AI on Cloud

depa Microsoft AIT Asian Institute of Technology SCB ACADEMY

AI on Cloud

Chapter 3

คอมพิวเตอร์วิทัศน์ (Computer Vision)

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Lab 4:
Face Detection

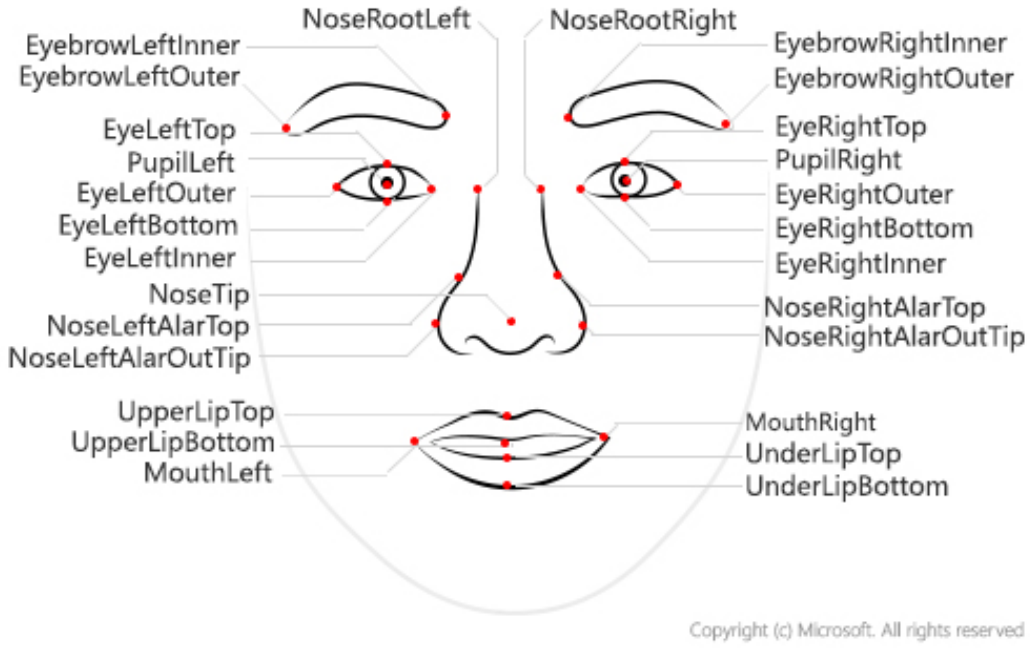
Face Detection

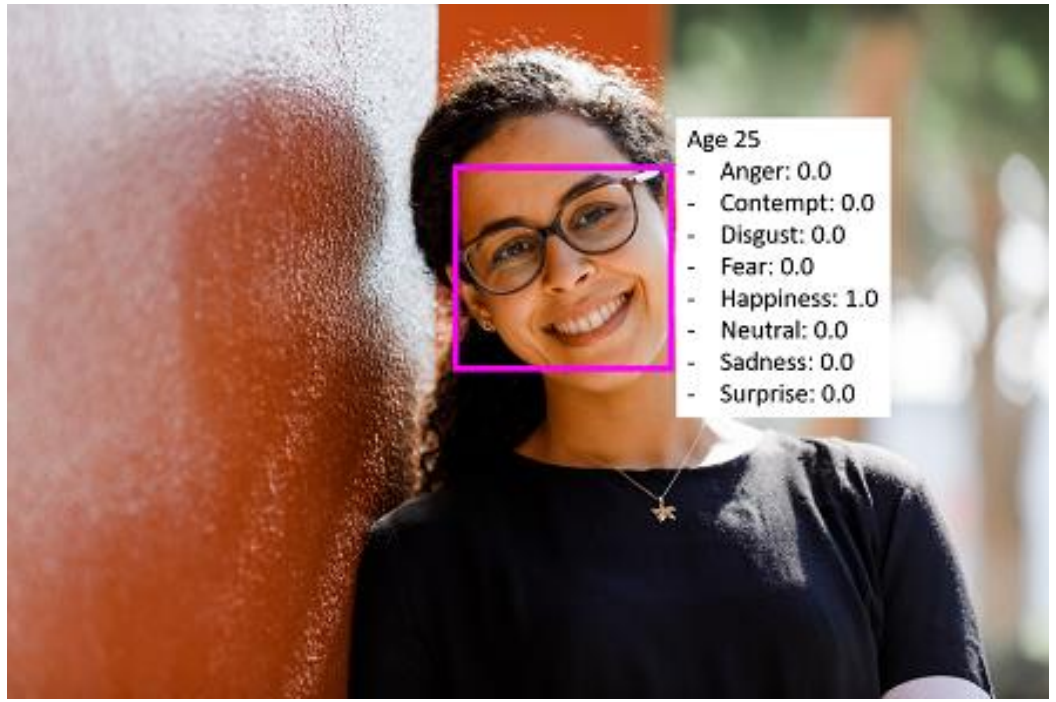
- To locate and analyze human faces in images or video content.
- Face detection involves identifying regions of an image that contain a human face, typically by returning *bounding box* coordinates that form a rectangle around the face.

https://docs.microsoft.com/en-us/learn/modules/detect-analyze-faces/1-introduction

Facial Analysis

- Some algorithms can return information e.g., facial landmarks (nose, eyes, eyebrows, lips, etc).
- Facial landmarks can be used as features to train a machine learning model that can infer information about a person e.g., age or emotional state.





https://docs.microsoft.com/en-us/learn/modules/detect-analyze-faces/1-introduction

Facial Recognition

To train a machine learning model to identify known individuals from their facial features. This usage is more generally known as *facial recognition* and involves using multiple images of each person you want to recognize to train a model so that it can detect those individuals in new images.

https://docs.microsoft.com/en-us/learn/modules/detect-analyze-faces/1-introduction

การประยุกต์ใช้ Face Detection, Analysis, and Recognition

- Security
- Social media
- Intelligent monitoring
- Advertising
- Missing persons
- Identity validation

Face Analysis uu Azure

See it in action

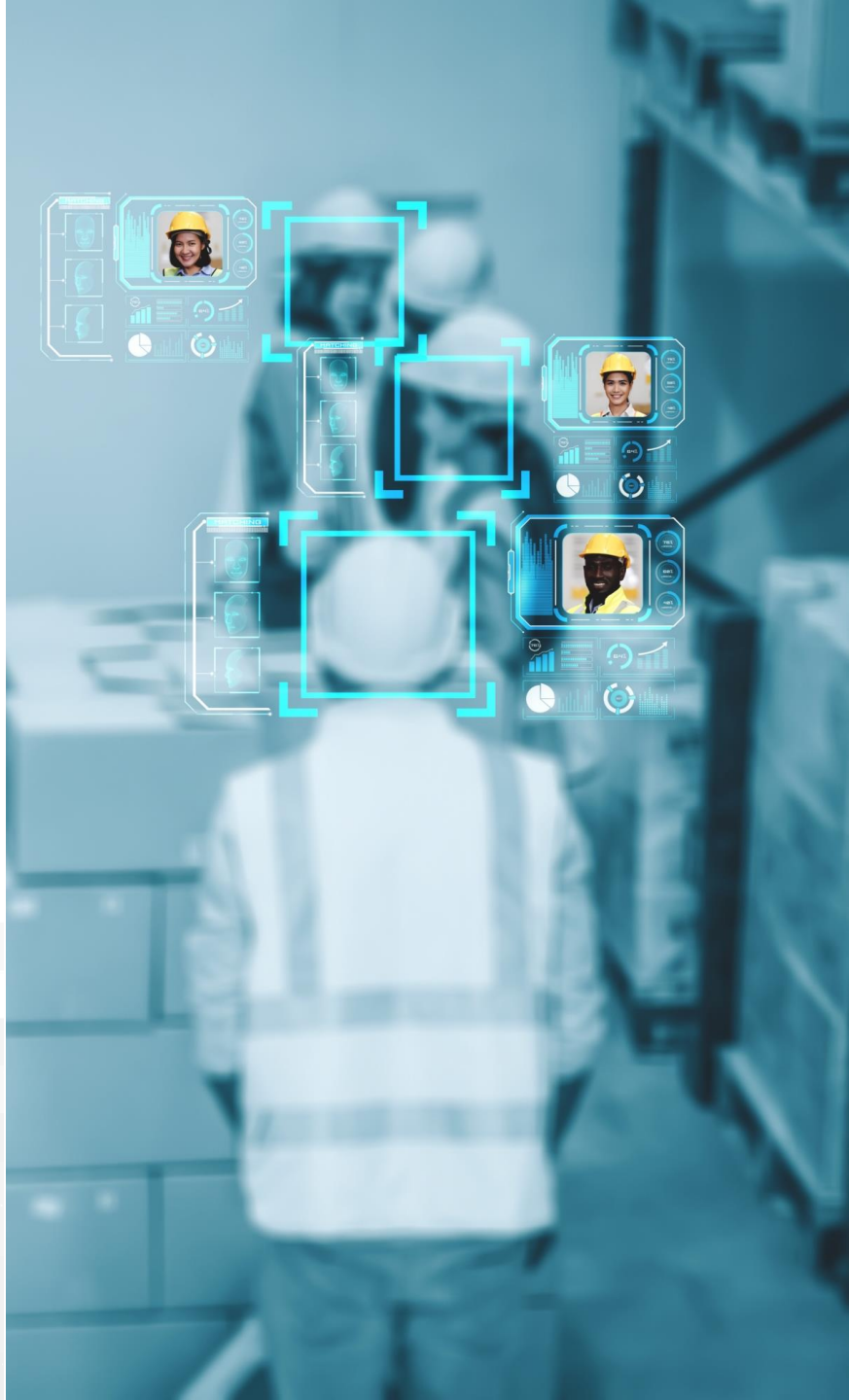

```
Detection result:
JSON:
 [
  {
    "faceId": "d4202a3d-cc61-4856-b897-6c7fe3568aa9",
    "faceRectangle": {
      "top": 128,
      "left": 459,
      "width": 224,
      "height": 224
    },
    "faceAttributes": {
      "hair": {
        "bald": 0.1,
        "invisible": false,
        "hairColor": [
          {
            "color": "brown",
            "confidence": 0.99
          },
          {
            "color": "black",
            "confidence": 0.57
          },
          {
            "color": "red",
            "confidence": 0.36
          },
```


- Computer Vision
- Video Indexer
- Face

Face

Face supports the following functionality

- Face Detection
- Face Verification
- Find Similar Faces
- Group faces based on similarities
- Identify people



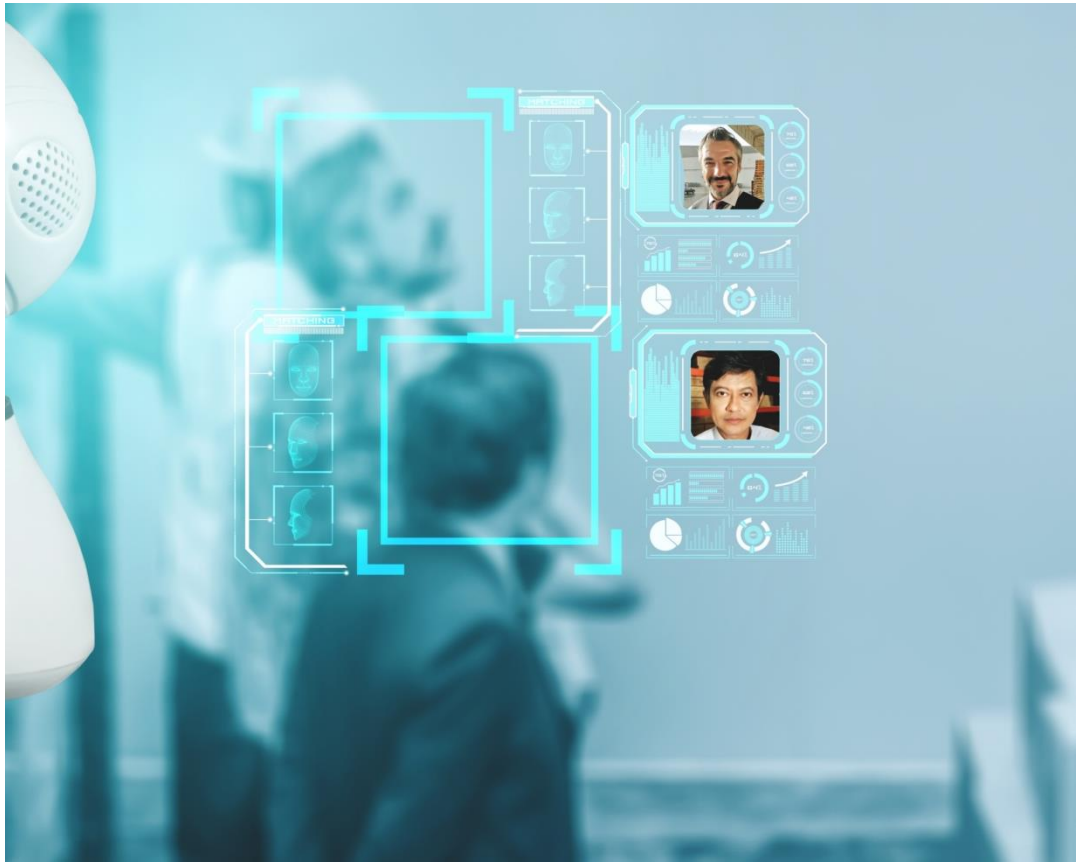
Face

Face can return the rectangle coordinates for any human faces that are found in an image, as well as a series of attributes related to those faces such as:

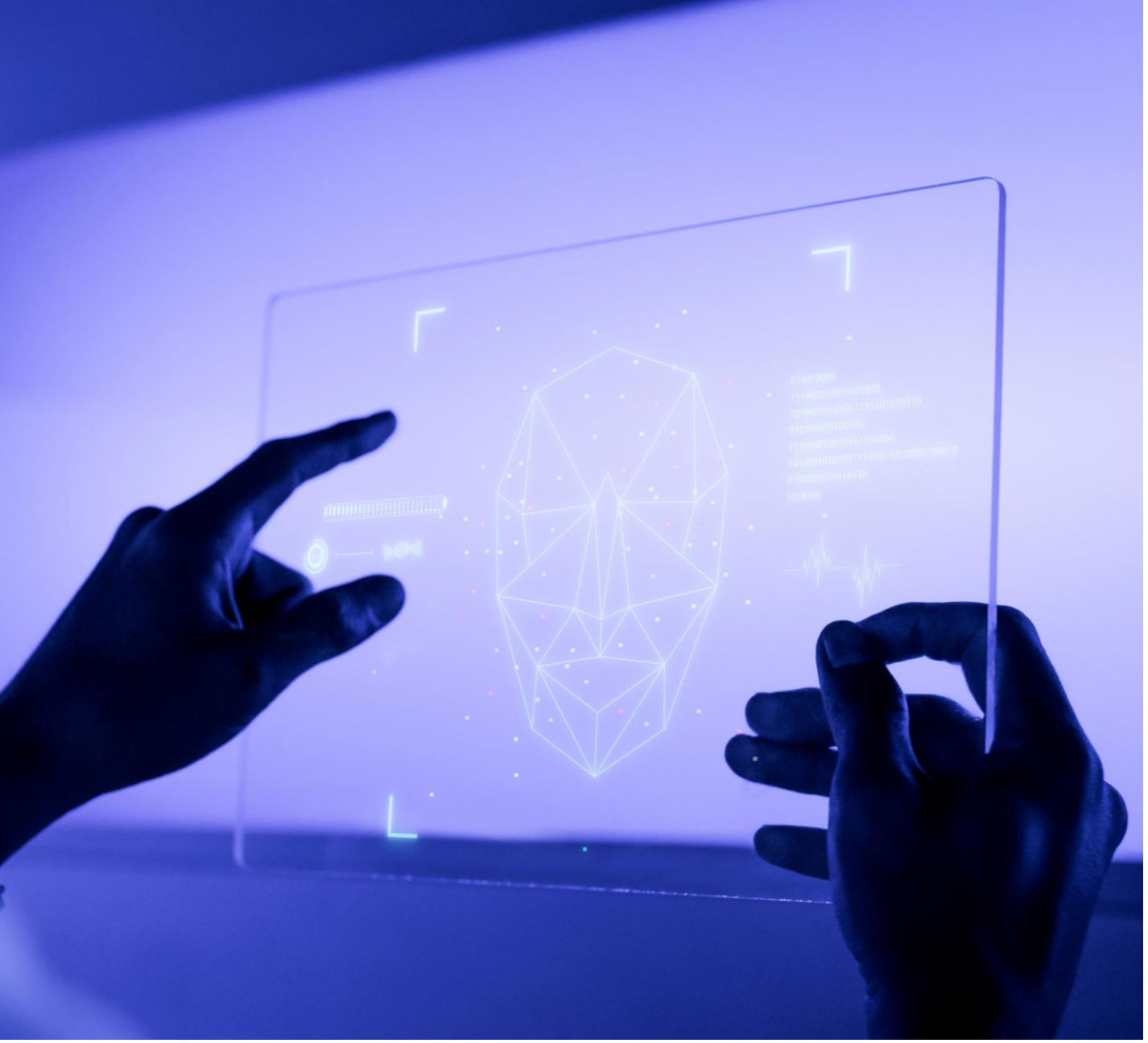
- **Age:** a guess at an age
- **Blur:** how blurred the face is (which can be an indication of how likely the face is to be the main focus of the image)
- **Emotion:** what emotion is displayed
- **Exposure:** aspects such as underexposed or over exposed and applies to the face in the image and not the overall image exposure
- **Facial hair:** the estimated facial hair presence
- **Glasses:** if the person is wearing glasses
- **Hair:** the hair type and hair color
- **Head pose:** the face's orientation in a 3D space
- **Makeup:** whether the face in the image has makeup applied
- **Noise:** refers to visual noise in the image. If you have taken a photo with a high ISO setting for darker settings, you would notice this noise in the image. The image looks grainy or full of tiny dots that make the image less clear
- **Occlusion:** determines if there may be objects blocking the face in the image
- **Smile:** whether the person in the image is smiling

Azure Resources for Face

Face



Cognitive Services



Tips

- **image format** – JPEG, PNG, GIF, and BMP
- **file size** – 6 MB or smaller
- **face size range** – from 36 x 36 up to 4096 x 4096
- **other issues** – extreme face angles, occlusion (objects blocking the face such as sunglasses or a hand). Best results: full-frontal

Lab4: Face Recognition

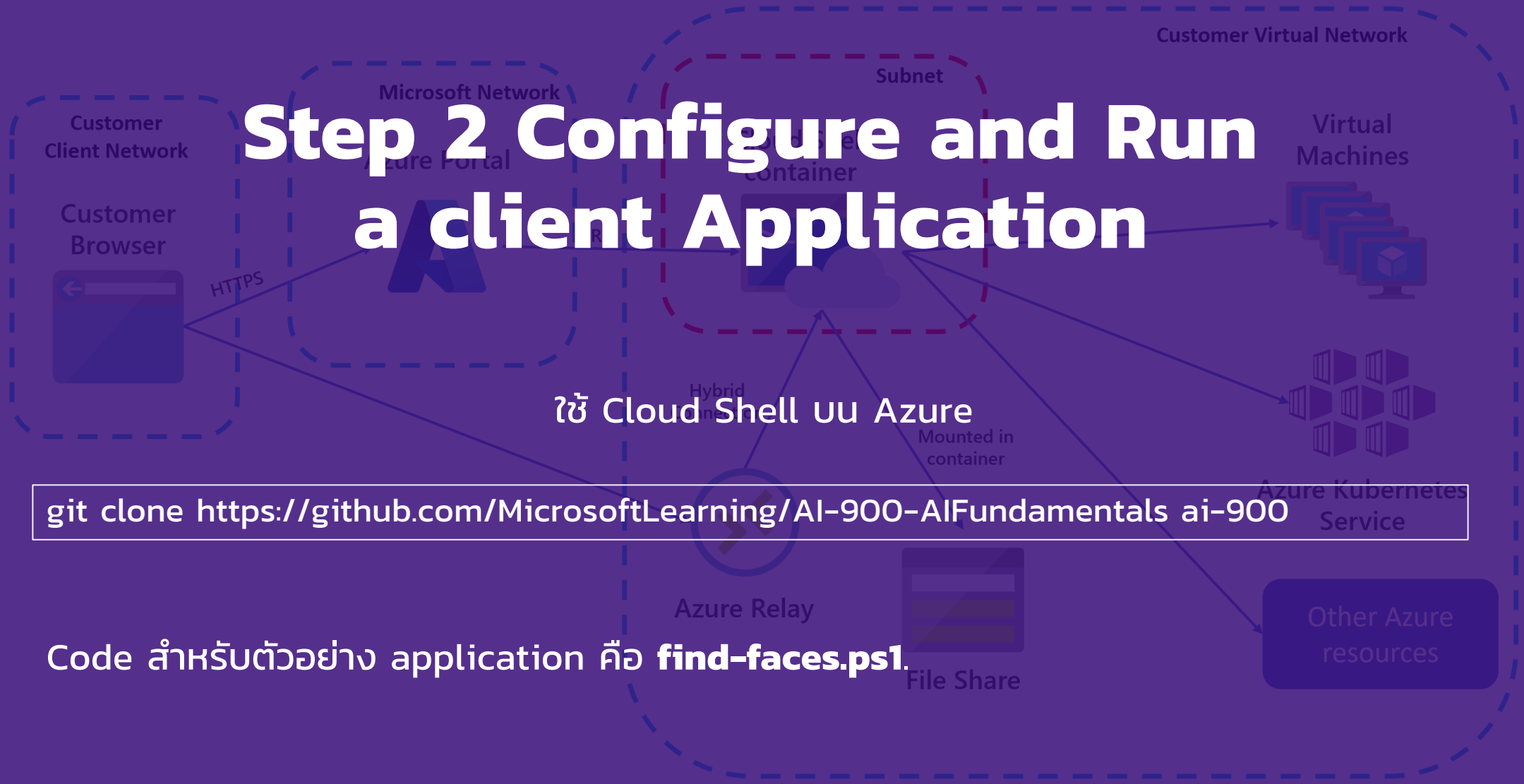
เป้าหมาย:

- Monitor ร้านค้าผ่านกล้อง หรือการตรวจจับภาพ เพื่อระบุหาลูกค้าในร้านที่ต้องการความช่วยเหลือ ผ่านการวิเคราะห์ Face

- Tool: Face Service


Step 1 Create a *Cognitive Services* Resource

Step 2 Configure and Run a client Application



ใช้ Cloud Shell บน Azure

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

Code สำหรับตัวอย่าง application คือ **find-faces.ps1**.

Step 3 เรียกใช้ Face service เพื่อ analyze images

```
./find-faces.ps1 store-camera-1.jpg
```

```
Analyzing image...

Face location: @{top=133; left=339; width=94; heigh
t=94}
 - Age:34
 - Emotions: @{anger=0; contempt=0; disgust=0; fear
=0; happiness=1; neutral=0; sadness=0; surprise=0}
```

https://docs.microsoft.com/en-us/learn/modules/detect-analyze-faces/3-create-face-solutions

Step 4 ทดลองกับภาพอื่นๆ และดูผลลัพธ์

```
./find-faces.ps1 store-camera-2.jpg
```

```
./find-faces.ps1 store-camera-3.jpg
```

https://docs.microsoft.com/en-us/learn/modules/detect-analyze-faces/3-create-face-solutions

End of Lab4

- Face Documentation: https://docs.microsoft.com/en-us/azure/cognitive-services/computer-vision/index-identity

Thank you