

Microsoft Cognitive Services

Applied AI: Real-World Use Cases for Azure Cognitive Services



Paige Bailey

Sr. Cloud Developer Advocate

Work Experience

- Focus at Microsoft is *machine learning* and *artificial intelligence*.
- Prior to joining Microsoft, was a *data scientist* and *geophysical application developer* in the energy industry for 5 years.
- *GIS Technician* (Esri products) for two years.

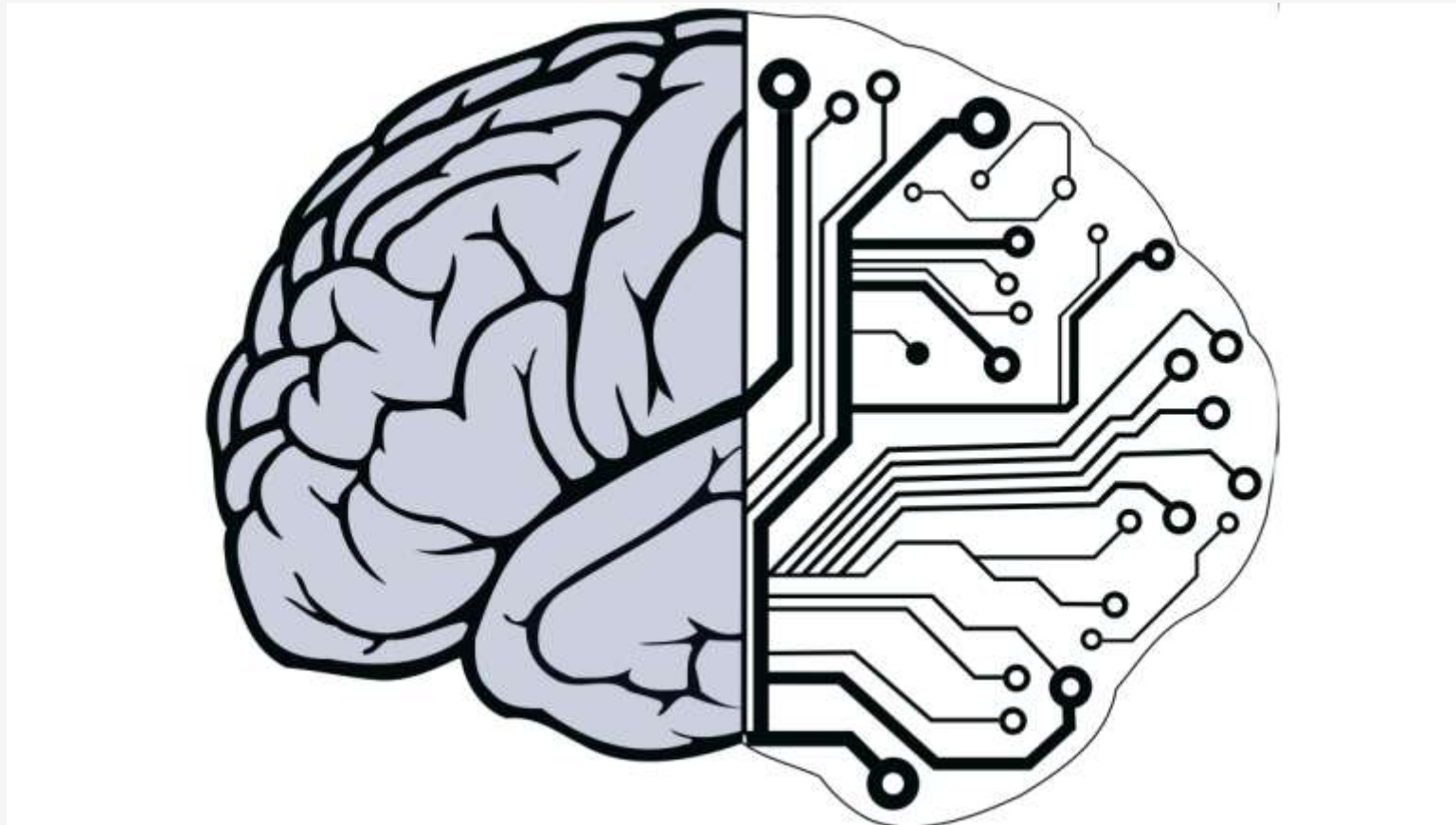
Toolkit

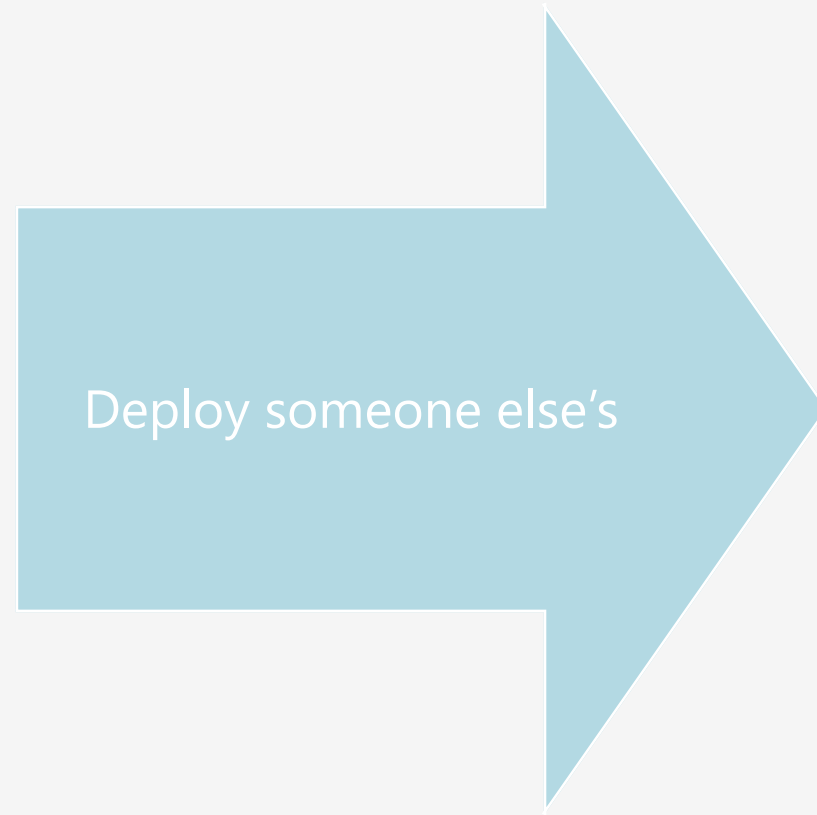
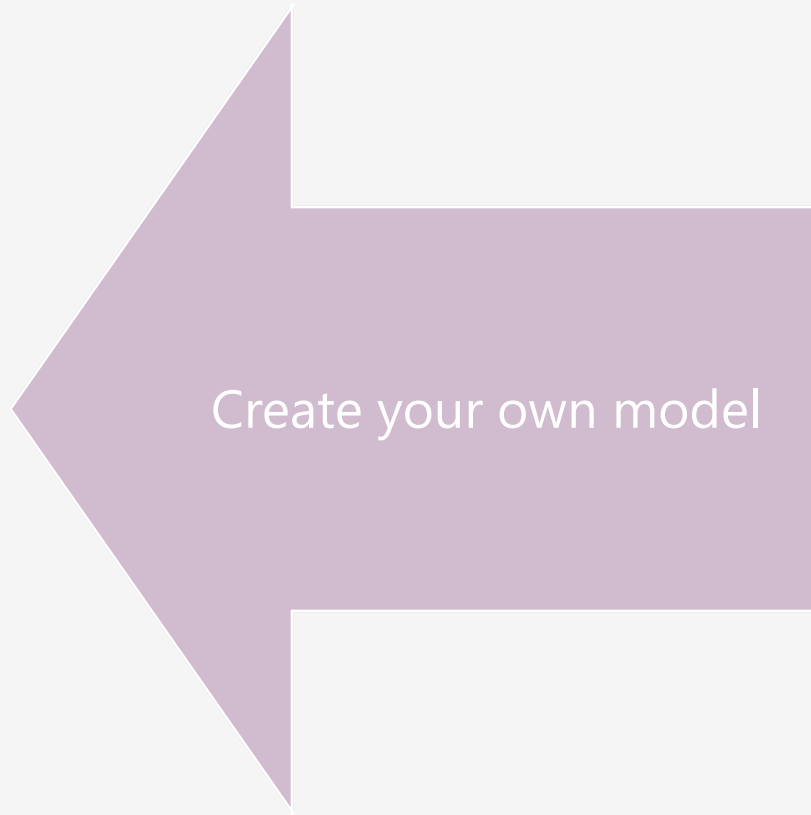
- Python (*10 years*)
- R (*4 years*)
- Spark, Kafka, Hive, HBase (*2 years*)

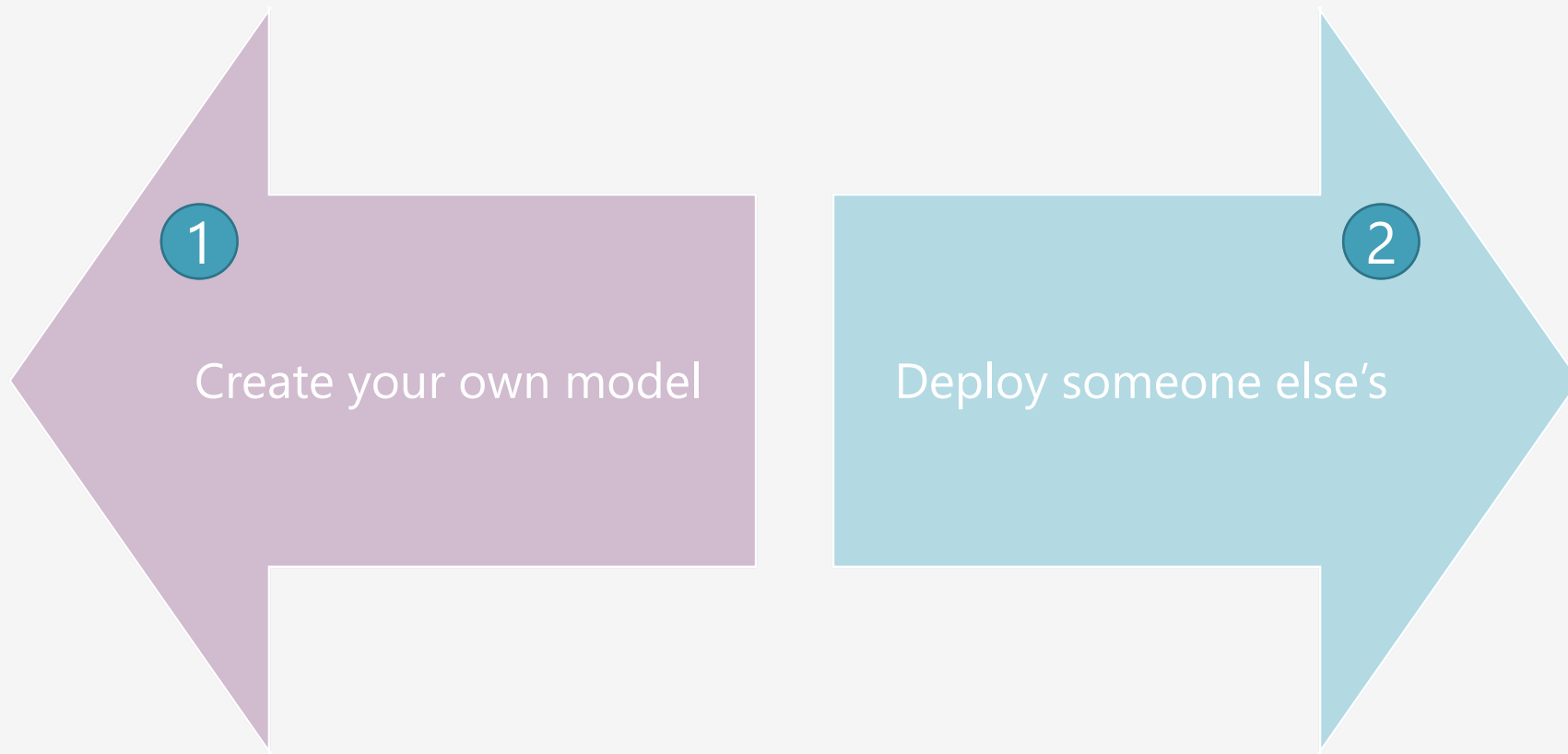
Location: *Austin, TX*

Twitter: [@DynamicWebPaige](https://twitter.com/DynamicWebPaige)









Creating Your Own Model

JABIL



JABIL

Real-time monitoring dashboard

AOI Operator

Manufacturing Area: Bay 05.2
Production Order: 2017-08-01-001234

Predictive

2 pass

1 fail

66.67% yield

Operator

0 pass

0 fail

3 to be retested

NA yield

COMMITMENT FAIL

Manufacturing Area: Bay 05.2
Serial Number: 22814776

FAIL

1 of 2062 total components

TOP 5 FAILURES

Manufacturing Area: Bay 05.2
Production Order: 2017-08-01-001234

Top

Inspection Category

Total

1 Defect

20

2 Defect

20

3 Defect

20

4 Defect

20

5 Defect

20

SUSPECTED FAULTY COMPONENTS

Manufacturing Area: Bay 05.2
Serial Number: 22814776

Component: 0001
Model Score: 92.19%
Defect: Capacitor

Predictive: Operator

Predicted Fail

Component: 0002
Model Score: 70.41%
Defect: Polarity

Predictive: Operator

Predicted Pass

Component: 0003
Model Score: 71.34%
Defect: Bad pass

Predictive: Operator

Predicted Pass

Component: 0004
Model Score: 70.15%
Defect: Polarity

Predictive: Operator

Predicted Pass

Component: 0005
Model Score: 84.11%
Defect: Soldered

Predictive: Operator

Predicted Pass

Component: 0006
Model Score: 82.03%
Defect: Orientation

Predictive: Operator

Predicted Pass

Component: 0007
Model Score: 82.03%
Defect: Orientation

Predictive: Operator

Predicted Pass

Component: 0008
Model Score: 82.03%
Defect: Orientation

Predictive: Operator

Predicted Pass

Component: 0009
Model Score: 82.03%
Defect: Orientation

Predictive: Operator

Predicted Pass

Component: 0010
Model Score: 82.03%
Defect: Orientation

Predictive: Operator

Predicted Pass

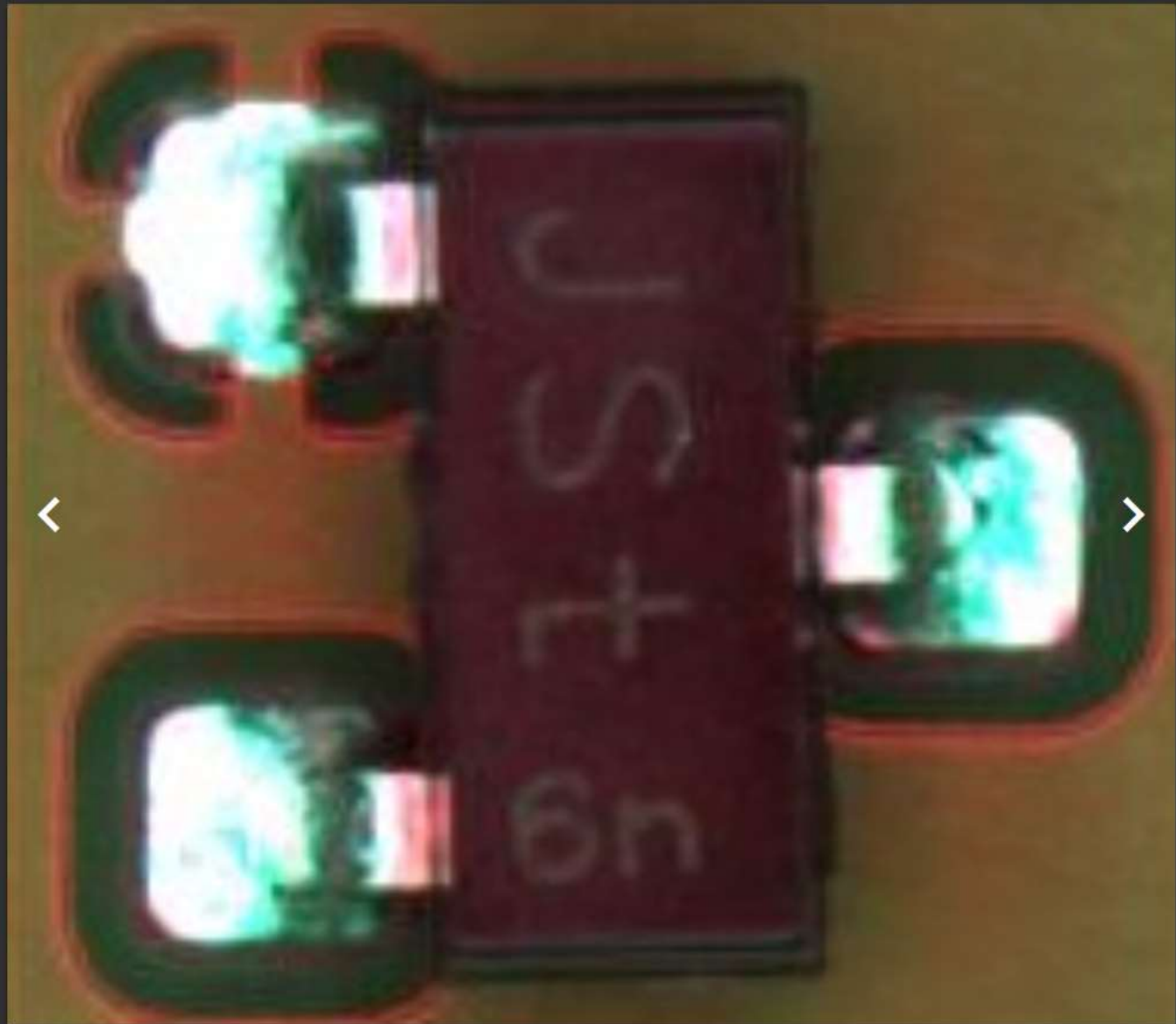
RKZ123610-1-2017-02-22

RKZ323220-1-2017-02-22

RYN901641-2-2017-04-01

RKZ123210-1-2017-05-10

Optical Image Analysis



RKZ123610-1-2017-02-22



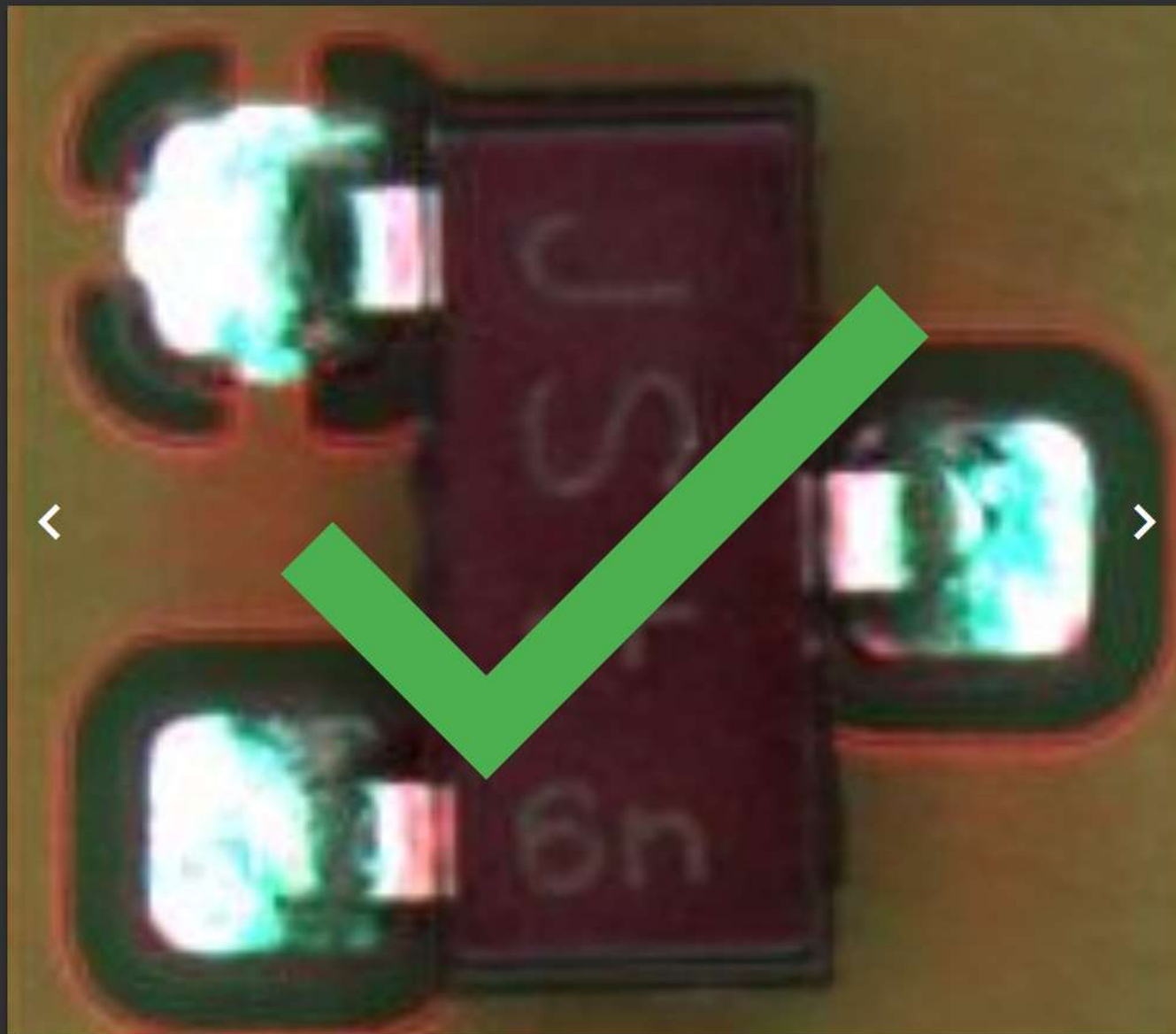
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RYN901641-2-2017-04-01

RKZ123210-1-2017-05-10



Optical Image Analysis



RKZ123610-1-2017-02-22



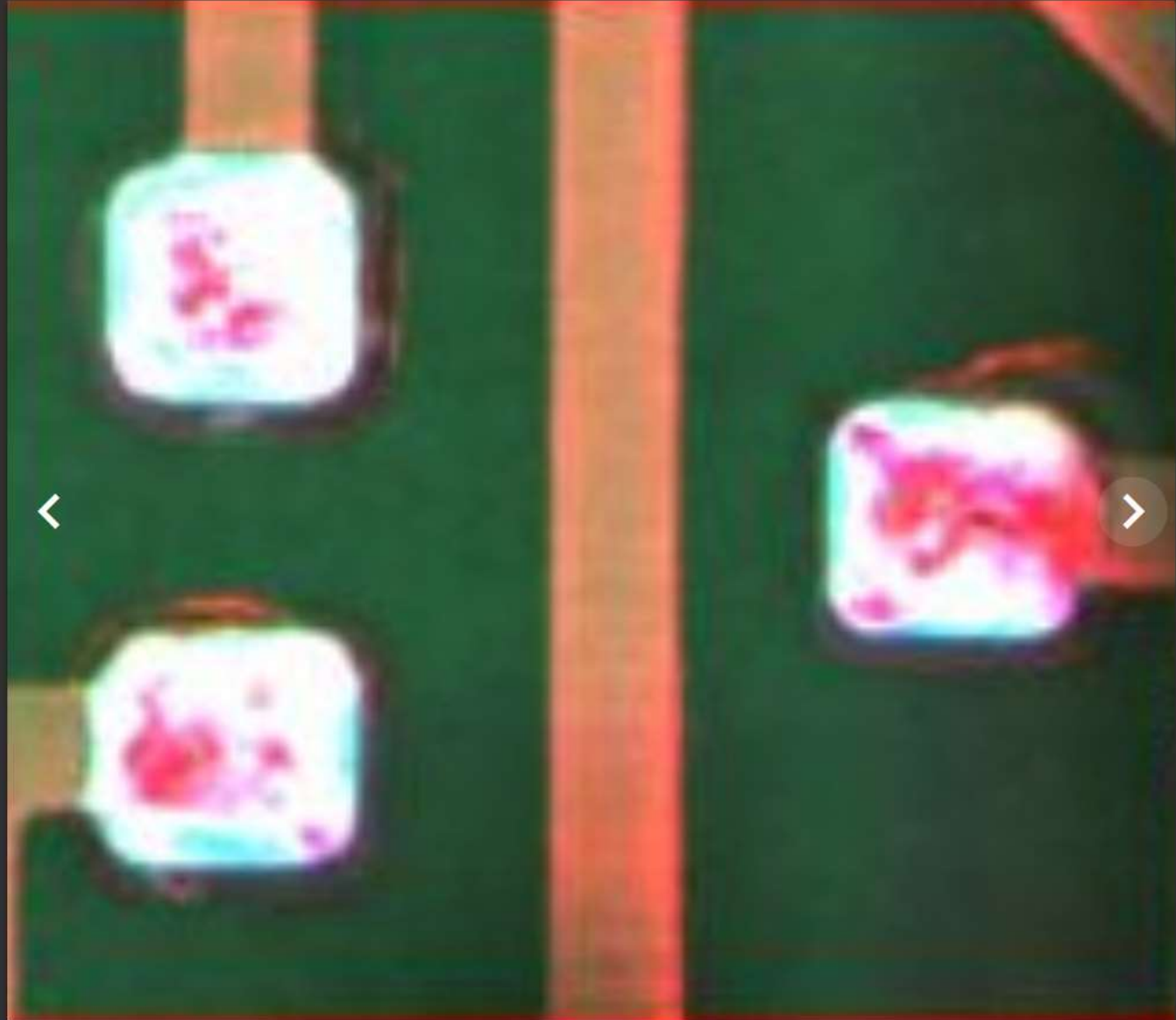
RKZ323220-1-2017-02-22

RYN901641-2-2017-04-01

RKZ123210-1-2017-05-10



Optical Image Analysis



RKZ123610-1-2017-02-22 ✓

RKZ323220-1-2017-02-22 ✗

RYN901641-2-2017-04-01

RKZ123210-1-2017-05-10

Optical Image Analysis



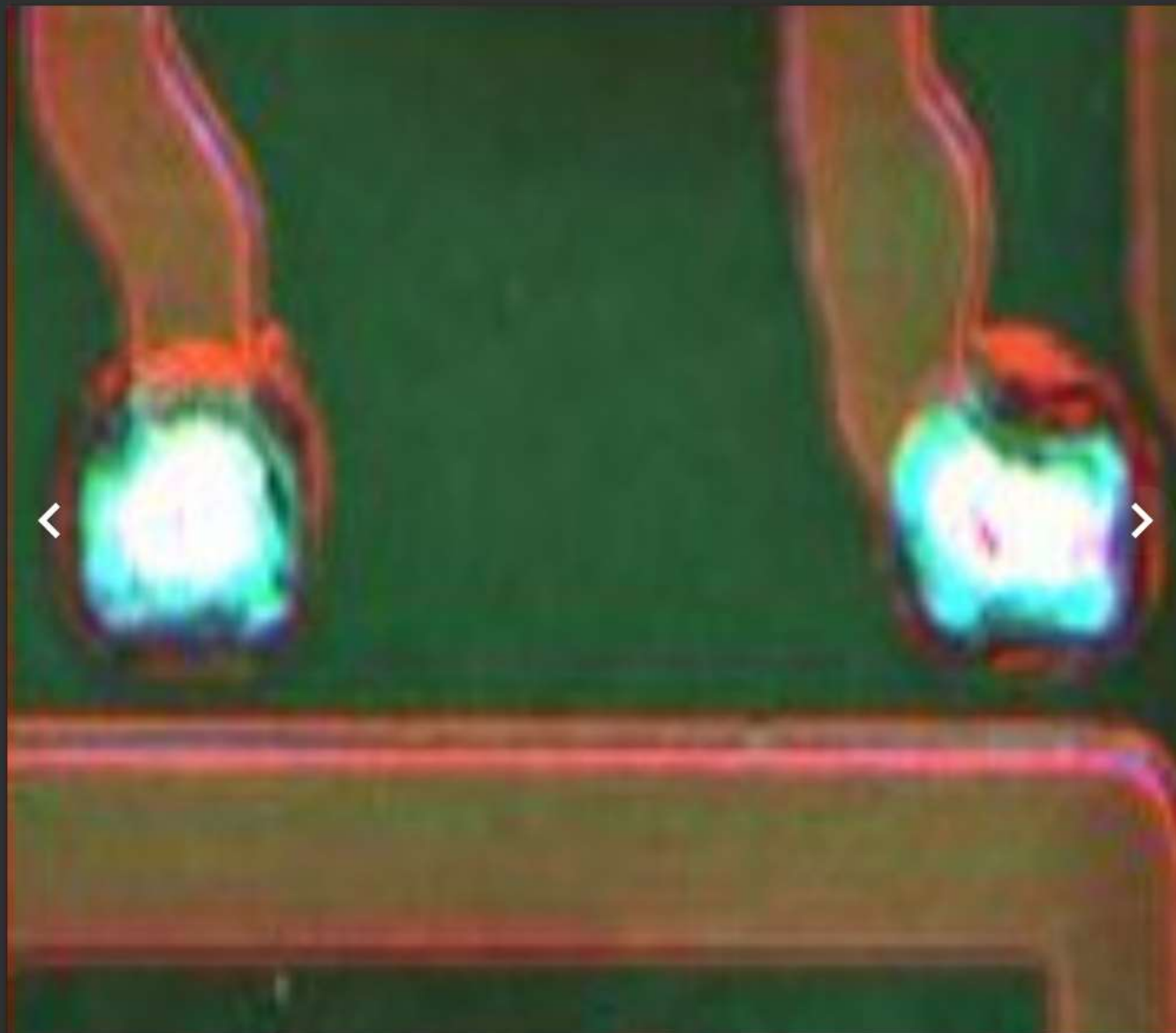
RKZ123610-1-2017-02-22 ✓

RKZ323220-1-2017-02-22 ✗

RYN901641-2-2017-04-01 ✓

RKZ123210-1-2017-05-10

Optical Image Analysis



RKZ123610-1-2017-02-22 ✓

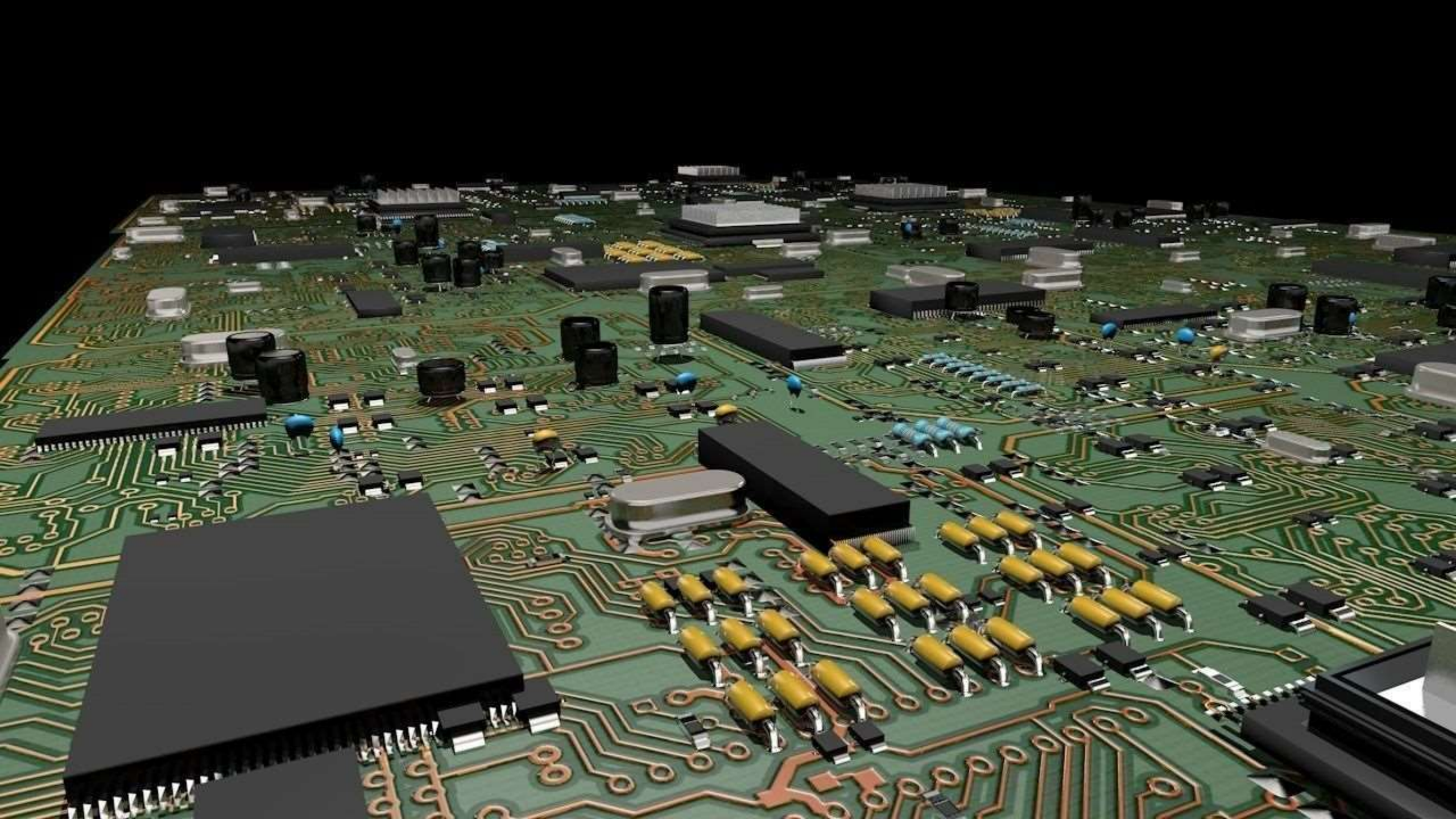
RKZ323220-1-2017-02-22 ✗

RYN901641-2-2017-04-01 ✓

RKZ123210-1-2017-05-10 ✗

Optical Image Analysis





Creating a Machine Learning Model

Data Science Virtual Machines

Azure Machine Learning Workbench

Azure Notebooks

Azure Machine Learning Case Study:

Jabil Circuitboards

Creating a Machine Learning Model

Data Science Virtual Machines

Azure Machine Learning Workbench

Azure Notebooks



Data Science Virtual Machines

[https://aka.ms/](https://aka.ms/DSVMs)
DSVMs

Experience Level: *Intermediate* -- // -- *Developers, Data Analysts*

Data Science Virtual Machines

<https://aka.ms/>

AMLWorkbench

Experience Level: *Intermediate* -- // -- *Developers, Data Analysts*

Azure Notebooks

<https://aka.ms/>

AzureNotebooks

Experience Level: *Advanced* -- // -- *Data Scientists, Data Analysts*

Deploying Someone Else's

Deploying Machine Learning Models on Azure

Microsoft Excel

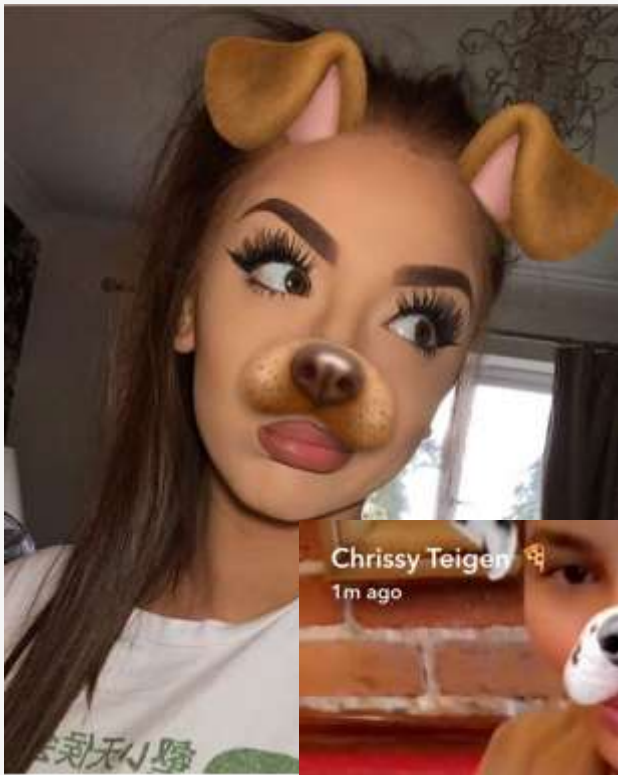
Azure Machine Learning Studio

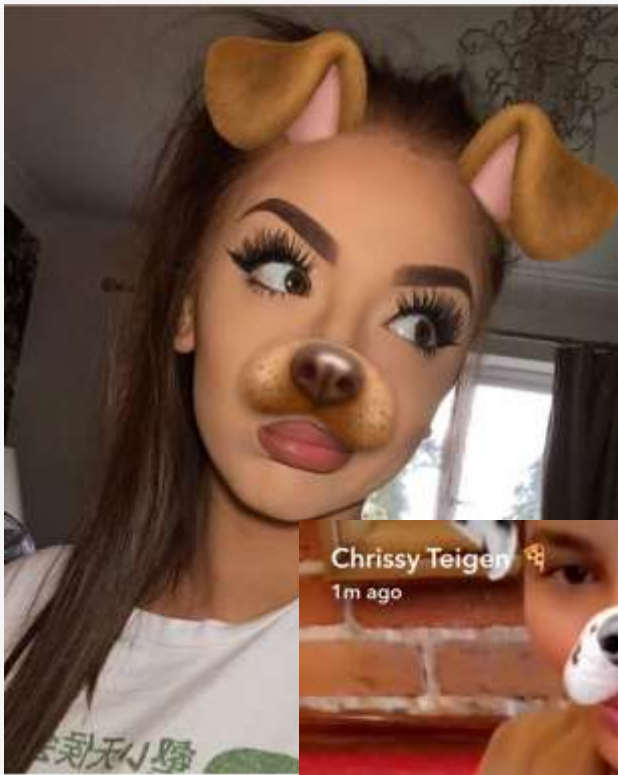
Cognitive Services











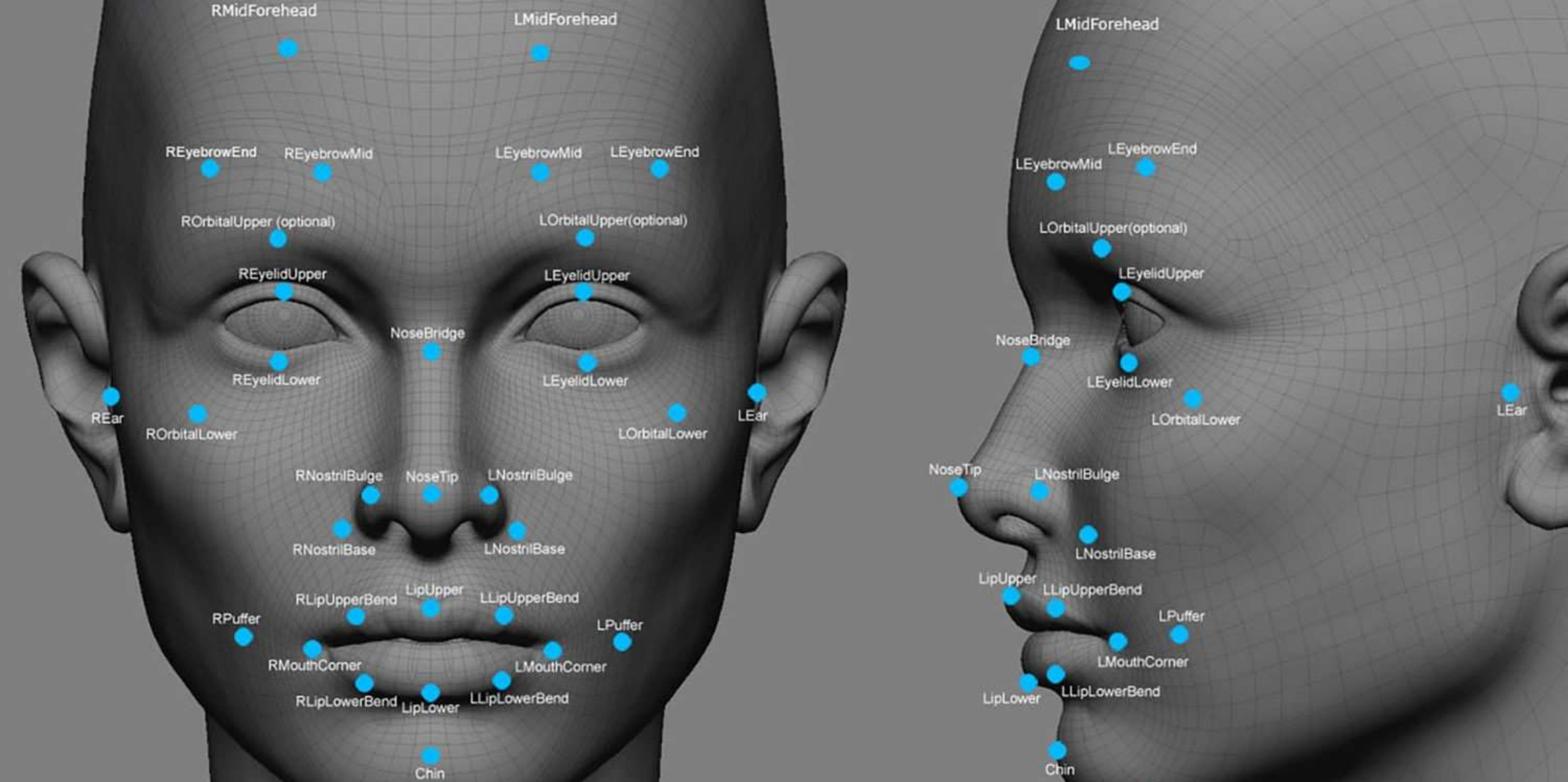
Chrissy Teigen
1m ago











Cognitive Services Case Study:

Face API

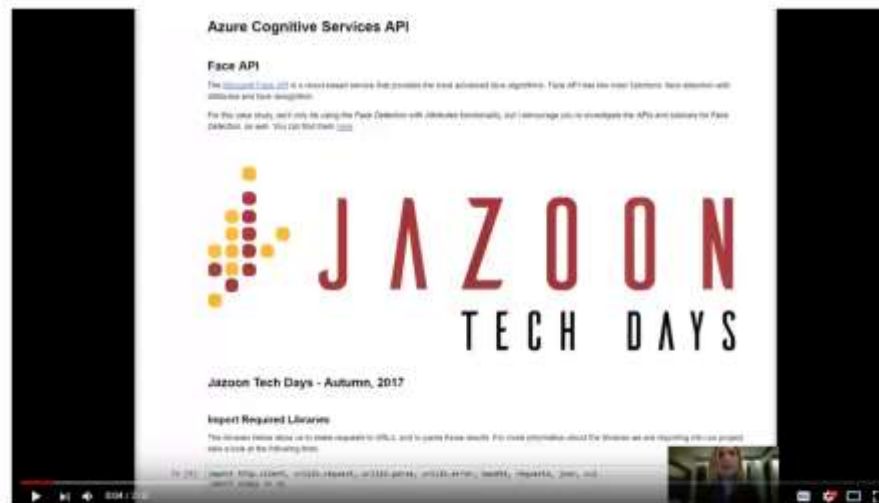


Computer Vision API

Distill actionable information from images



Microsoft Translator Text API



Day 2: Face API - Emotions
25 mins



Emotion API PREVIEW

Personalize user experiences with emotion recognition



Language Understanding Intelligent Service PREVIEW

Teach your apps to understand commands from your users



Paige Bailey

@DynamicWebPaige

Meet D4N, the ever-charming artificial intelligence FAQ chat bot I'm building for @DayForNightFest. dayfornight.io @Azure

Chat



Hi! I'm D4N (Day for Night 2017 FAQ Bot). Say "hi" if you'd like to chat.

D4N (Day for Night 2017 FAQ Bot) · Now

hi

You · Now



Hello

D4N (Day for Night 2017 FAQ Bot) · Now

[Download chat logs](#) | [Upload chat logs](#)

Type your message...



```

import http.client, urllib.request, urllib.parse, urllib.error, base64, json

# Replace the subscription_key string value with your valid subscription key.
subscription_key = secret

# Replace to match your region.

uri_base = 'westcentralus.api.cognitive.microsoft.com'

headers = {
    # Request headers.
    'Content-Type': 'application/json',
    'Ocp-Apim-Subscription-Key': subscription_key,
}

params = urllib.parse.urlencode({
    # Request parameters. All of them are optional.
    'visualFeatures': 'Categories,Description,Color',
    'language': 'en',
})

body = '{"url":"http://paigevie.ws/zurich_rolls.JPG"}'

try:
    # Execute the REST API call and get the response.
    conn = http.client.HTTPSConnection('westcentralus.api.cognitive.microsoft.com')
    conn.request("POST", "/vision/v1.0/analyze?%s" % params, body, headers)
    response = conn.getresponse()
    data = response.read()

    # 'data' contains the JSON data. The following formats the JSON data for display.
    parsed = json.loads(data.decode())
    print ("Response:")
    print (json.dumps(parsed, sort_keys=True, indent=2))
    conn.close()

except Exception as e:
    print ('Error:')
    print (e)

```

```

import requests

# Get the key from tab Keys on Azure portal
key = "INSERT YOUR KEY HERE"

url4authentication = 'https://api.cognitive.microsoft.com/sts/v1.0/issueToken'
headers4authentication = {'Ocp-Apim-Subscription-Key': key}
resp4authentication = requests.post(url4authentication, headers=headers4authentication)
token = resp4authentication.text

# Call the Text Translate API
text = ""

This woman needs steak, immediately.
Can you please assist?

"""
come = "en"
to = "sk"

url4translate = 'https://api.microsofttranslator.com/v2/http.svc/Translate'
params = {'appid': 'Bearer '+token, 'text': text, 'from': come, 'to': to}
headers4translate = {'Accept': 'application/xml'}
resp4translate = requests.get(url4translate, params=params, headers=headers4translate)
print(resp4translate.text)

```

Code and Examples available at:

@DynamicWebPaige



Suz 🐧 vim witch ❄️
@noopkat

Following

Using some silly code I wrote to stress test the face api + hotel wifi. Surprisingly responsive!



Asim Hussain
@jawache

Following

Just released my first web component! smiletounlock.com built using [@stenciljs](#).
Want to give away free content on your site?
How about asking for a smile in return 😊



Computer Vision API

Distill actionable information from images



Content Moderator

Automated image, text, and video moderation



Video API PREVIEW

Intelligent video processing



Video Indexer PREVIEW

Unlock video insights



Face API

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



Emotion API PREVIEW

Personalize user experiences with emotion recognition



Custom Vision Service PREVIEW

Easily customize your own state-of-the-art computer vision models for your unique use case

Vision

Speech

Language

Knowledge

Search

Labs



Translator Speech API

Easily conduct real-time speech translation with a simple REST API call



Speaker Recognition API PREVIEW

Use speech to identify and authenticate individual speakers



Bing Speech API

Convert speech to text and back again to understand user intent



Custom Speech Service PREVIEW

Overcome speech recognition barriers like speaking style, background

Vision

Speech

Language

Knowledge

Search

Labs



Language Understanding Intelligent Service PREVIEW

Teach your apps to understand commands from your users



Text Analytics API

Easily evaluate sentiment and topics to understand what users want



Bing Spell Check API

Detect and correct spelling mistakes in your app



Translator Text API

Easily conduct machine translation with a simple REST API call



Web Language Model API PREVIEW

Use the power of predictive language models trained on web-scale data



Linguistic Analysis API PREVIEW

Simplify complex language concepts and parse text with the Linguistic Analysis API



Recommendations API PREVIEW

Predict and recommend items your customers want



Academic Knowledge API PREVIEW

Tap into the wealth of academic content in the Microsoft Academic Graph



Knowledge Exploration Service PREVIEW

Enable interactive search experiences over structured data via natural language inputs



QnA Maker API PREVIEW

Distill information into conversational, easy-to-navigate answers



Entity Linking Intelligence Service API PREVIEW

Power your app's data links with named entity recognition and disambiguation



Custom Decision Service PREVIEW

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



Bing Autosuggest API

Give your app intelligent autosuggest options for searches



Bing News Search API

Search for news and get comprehensive results



Bing Web Search API

Get enhanced search details from billions of web documents



Bing Entity Search API PREVIEW

Enrich your experiences by identifying and augmenting entity information from the web



Bing Image Search API

Search for images and get comprehensive results



Bing Video Search API

Search for videos and get comprehensive results



Bing Custom Search API

An easy-to-use, ad-free, commercial-grade search tool that lets you deliver the results you want

Vision

Speech

Language

Knowledge

Search

Labs



Project Prague

Gesture based controls



Project Nanjing

Isochrones calculations



Project Johannesburg

Route logistics



Project Cuzco

Event associated with Wikipedia entries



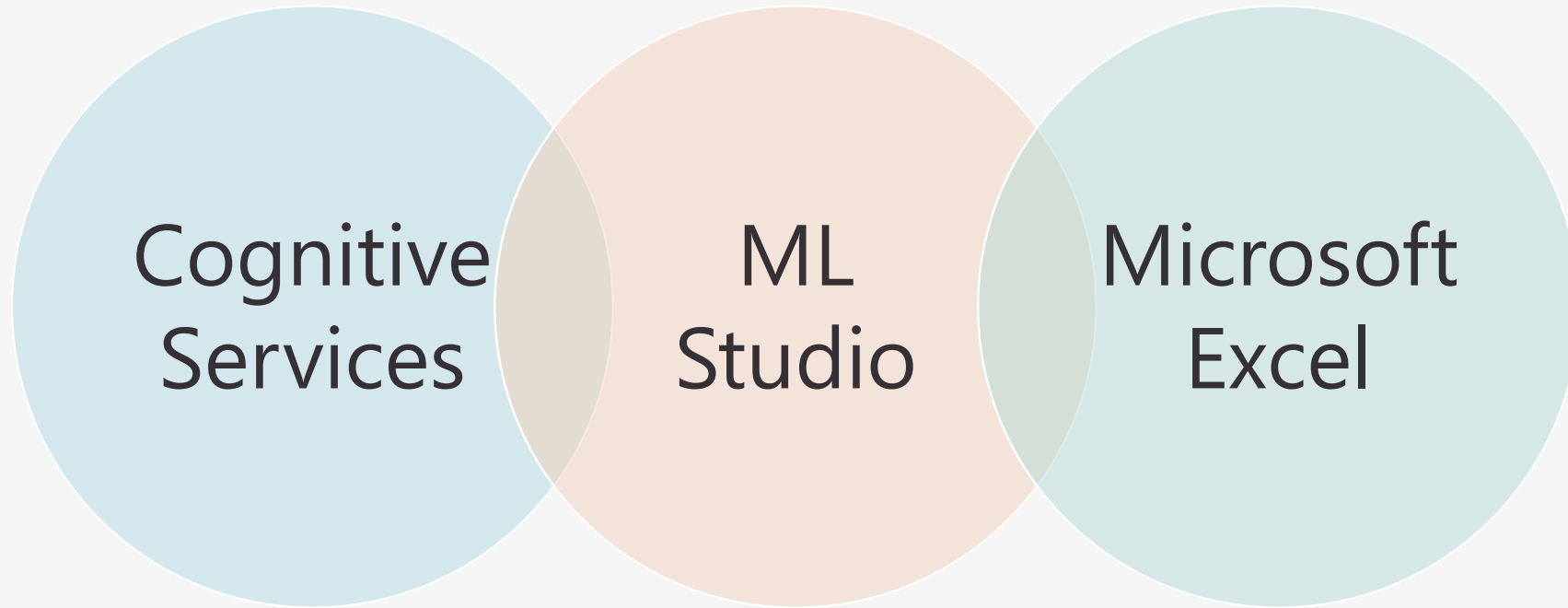
Project Abu Dhabi

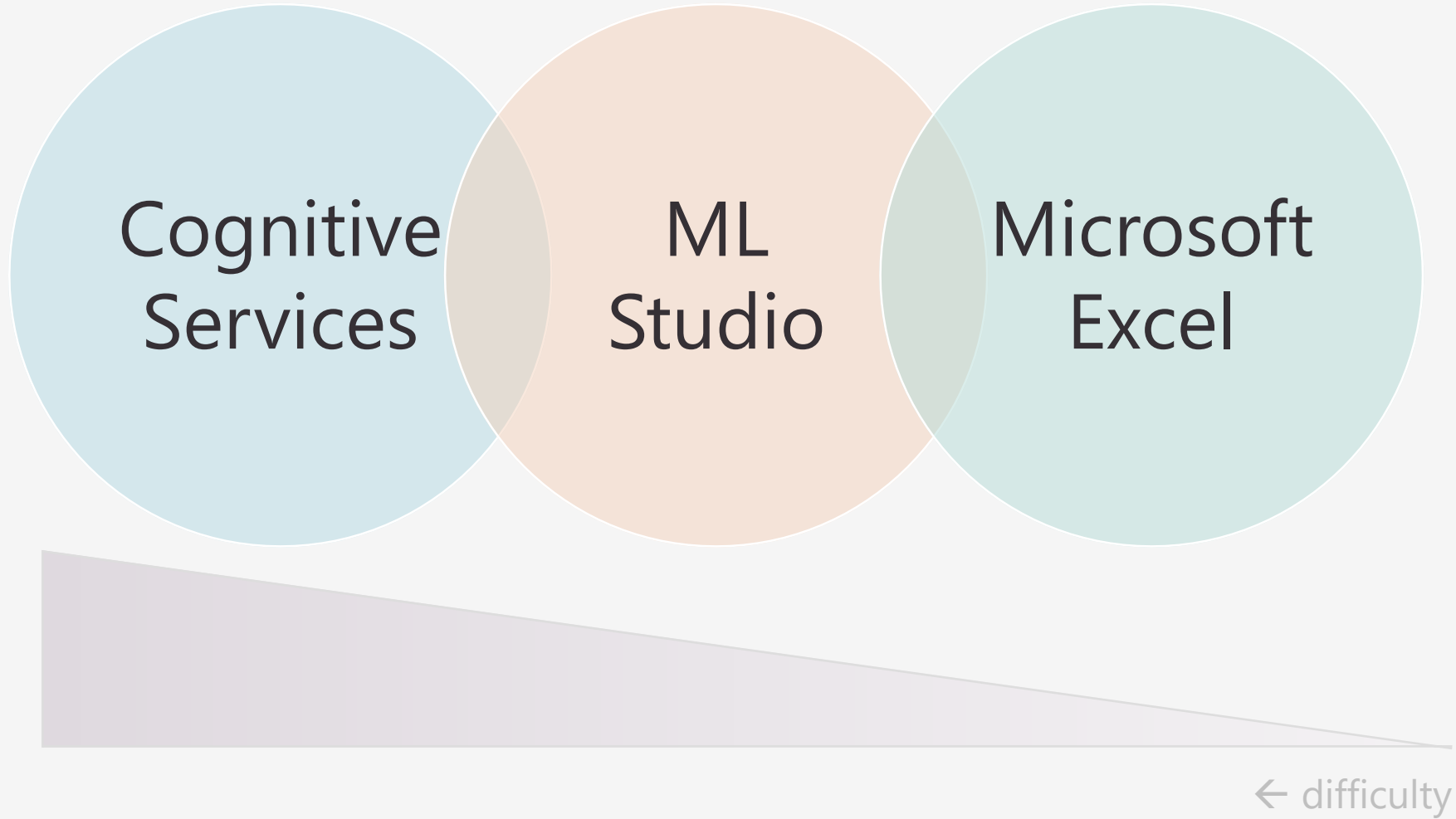
Distance matrix



Project Wollongong

Location insights





Azure Notebooks

<https://aka.ms/>

CognitiveServices

Experience Level: *Intermediate* -- // -- *Developers, Data Analysts*

Azure ML Studio

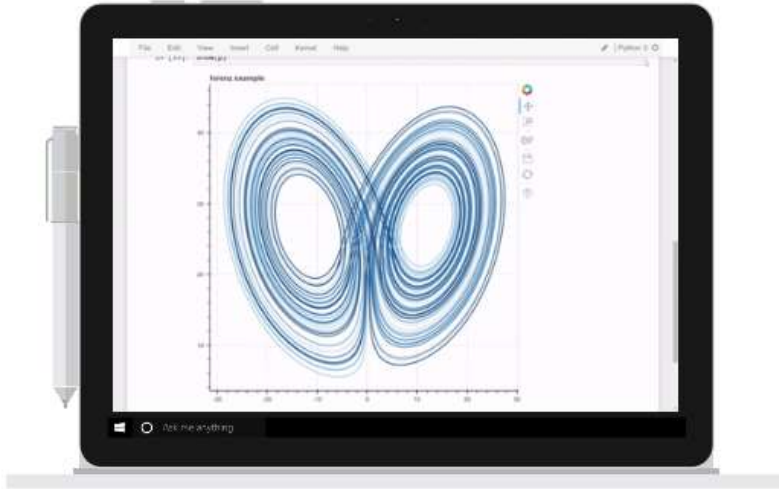
<https://aka.ms/>

AzureMLStudio

Microsoft Excel

[https://aka.ms/](https://aka.ms/ExcelML)
ExcelML

Experience Level: *Beginner* -- // -- *Business Intelligence Analysts, ML Enthusiasts*



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For Data Science
and Analysis



For Teaching
and Learning



For Research
and Development

Getting Started

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- [Jazoon Tech Days 2017 Library](#)
- [Jazoon Tech Days 2017 Presentation](#)

AI on Azure

- [Azure ML Studio](#)
- [Cortana Intelligence Gallery](#)
- [Data Science Virtual Machines](#)
- [Microsoft Docs](#)

Thank you!