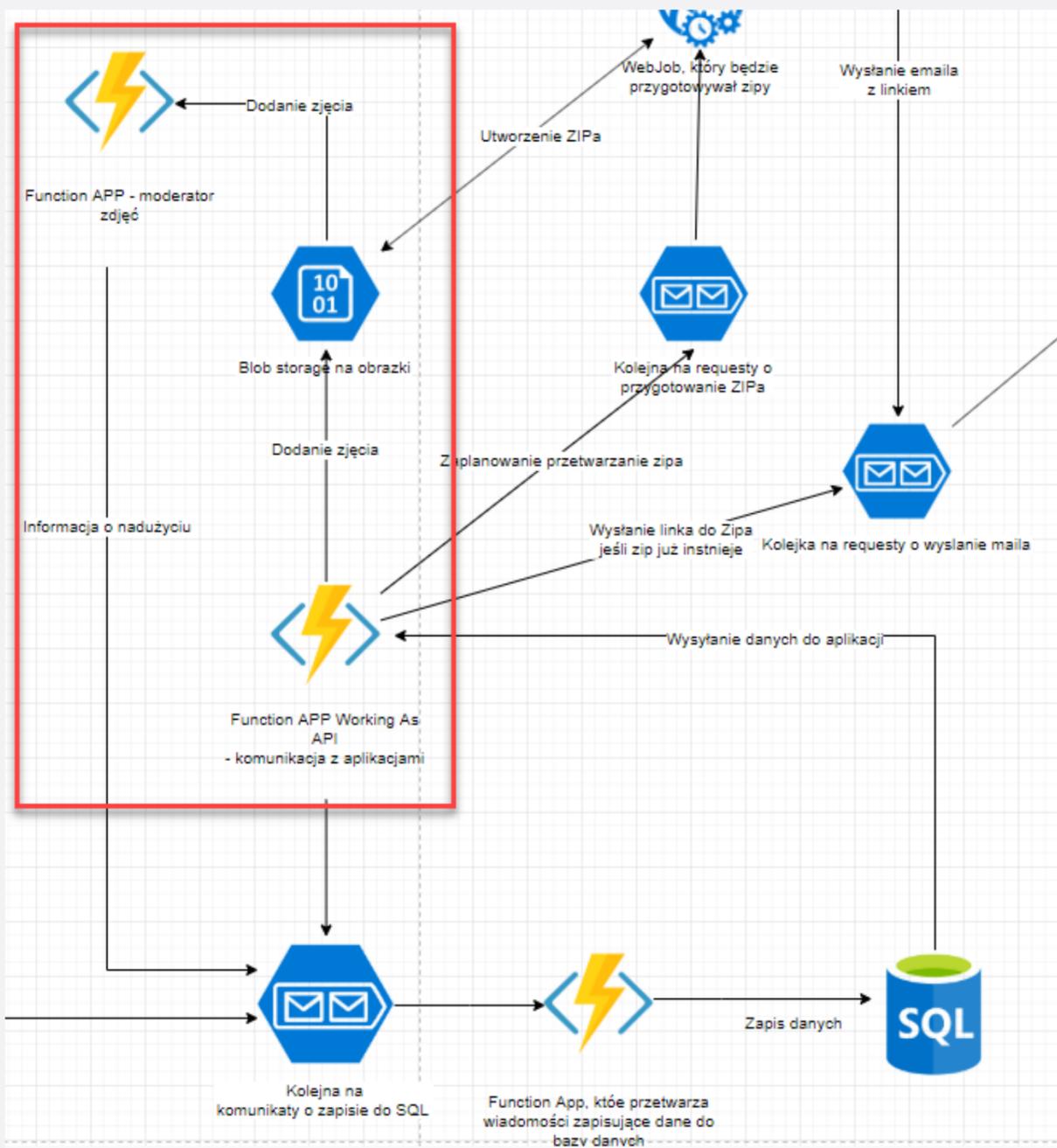


sharing has never been so simple

Imcado helps you with sharing photos between the group of people you are spending time. It has never been easier! Just create an event - e.g. like holidays. Invite your friends and start sharing your pictures. And when you get back, everybody will be able to get all pictures by one click.

- | How to not become another porn site?
- | Should we block all nude photos?
- | What about child abuse?

imcado architecture



$$\omega = 2\pi f \quad \beta = \frac{\Delta I_c}{\Delta I_b} \quad V = \frac{q}{A}$$

$$\frac{\sin \alpha}{\sin \beta} = \frac{v_1}{v_2} = \frac{\omega_2}{\omega_1} \quad v = \frac{1}{\sqrt{\epsilon \mu}} = \frac{c}{\sqrt{\epsilon_r \mu_r}}$$

$$R = \rho \frac{L}{S}$$

$$\tau = \frac{L \mu_r}{T}$$

$$E = mc^2$$

$$M = \vec{F} d \cos \alpha \quad F_v = \left\{ \frac{F_n}{R} \right. \quad x^* T = G$$

$$F_n = \sin \theta g \quad F_g = \frac{m_1 m_2}{r^2} \quad \gamma \quad E = \frac{Ec}{q}$$

$$\cos(\theta_1 - \theta_2) = \cos \theta_1 \cos \theta_2 + \sin \theta_1 \sin \theta_2$$

how



demo

2.

computer vision pricing

Cognitive Services

API: Computer Vision REGION: West Europe INSTANCE: Free

5,000 included transactions.

= \$0.00

computer vision pricing

Cognitive Services

API: Computer Vision REGION: West Europe INSTANCE: Free

5,000 included transactions.

= \$0.00

Cognitive Services

API: Computer Vision REGION: West Europe INSTANCE: S1

Up to 10 transactions per second.

Features
Tag, Face, GetThumbnail Color, Image Type

1000 Transactions = \$1.00

OCR, Adult, Celebrity, and Landmark

1000 Transactions = \$1.50

Describe and Recognize Text

1000 Transactions × \$2.50 Per 1,000 transactions = \$2.50

Sub-total \$5.00

computer vision pricing

Cognitive Services

API: Computer Vision REGION: West Europe INSTANCE: Free

5,000 included transactions.

= \$0.00

Cognitive Services

API: Computer Vision REGION: West Europe INSTANCE: S1

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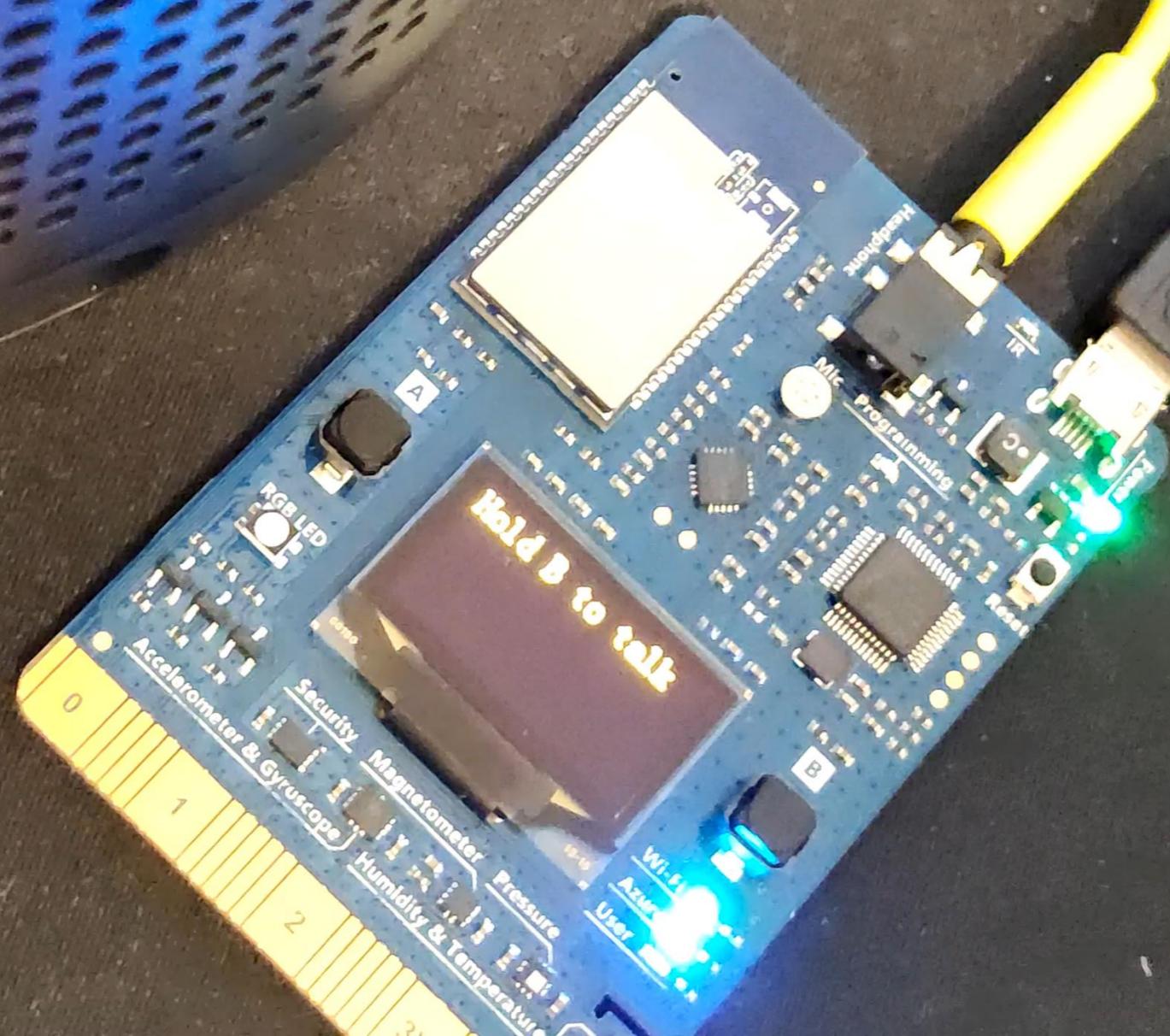
```
List<VisualFeatureTypes> features = new List<VisualFeatureTypes>()  
{  
    VisualFeatureTypes.Adult,  
    VisualFeatureTypes.Brands,  
    VisualFeatureTypes.Faces,  
    VisualFeatureTypes.Color  
};
```

A scene from the movie Star Trek: The Undiscovered Country. In the center, a Klingon character with grey, spiky hair and a serious expression is holding a black handheld device to his ear. He is wearing a red Starfleet uniform with a gold Klingon insignia on the chest. To his right, another Klingon character with similar features is also holding a device to his ear. On the left, the back of a Klingon head is visible. The background is a dark, blueish-grey. A semi-transparent grey triangle is overlaid on the left side of the image, containing the text 'universal translator'.

**universal
translator**

the device





Create

All Cognitive Services

* Name

universaltranslator

* Subscription

Microsoft Azure Sponsorship

* Location

(Europe) West Europe



Location specifies the region only for included regional services. This does not specify a region for included non-regional services. [See service status page](#) for more details.

* Pricing tier ([View full pricing details](#))

S0

* Resource group

Cognitive_UniversalTranslator

[Create new](#)

* I confirm I have read and understood the notice below.

Microsoft will use data you send to Bing Search Services to improve Microsoft products and services. Where you send personal data to this service, you

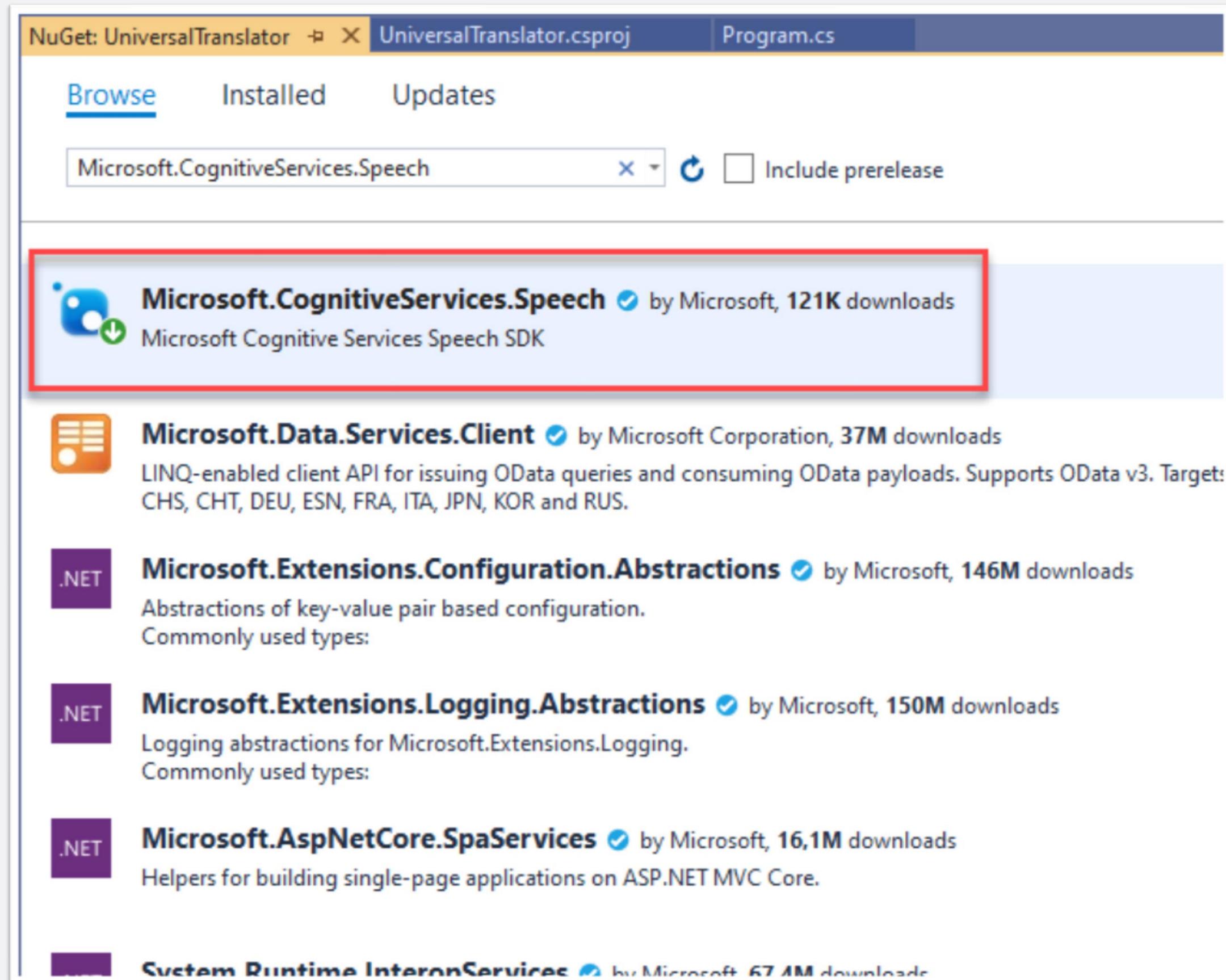
Please refer to the [Online Services Terms](#) for details. Microsoft offers [policy controls](#) that may be used to disable new deployments.

service creation

01

nuget package instalation

02



The screenshot shows the NuGet package manager interface. At the top, there are tabs for 'Browse', 'Installed', and 'Updates'. Below the tabs is a search bar containing 'Microsoft.CognitiveServices.Speech' and a search icon. To the right of the search bar is a checkbox labeled 'Include prerelease'. The search results are displayed in a list. The first result, 'Microsoft.CognitiveServices.Speech', is highlighted with a red border. It is a package by Microsoft with 121K downloads. Below it are other packages: 'Microsoft.Data.Services.Client' (37M downloads), 'Microsoft.Extensions.Configuration.Abstractions' (146M downloads), 'Microsoft.Extensions.Logging.Abstractions' (150M downloads), 'Microsoft.AspNetCore.SpaServices' (16,1M downloads), and 'System.Runtime.InteropServices' (67,4M downloads).

NuGet: UniversalTranslator - X UniversalTranslator.csproj Program.cs

[Browse](#) Installed Updates

Microsoft.CognitiveServices.Speech x ↕ Include prerelease

 **Microsoft.CognitiveServices.Speech** ✓ by Microsoft, 121K downloads
Microsoft Cognitive Services Speech SDK

 **Microsoft.Data.Services.Client** ✓ by Microsoft Corporation, 37M downloads
LINQ-enabled client API for issuing OData queries and consuming OData payloads. Supports OData v3. Target: CHS, CHT, DEU, ESN, FRA, ITA, JPN, KOR and RUS.

 **Microsoft.Extensions.Configuration.Abstractions** ✓ by Microsoft, 146M downloads
Abstractions of key-value pair based configuration.
Commonly used types:

 **Microsoft.Extensions.Logging.Abstractions** ✓ by Microsoft, 150M downloads
Logging abstractions for Microsoft.Extensions.Logging.
Commonly used types:

 **Microsoft.AspNetCore.SpaServices** ✓ by Microsoft, 16,1M downloads
Helpers for building single-page applications on ASP.NET MVC Core.

 **System.Runtime.InteropServices** ✓ by Microsoft, 67,4M downloads

03

UniversalTranslator - Keys
Cognitive Services

Search (Ctrl+/)

- Overview
- Activity log
- Access control (IAM)
- Tags
- Diagnose and solve problems
- Keys**
- Quick start
- Pricing tier
- Billing and subscription

Regenerate Key1 Regenerate Key2

NAME
UniversalTranslator

These subscription keys are used to access your service.

KEY 1
0a3fe9...f0dd

KEY 2
e1fee2...c8e58

```
public static void ConfigureApplication()
{
    // Supported languages https://docs.microsoft.com/en-us/azure/cognitive-services/speech-service/language-support
    string from = "en-US";
    string to = "de-DE";

    speechTranslationConfig = SpeechTranslationConfig.FromSubscription("0a3fe9...f0dd", "WestEurope");
    speechTranslationConfig.SpeechRecognitionLanguage = from;
    speechTranslationConfig.AddTargetLanguage(to);

    speechConfig = SpeechConfig.FromSubscription("0a3fe9...f0dd", "WestEurope");
    speechConfig.SpeechSynthesisLanguage = to;
}
```

**solution
configuration**

text to speech

04

```
public static async Task ReadTextAsync(string text)
{
    using (var synthesizer = new SpeechSynthesizer(speechConfig))
    {
        await synthesizer.SpeakTextAsync(text);
    }
}
```

translation

```
public static async Task TranslationContinuousRecognitionAsync()
{
    using (var recognizer = new TranslationRecognizer(speechTranslationConfig))
    {
        recognizer.Recognized += (s, e) =>
        {
            Console.WriteLine($"\\nRECOGNIZED: {e.Result.Text}");
            foreach (var element in e.Result.Translations)
            {
                Console.WriteLine($"    TRANSLATED into '{element.Key}': {element.Value}");
                ReadTextAsync(element.Value).Wait();
            }
        };

        Console.WriteLine("Say something...");
        await recognizer.StartContinuousRecognitionAsync().ConfigureAwait(false);

        do
        {
            Console.WriteLine("Press Enter to stop");
        } while (Console.ReadKey().Key != ConsoleKey.Enter);

        await recognizer.StopContinuousRecognitionAsync().ConfigureAwait(false);
    }
}
```

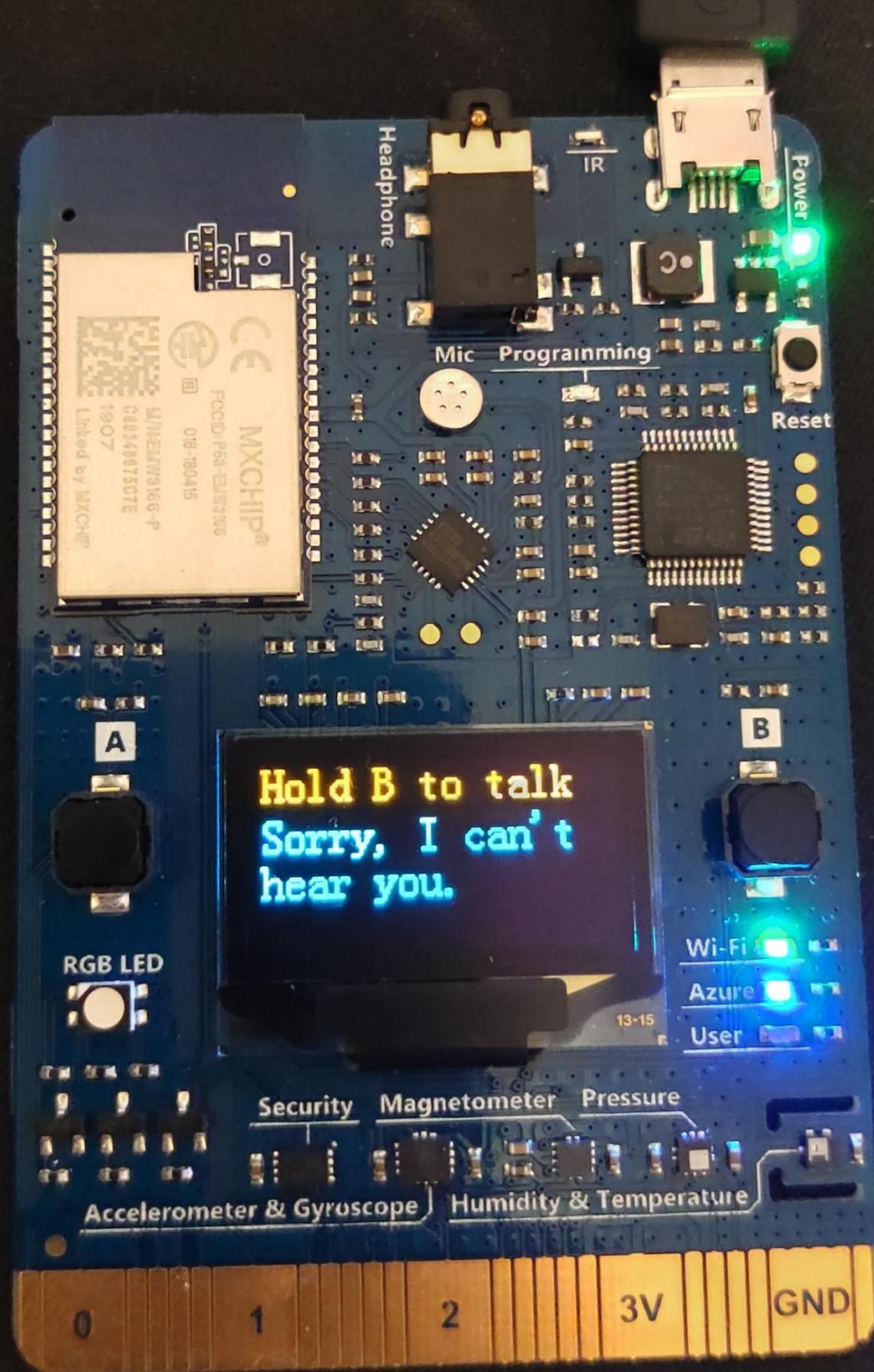
05

demo

3.

first
problem

06



07

18:03:11 | **Exception** | FunctionInvocationException @9eb53f0c45eca9e...44451169880b431
Exception while executing function: devkit...found.

18:03:11 | **Exception** | FunctionInvocationException @9eb53f0c45eca9e...44451169880b431

Time	18:03:11
Exception type	Microsoft.Azure.WebJobs.Host.FunctionInvocationException
Exception message	Exception while executing function: devkit_translator <--- Unable to load DLL 'Microsoft.CognitiveServices.Speech.core.dll' or one of its dependencies: The specified module could not be found. (Exception from HRESULT: 0x8007007E)
prop__Succeeded	False
prop__Duration	00:00:01.0690418
Category	Host.Results

```
Microsoft.Azure.WebJobs.Host.FunctionInvocationException: Exception while executing  
at Microsoft.CognitiveServices.Speech.Internal.SpeechTranslationConfig.speech_tr  
at Microsoft.CognitiveServices.Speech.SpeechTranslationConfig.FromSubscription(S
```

where is dll?

we can use REST

08

```
private static async Task<string> ProcessSpeech(Stream audioFile, string name, string urlFull, string
{
    var apiResult = string.Empty;

    using (var client = new HttpClient())
    {
        client.DefaultRequestHeaders.Accept.Add(new MediaTypeWithQualityHeaderValue("application/json"));
        client.DefaultRequestHeaders.Add(name: "Ocp-Apim-Subscription-Key", value: subscriptionKey);

        using (var content = new MultipartFormDataContent())
        {
            var streamContent = new StreamContent(audioFile);
            streamContent.Headers.Add(name: "Content-Disposition", value: $"form-data; name=\"file\"; filename=\"{name}\"");
            content.Add(streamContent, name: "file", fileName: name);
            var httpResponse = await client.PostAsync(urlFull, content);

            apiResult = await httpResponse.Content.ReadAsStringAsync();

            Trace.TraceInformation(message: $"Result - {apiResult}");
        }
    }

    return apiResult;
}
```

A close-up photograph of a motorcycle headlight. The headlight has a textured, honeycomb-like pattern. In the center, there is a small, dark, hexagonal label with the text "TURN TO CLEAR VISION" in white. The background is a blurred sunset with a bright sun low on the horizon, casting a warm glow. The entire image is framed by a blue border.

custom vision

custom vision

A customizable web service that learns to recognize specific content in imagery

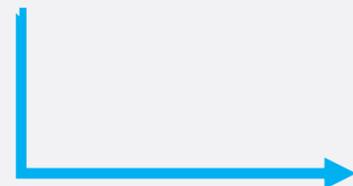
Upload images

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



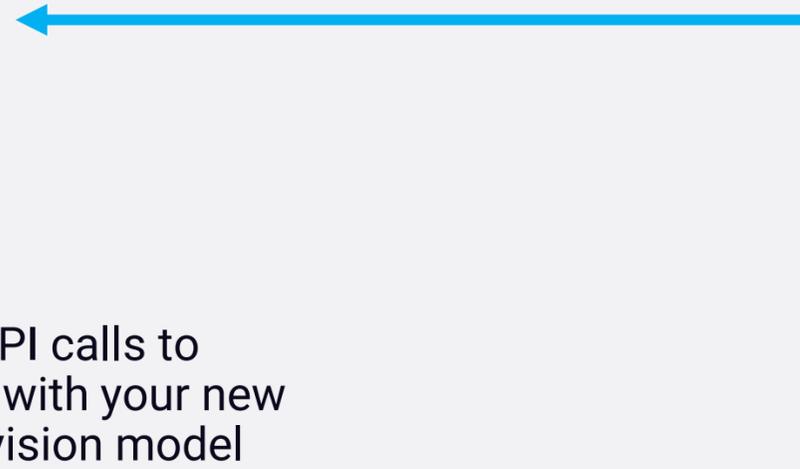
Evaluate

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



demo

4.



the future

Are you ready to enhance your products?



summary.

We talked about the AI revolution in our life.

We went through the most important cognitive services.

You had a chance to see how easy you can integrate these services with your products.

do you have any
questions?



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[@JankowskiMichal](https://twitter.com/JankowskiMichal)



github.com/MichalJankowskii



more information



- <https://azure.microsoft.com/en-us/services/cognitive-services/>
- https://info.microsoft.com/UK-DIGTRNS-CNTNT-FY19-10Oct-26-MaximisingtheAIOpportunity-AID-731692-MGC0003240_01Registration-ForminBody.html
- http://customers.microsoft.com/en-us/search?sq=%22Azure%20Cognitive%20Services%20%28AI%29%22&ff=&p=0&so=story_publish_date%20desc
- <https://github.com/Azure-Samples>

thank
you



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[@JankowskiMichal](https://twitter.com/JankowskiMichal)



github.com/MichalJankowskii

