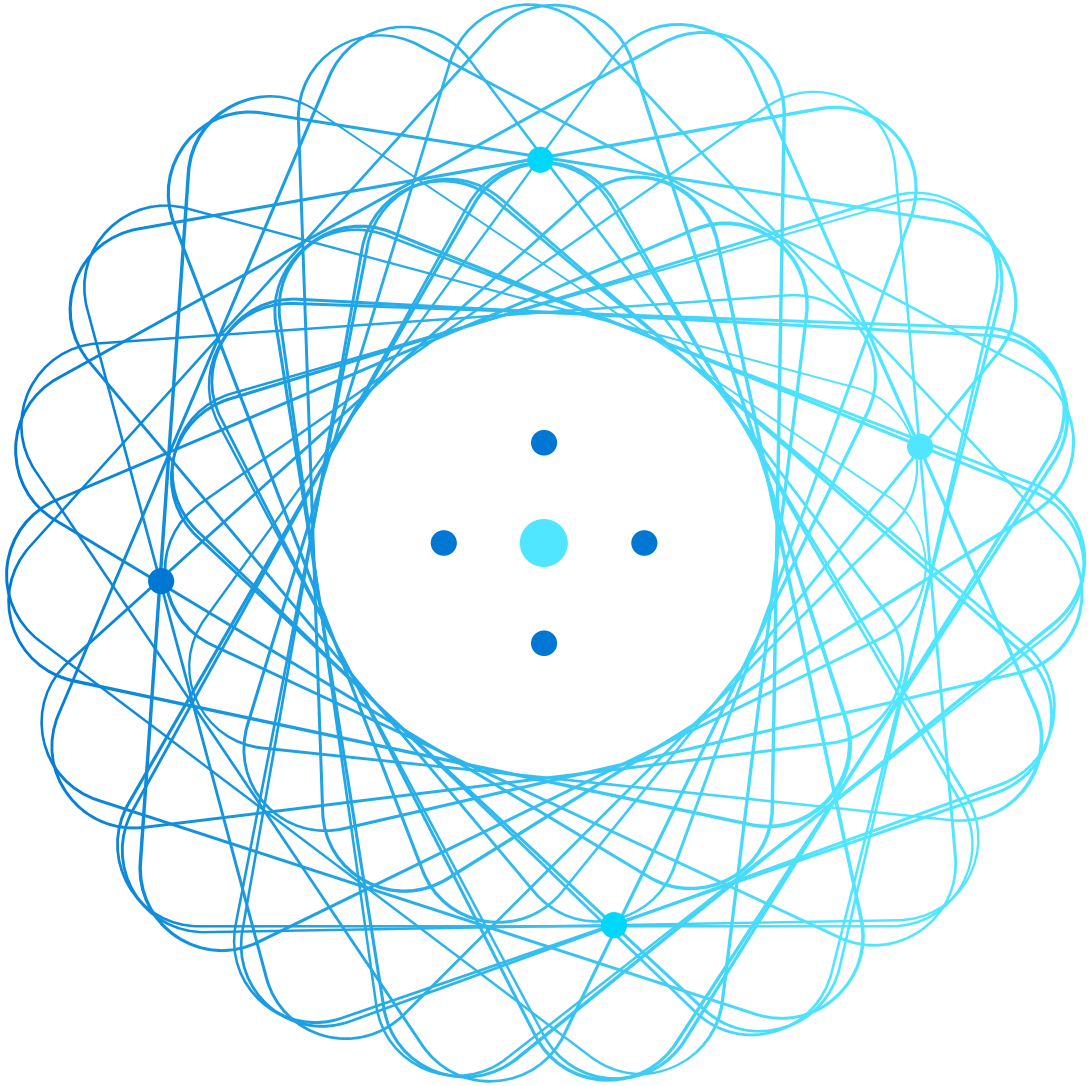
Microsoft Azure

Explore Fundamentals of Computer Vision



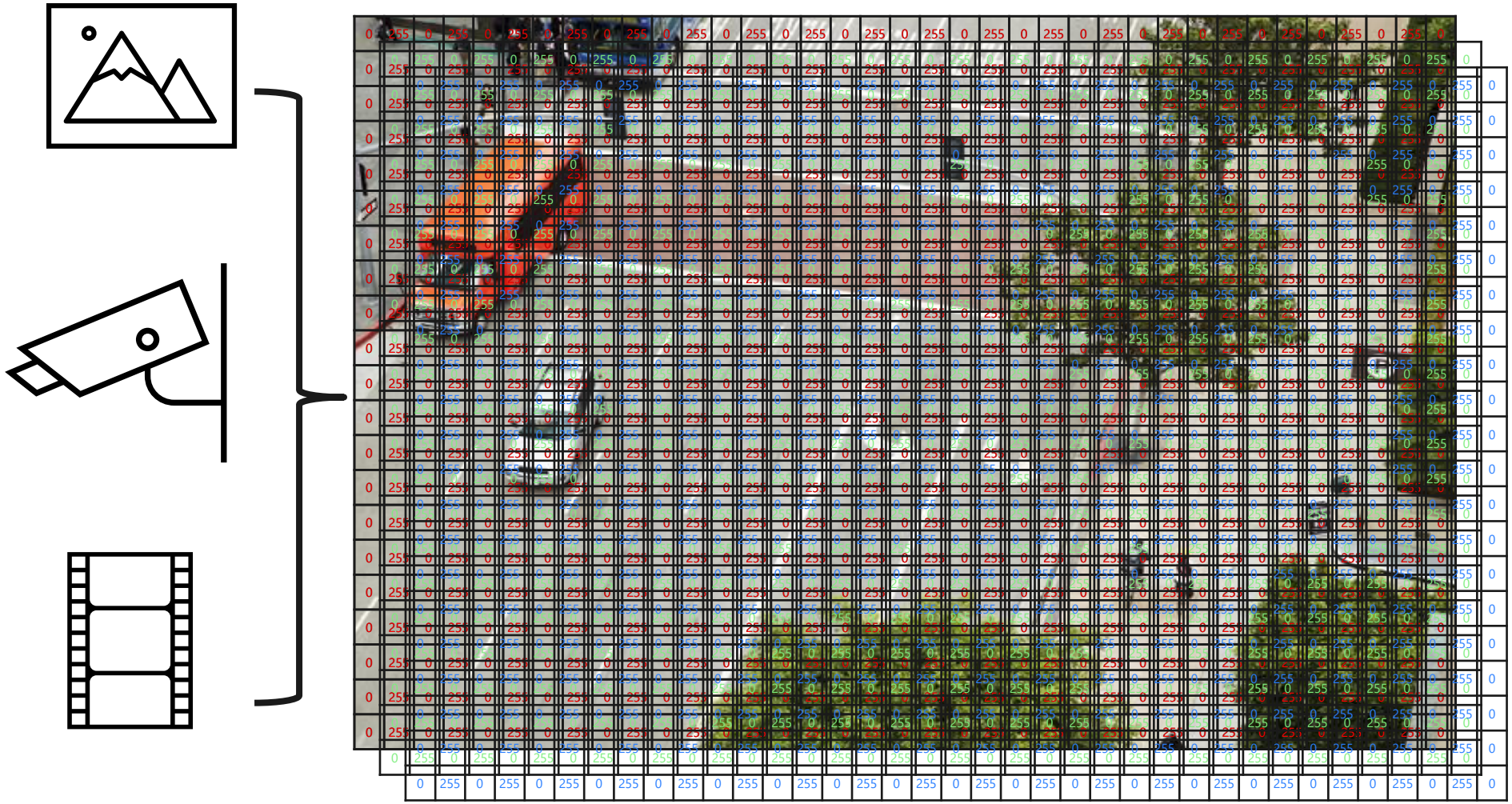
Agenda

Computer Vision Concepts

Creating Computer Vision solutions in Azure

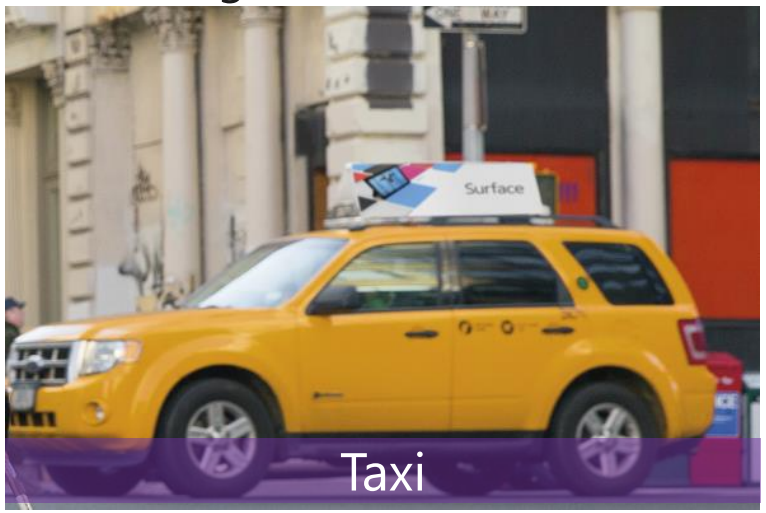
Computer Vision Concepts

What is Computer Vision?

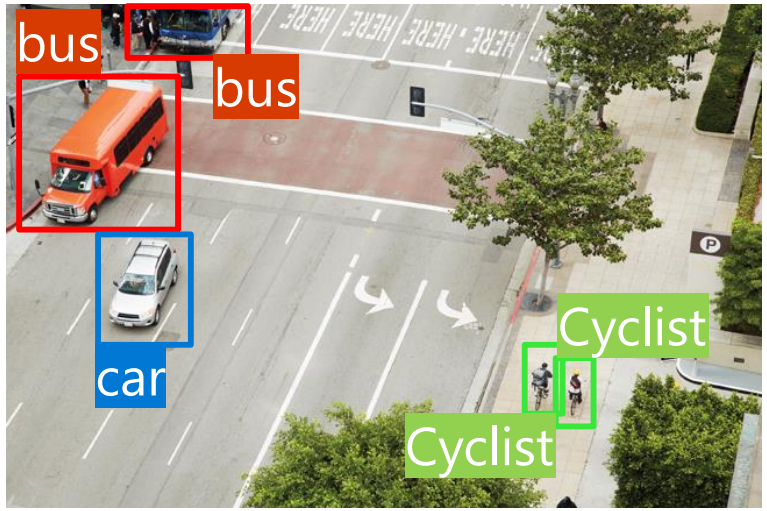


Applications of Computer Vision

Image Classification



Object Detection



Semantic Segmentation

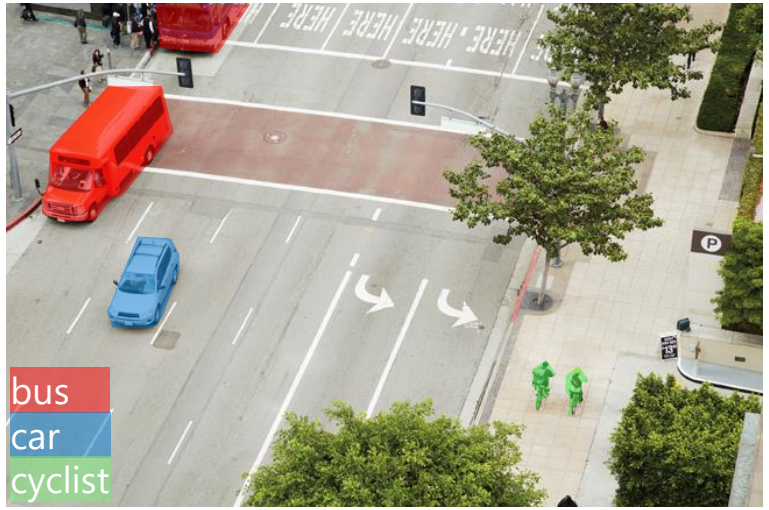
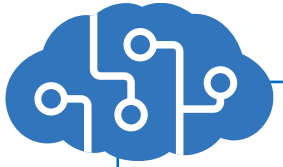


Image Analysis

Face Detection & Recognition

Optical Character Recognition

Computer Vision Services in Azure

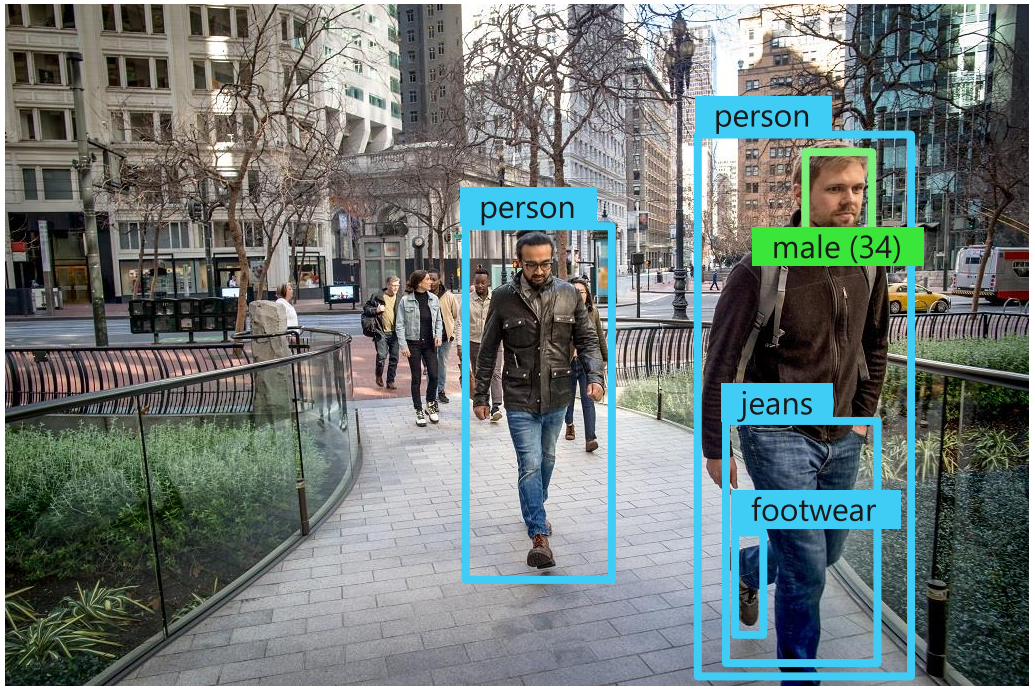


Computer Vision	• Image analysis – automated captioning and tagging • Common object detection • Face detection • Smart cropping • Optical character recognition
Custom Vision	• Custom image classification • Custom object detection
Face	• Face detection and analysis
Form Recognizer	• Data extraction from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

Creating Computer Vision solutions in Azure

Image Analysis with the *Computer Vision* Service

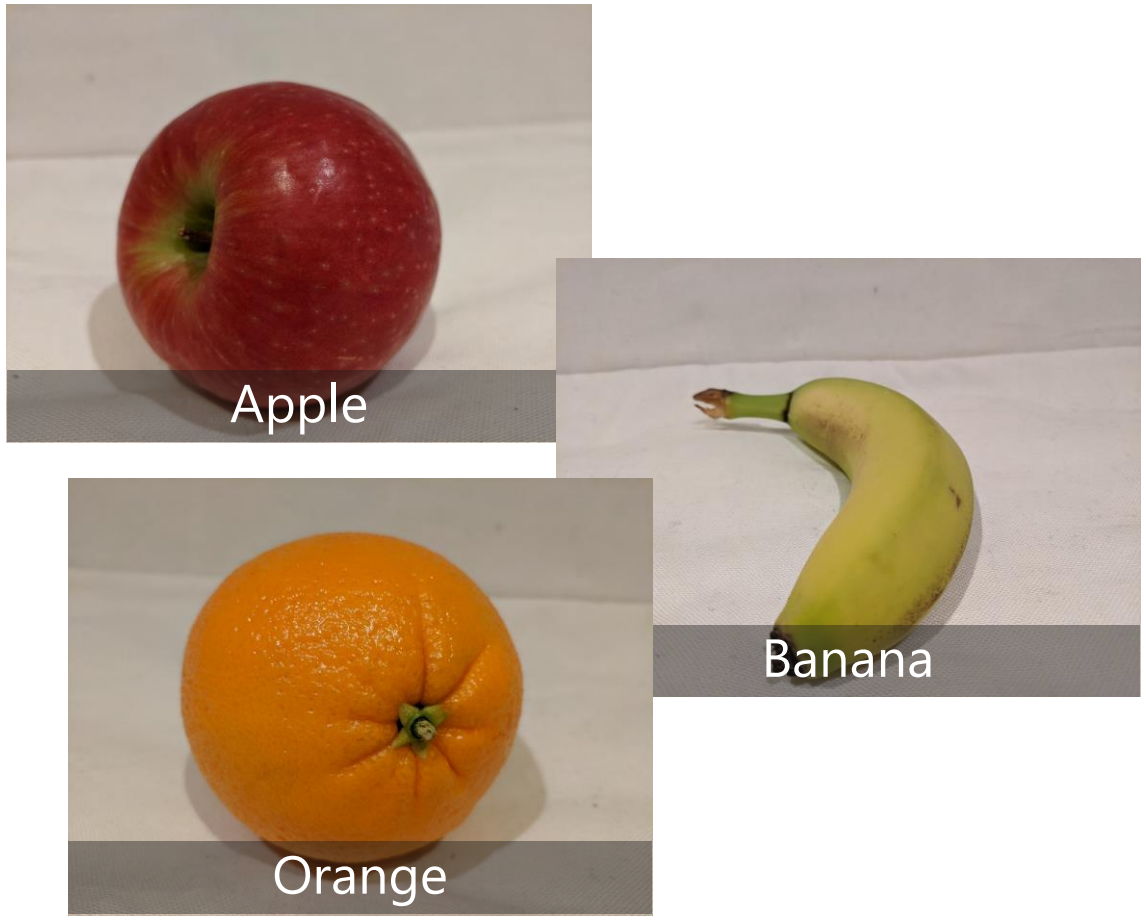
- Pre-trained computer vision model
- Object detection for over 10,000 predefined classes
- Image description and tag generation
- Face detection and analysis
- Content moderation
- Text detection and OCR



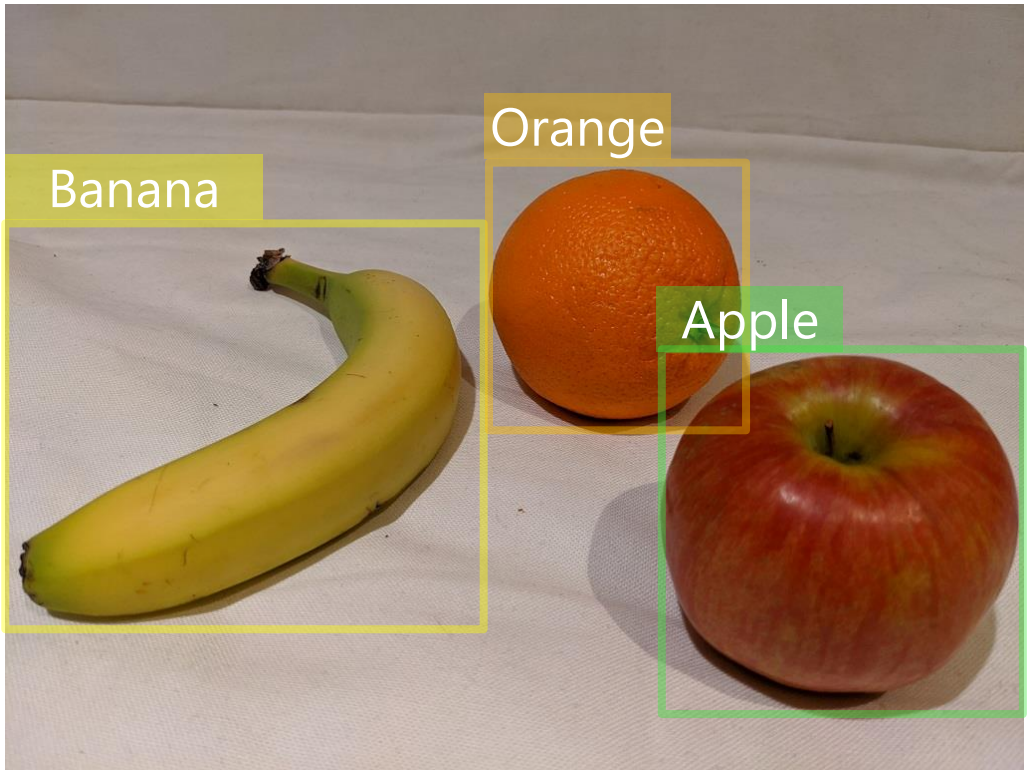
Caption: a group of people walking on a sidewalk
Tags: building, jeans, street, outdoor, jacket, city, person
Ratings: *Adult*: False, *Racy*: False, *Gore*: False

Training Models with the *Custom Vision* Service

Image Classification



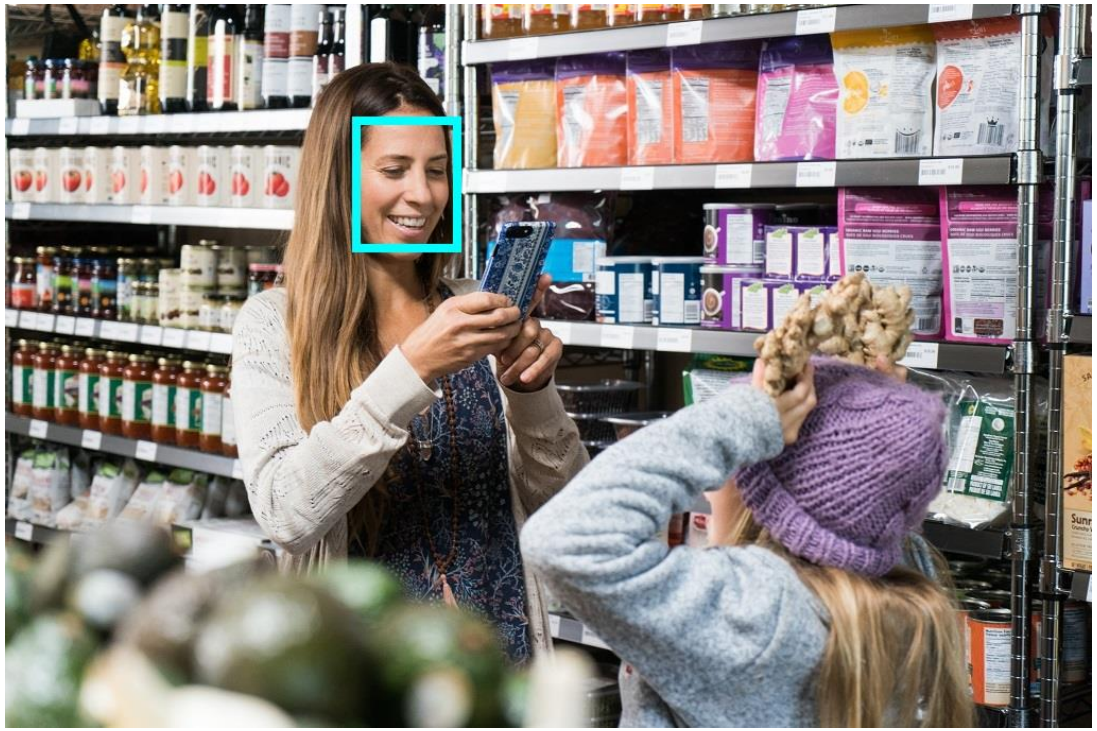
Object Detection



Detecting Faces with the *Face* Service

Anyone can use the Face service to detect:

- Blur
- Exposure
- Glasses
- Head pose
- Noise
- Occlusion



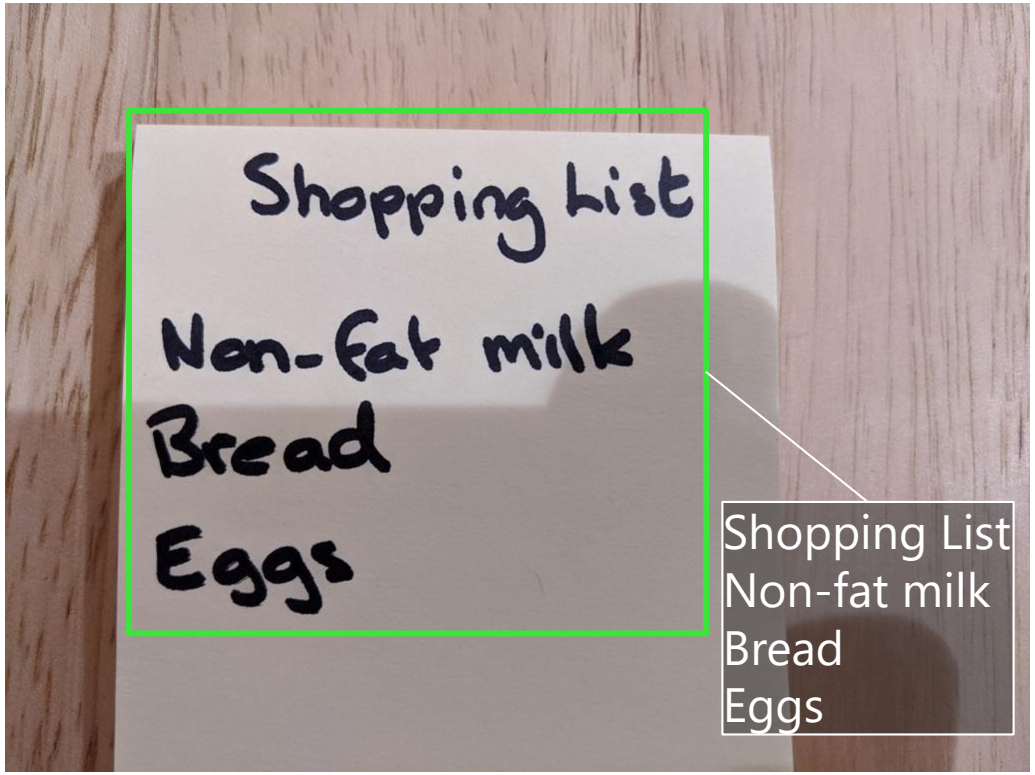
Only Managed Microsoft customers can access facial recognition capabilities:

- Similarity matching
- Identity verification

*To support Microsoft's Responsible AI Principles, Facial Recognition is under a Limited Access policy.

Reading Text with the *Computer Vision* Service

- Detect the location of text:
  - Printed
  - Handwritten
- Options for quick text extraction from images, or asynchronous analysis of larger scanned documents



Analyzing Forms with the *Form Recognizer* Service

- Extract information from scanned forms in image or PDF format
  - Use the pre-trained models for common document types
  - Train a custom model using your own forms
- Models perform *semantic recognition* of form fields – not just text extraction

Lab: Explore Computer Vision

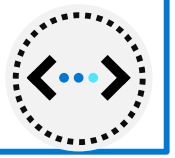
In this lab, you will explore the **Computer Vision** cognitive service to analyze images.

1. Start the virtual machine for this lab

   or go to the exercise page at https://aka.ms/ai900-computer-vision-lab

2. Follow the instructions to complete the exercise

   Use the Azure subscription provided for this lab



Review

You plan to use build an application that compares faces for similarity and identifies individuals. What service would you use?

- ❑ Computer Vision
- ☑ Face
- ❑ Custom Vision

You want to use the Custom Vision and Language service. You also want developers to require only one key and endpoint to access all your services. What kind of resource should you create in Azure?

- ☑ Cognitive Services
- ❑ Language
- ❑ Custom Vision

You want to extract information *and* perform semantic recognition on the extracted fields. What service would you use?

- ❑ Computer Vision
- ❑ Optical Character Recognition
- ☑ Form Recognizer

Summary

Computer Vision Concepts

- What is Computer Vision?
- Applications of Computer Vision
- Computer Vision Services in Azure

Creating Computer Vision solutions in Azure

- Image Analysis with the Computer Vision Service
- Training Models with the Custom Vision Service
- Detecting Faces with the Face Service
- Reading Text with the Computer Vision Service
- Analyzing Forms with the Form Recognizer Service

References

Explore Computer Vision

https://aka.ms/explore-computer-vision

Microsoft Azure