AI on Cloud

depa Microsoft AIT Asian Institute of Technology SCB ACADEMY

AI on Cloud

Chapter 3

คอมพิวเตอร์วิทัศน์ (Computer Vision)

depa Microsoft AIT Asian Institute of Technology SCB ACADEMY

Lab

1 แนะนำ Computer Vision Services บน Azure และสร้าง Image Analysis

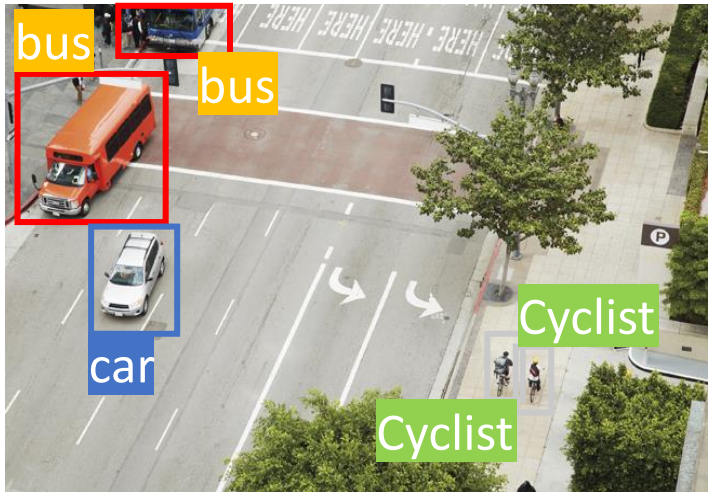
Computer vision

- *Computer vision* focuses on creating solutions that enable AI applications to "see" the world and make sense of it.
- Computers are capable of processing images; either from a live camera feed or from digital photographs or videos. This ability to process images is the key to creating software that can emulate human visual perception.

Applications of Computer Vision

Image Classification

Object Detection



Semantic Segmentation

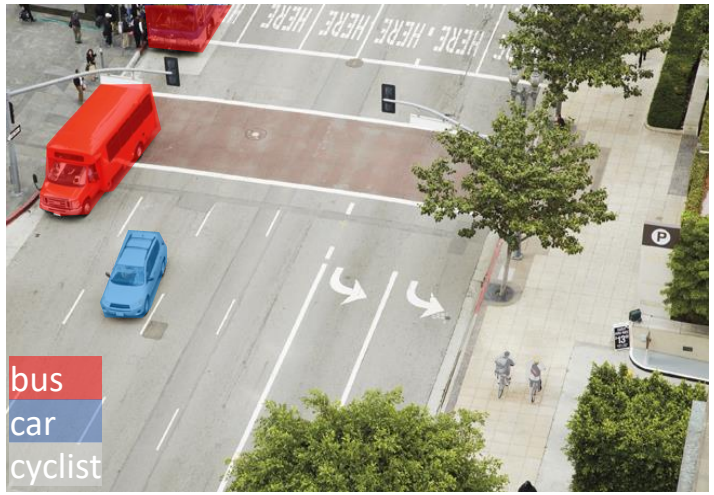


Image Analysis

Face Detection & Recognition

Optical Character Recognition

Computer Vision Services in Azure

- Training machine learning models from scratch can be very time intensive and require a large amount of data.
- Microsoft's Computer Vision service gives you access to pre-trained computer vision capabilities (pre-built computer vision).

Computer Vision	• Image analysis – automated captioning and tagging • Common object detection • Face detection • Smart cropping • Optical character recognition
Custom Vision	• Custom image classification • Custom object detection
Face	• Face detection and analysis
Form Recognizer	• Data extraction from forms, invoices, and other documents

Azure resources for Computer Vision

Resource	Description
Computer Vision	A specific resource for the Computer Vision service. Use this resource type if you don't intend to use any other cognitive services, or if you want to track utilization and costs for your Computer Vision resource separately.
Cognitive Services	A general cognitive services resource that includes Computer Vision along with many other cognitive services; such as Text Analytics, Translator Text, and others. Use this resource type if you plan to use multiple cognitive services and want to simplify administration and development.

Both type of resources provide 2 pieces of information that you will need to use it:

1. A **key** that is used to authenticate client applications.
2. An **endpoint** that provides the HTTP address at which your resource can be accessed.

Lab1: Image Analysis

เป้าหมาย:

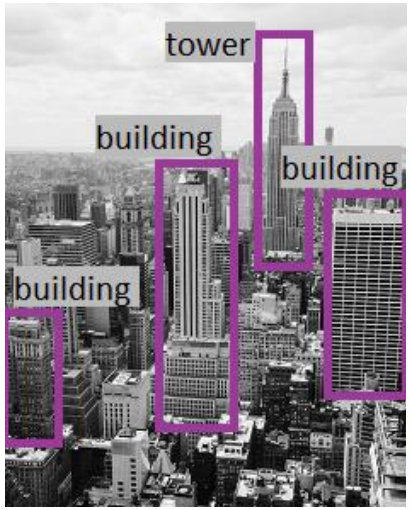
- วิเคราะห์ภาพจากกล้องภายในร้านค้า เพื่อช่วยเหลือพนักงานในการดูแลความเรียบร้อยภายในร้านและระบุหาลูกค้าที่ต้องการความช่วยเหลือ
- พัฒนา AI service โดยใช้ Computer Vision service เพื่อวิเคราะห์ข้อมูลภาพจากกล้องที่ติดตั้งในร้านค้า

Tool: *Computer Vision* **cognitive service**

This service uses pre-trained machine learning models to analyze images and extract information about them.

Image Analysis

- Analytical tasks
  - Describing an image
  - Tagging visual features
  - Detecting objects
  - Detecting brands
  - Detecting faces
  - Categorizing an image
  - Detecting domain-specific content: e.g., Celebrities, Landmarks.
  - Optical character recognition
- More tasks: https://azure.microsoft.com/en-us/services/cognitive-services/computer-vision/#overview
- Doc: https://docs.microsoft.com/en-us/azure/cognitive-services/computer-vision/

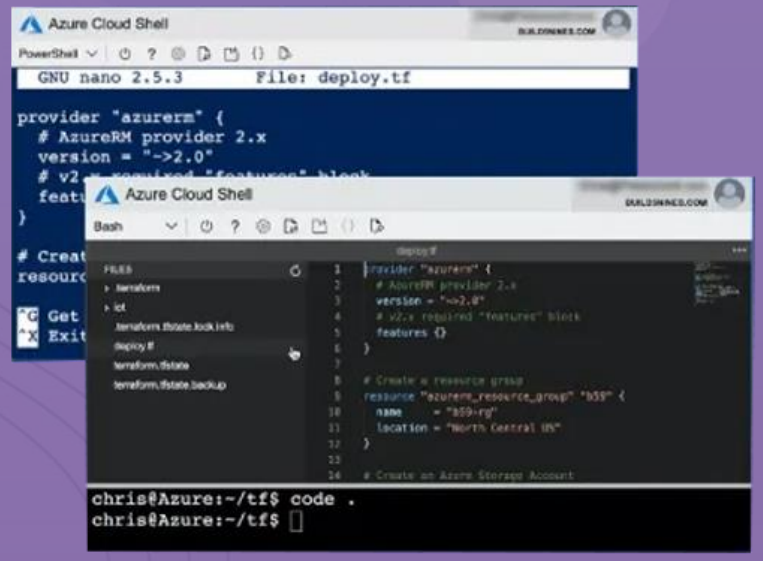


- A black and white photo of a city
- A black and white photo of a large city
- A large white building in a city

category **people group**

https://docs.microsoft.com/en-us/learn/modules/analyze-images-computer-vision/2-image-analysis-azure

Step 1. Create a *Cognitive Services* resource



Step 2. Run Cloud Shell

Step 3. Configure a client application

Step 3.1 Download the sample application and บันทึกลงใน folder ชื่อ ai-900.

```
git clone https://github.com/MicrosoftLearning/AI-900-AIFundamentals ai-900
```

Step 3.2 code ที่ใช้สำหรับ image analysis คือ **analyze-image.ps1**

กำหนดค่า $key และ $endpoint ของ service ที่สร้างขึ้น และ save ใน code

Step 3.3 Save!

Step 4. Run the client application

ใน PowerShell run คำสั่งดังนี้ เพื่อดูผลการทำงาน

```
cd ai-900
./analyze-image.ps1 store-camera-1.jpg
```

Image

Result:

```
Analyzing image...

Description:
a woman showing her phone to a child

Objects in this image:
 - cell phone
 - person
 - person
 - room

Tags relevant to this image:
 - text
 - person
 - woman
 - store
 - shop
```

- A caption that describes the image.
- A list of objects identified in the image.
- A list of "tags" that are relevant to the image.

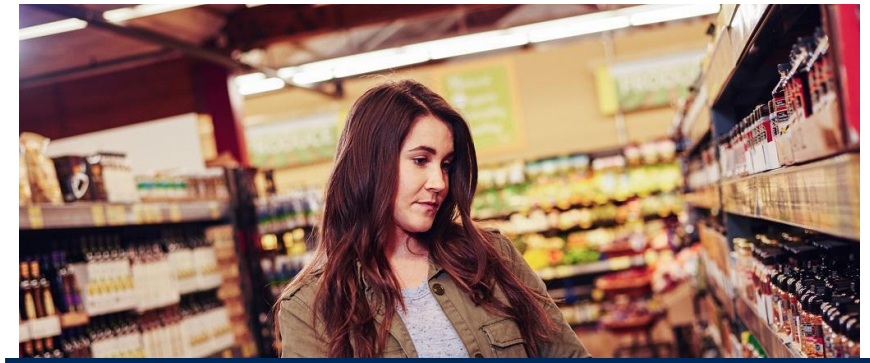
3. Configure and run a client application

```
./analyze-image.ps1 store-camera-2.jpg
```

```
./analyze-image.ps1 store-camera-3.jpg
```

3. Configure and run a client application

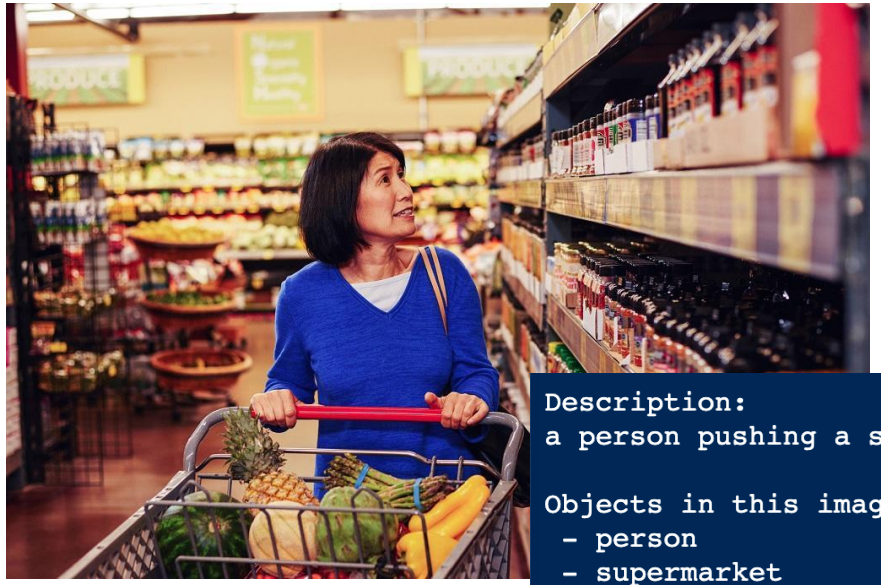
Try more images:



```
Description:
a woman holding a shopping cart in a grocery store

Objects in this image:
 - person

Tags relevant to this image:
 - text
 - person
 - woman
 - marketplace
 - shop
```



```
Description:
a person pushing a shopping cart

Objects in this image:
 - person
 - supermarket

Tags relevant to this image:
 - text
 - marketplace
 - person
 - scene
 - produce
 - shop
```


End of Lab1

Thank you