ConFoo.CA 20

AI to the Edge with Azure Percept

RON DAGDAG

See no evil
Hear no evil
Speak no evil

Misaru
Kikasaru
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Agenda

- What is AI enabled IOT?
- What is Azure Percept?
- Capabilities of Azure Percept
- Demo

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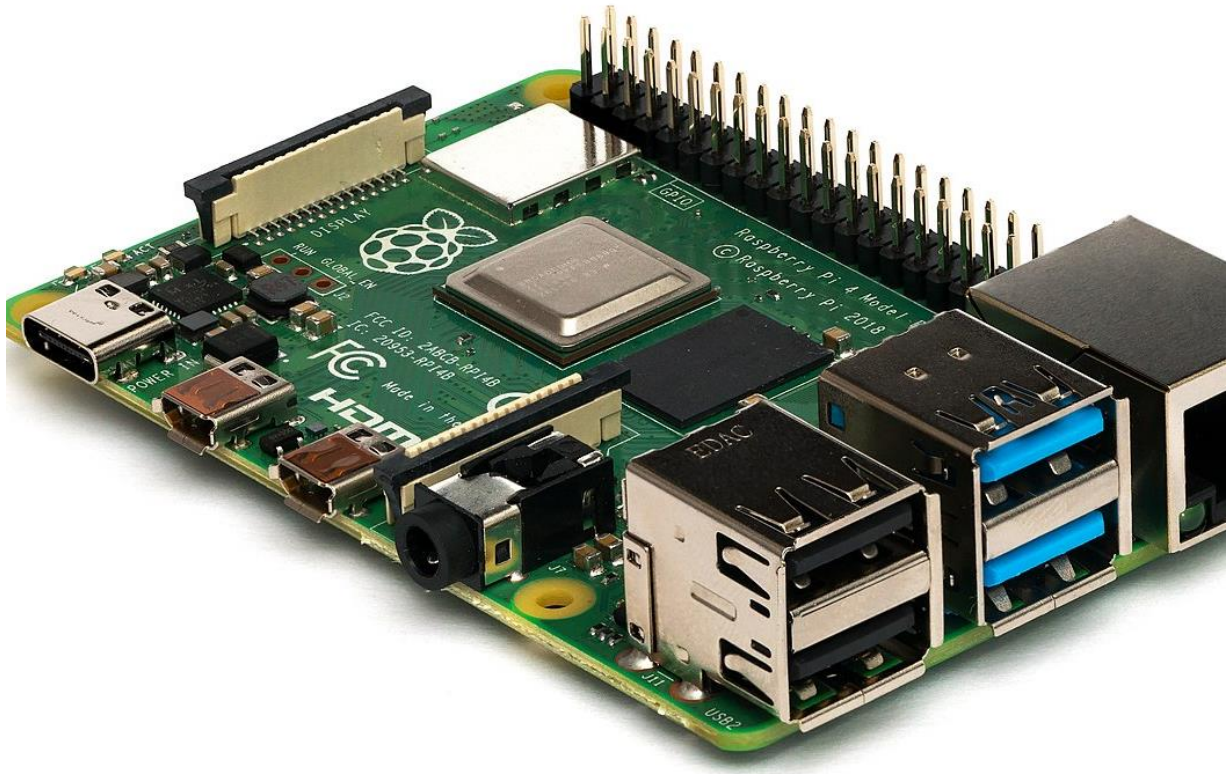
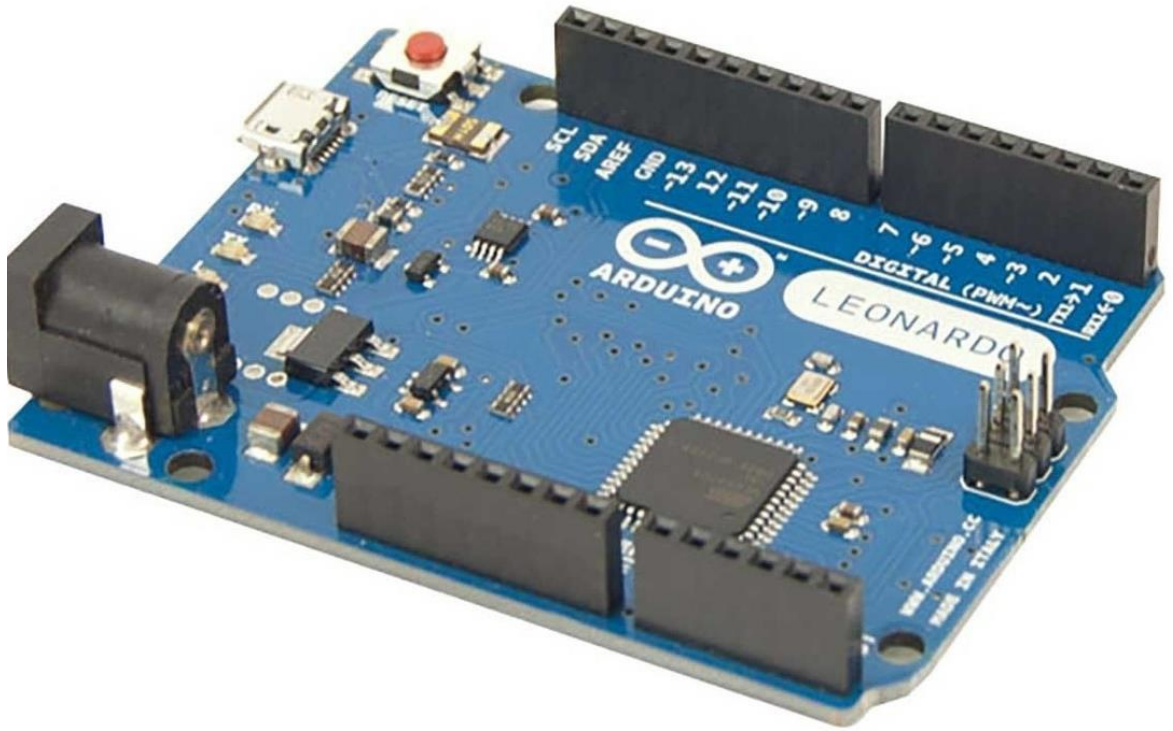
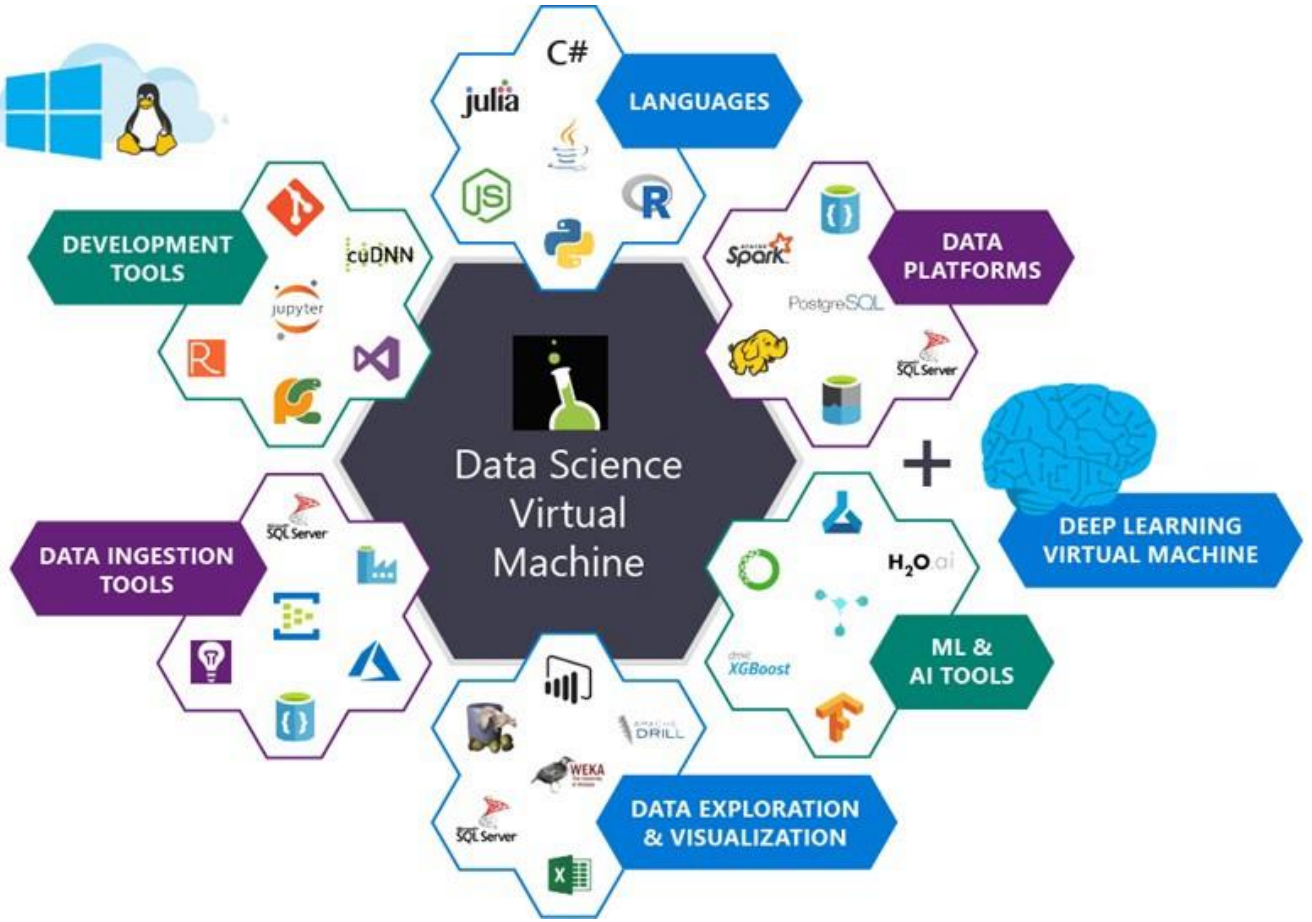
Internet Of Things





Computer Vision and Machine Learning

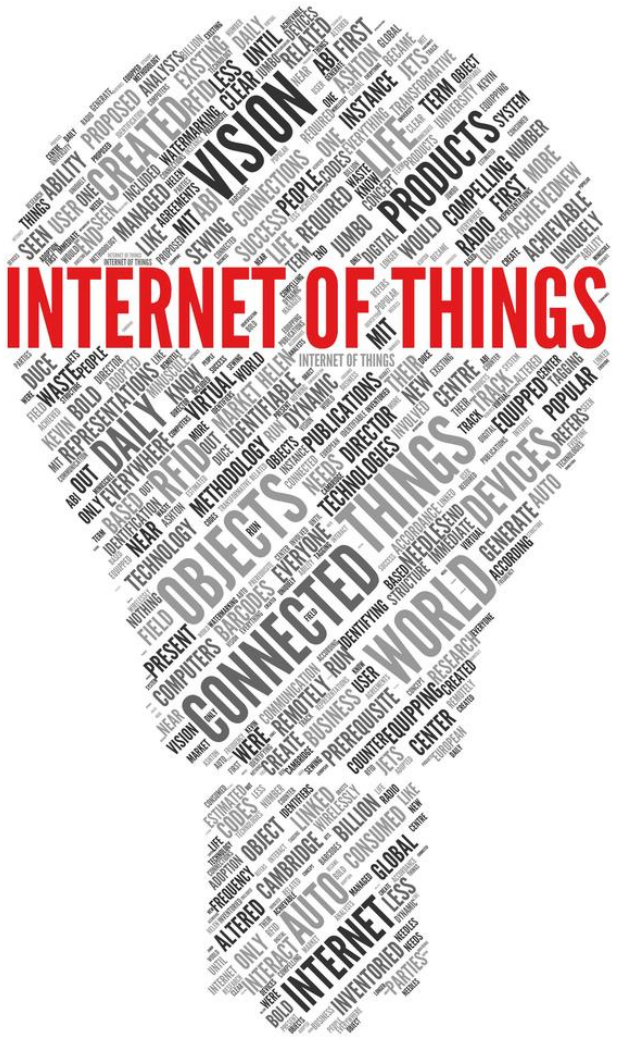


OpenCV

OpenVINO

What is IOT?
Internet of Things

- connecting the Internet to the physical world via sensors
- Kevin Ashton in 1999
- any device that interacts with the physical world around it



Remotely Monitor

- Gather Data
- Edge Processing
- Device Status

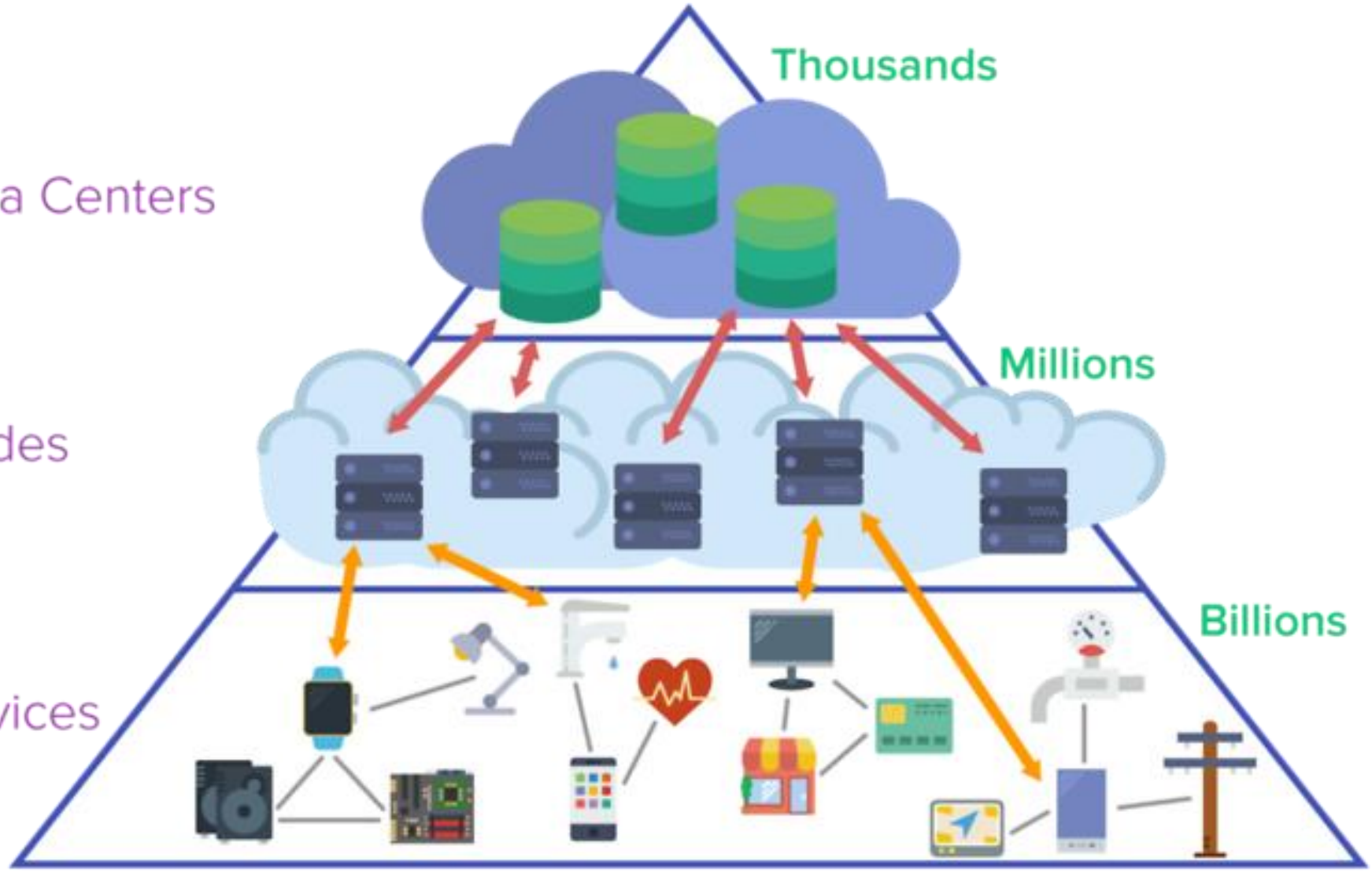
Control Device

- Send Commands
- Set Device Properties

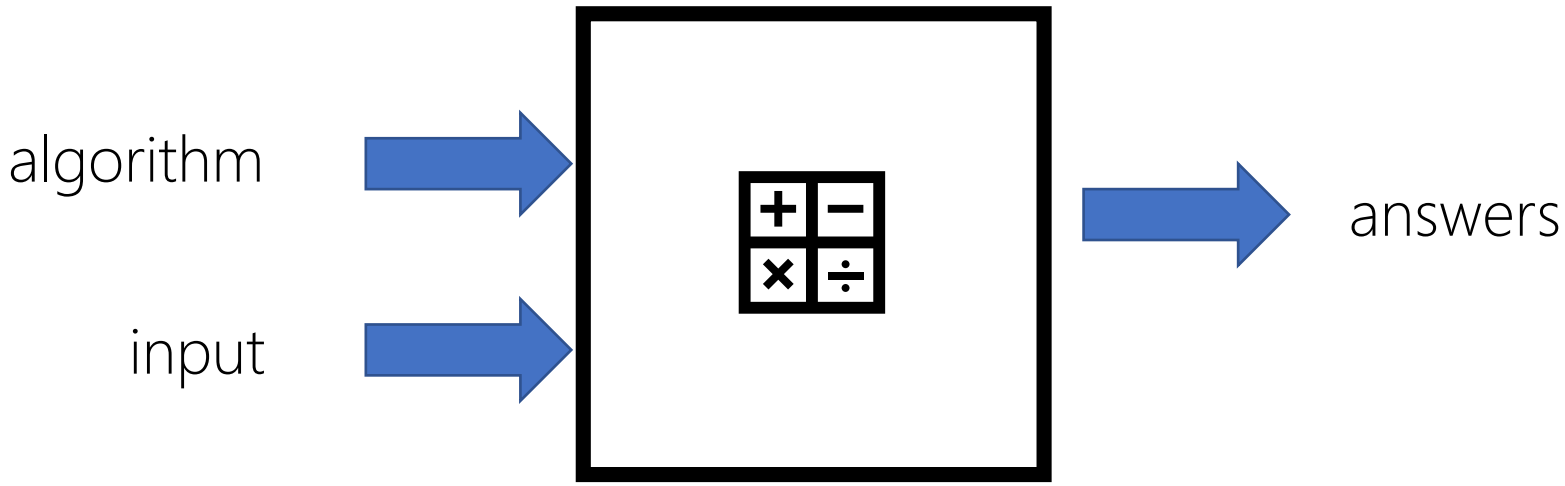
CLOUD | Data Centers

FOG | Nodes

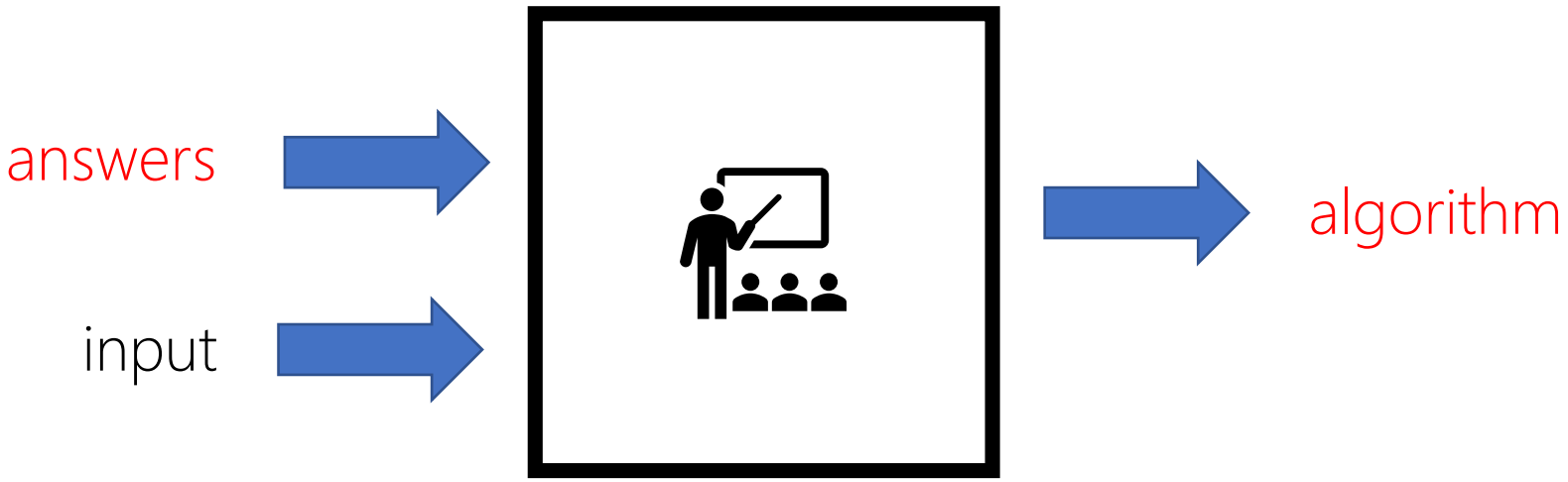
EDGE | Devices



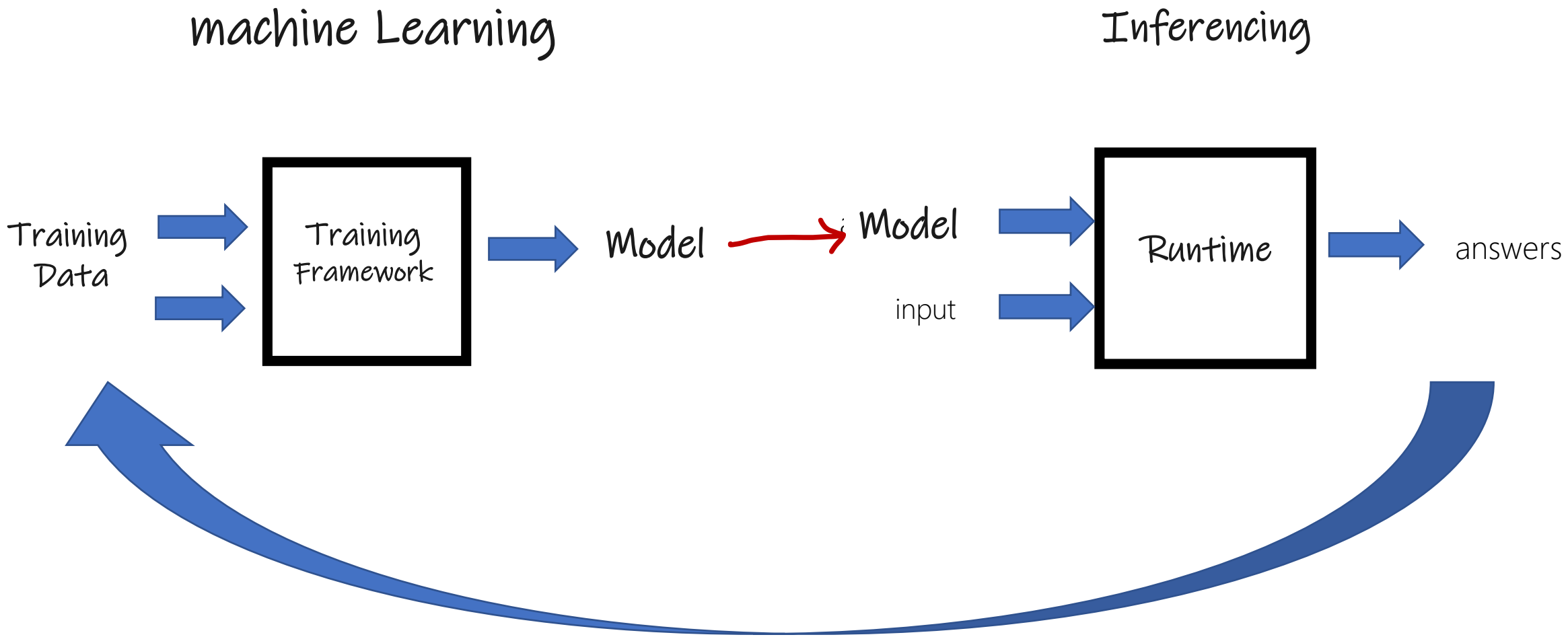
programming



machine learning



ML Primer


machine Learning
Inferencing
Training Data
Training Framework
Model
Model
input
Runtime
answers

Azure Percept Dev Kit

Azure Percept Dev Kit, Vision and Audio

Always Watching

Always Recording

Process
Video Locally

Limited
Recording

Intelligent
Video Analytics

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Azure Percept Vision

- Out-of-the-box AI recognition of common objects. No code required
- AI Acceleration
  - Intel Movidius Myriad X (MA2085) Vision Processing Unit (VPU) with Intel Camera ISP integrated, 0.7 TOPS
- Sensors and Visual Indicators
  - Sony IMX219 Camera sensor with 6P Lens
  - Resolution: 8MP at 30FPS, Distance: 50 cm – infinity
  - FoV: 120-degrees diagonal, Color: Wide Dynamic Range, Fixed Focus Rolling Shutter
- RGB Camera Support

Always Listening

Always Recording

Sound Processing at the edge

Limited Listening

Context Aware

Smart Assistants

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Azure Percept Audio

- Performance
  - 180 Degrees Far-field at 4 m, 63 dB
- Sensors, Visual Indicators, and Components
  - 4x MEM Sensing Microsystems Microphones
  - 2x Buttons, USB Hub, DAC
  - 3x LEDs, LED Driver
- Ports
  - 1x USB 2.0 Type Micro B
  - 3.5 mm Audio Out

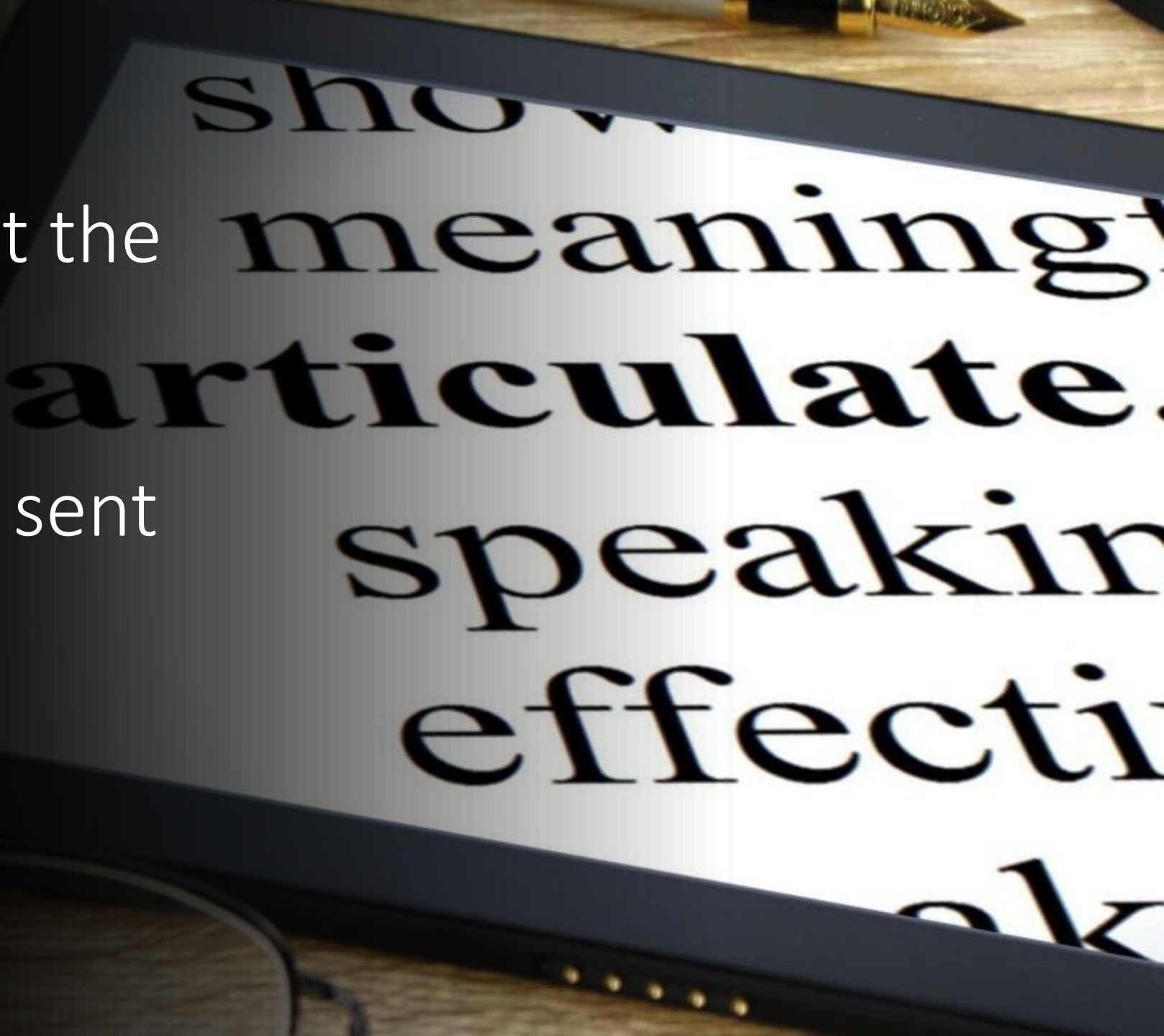
Always Broadcasting

Always Tracking

Data Processing at the Edge

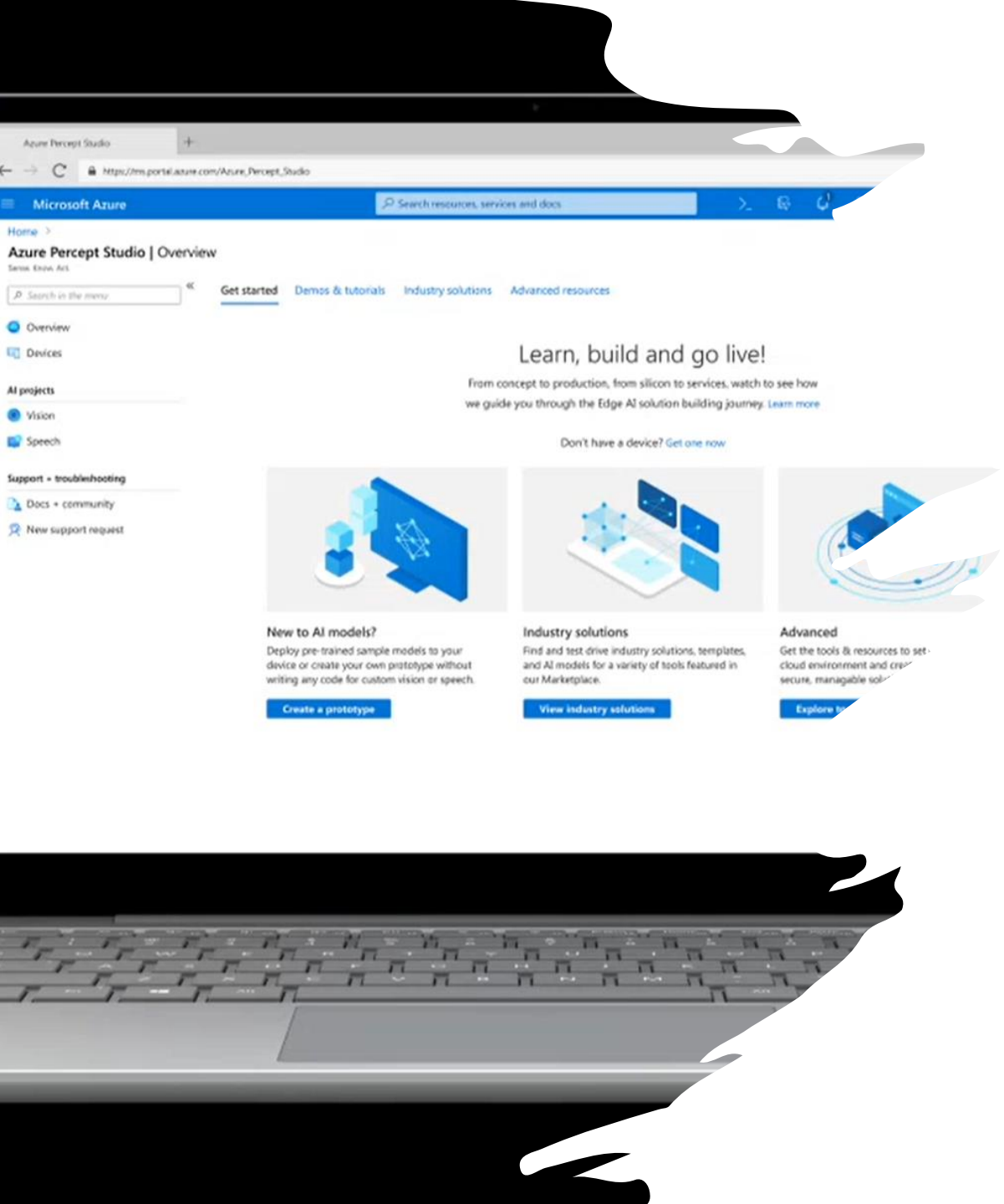
Limit information sent to the Cloud

Intelligent Edge



Azure Percept DK

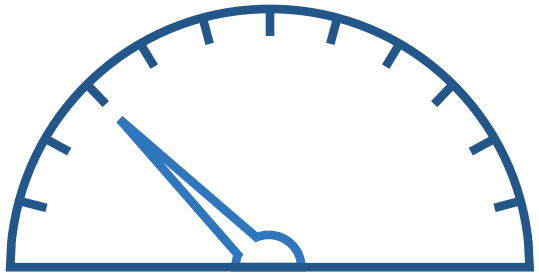
- Processor
  - NXP iMX8m
- Security
  - TPM 2.0 Nuvoton NCPT750
- Connectivity
  - Wi-Fi and Bluetooth via Realtek RTL882CE
- Ports
  - 1x Ethernet
    2x USB-A 3.0
    1x USB-C



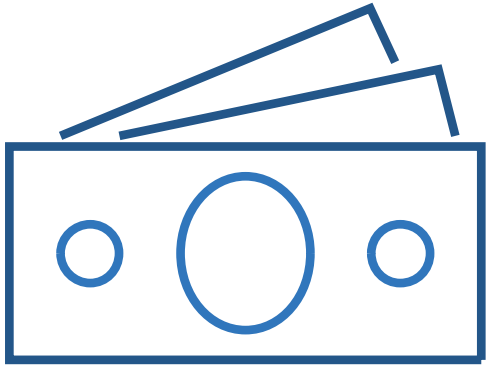
Azure Percept Studio

- Delightful onboarding
- Integrated experiences
- No code flow
- Advanced flow
- Prototype and deploy

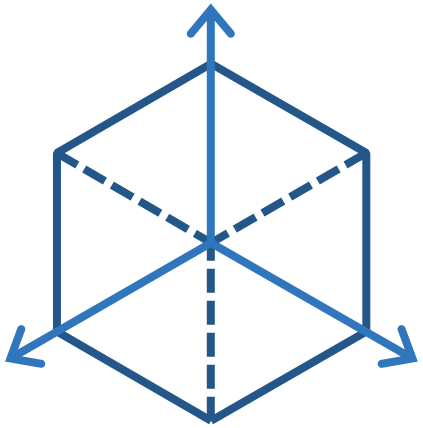
AI on the edge



Low latency

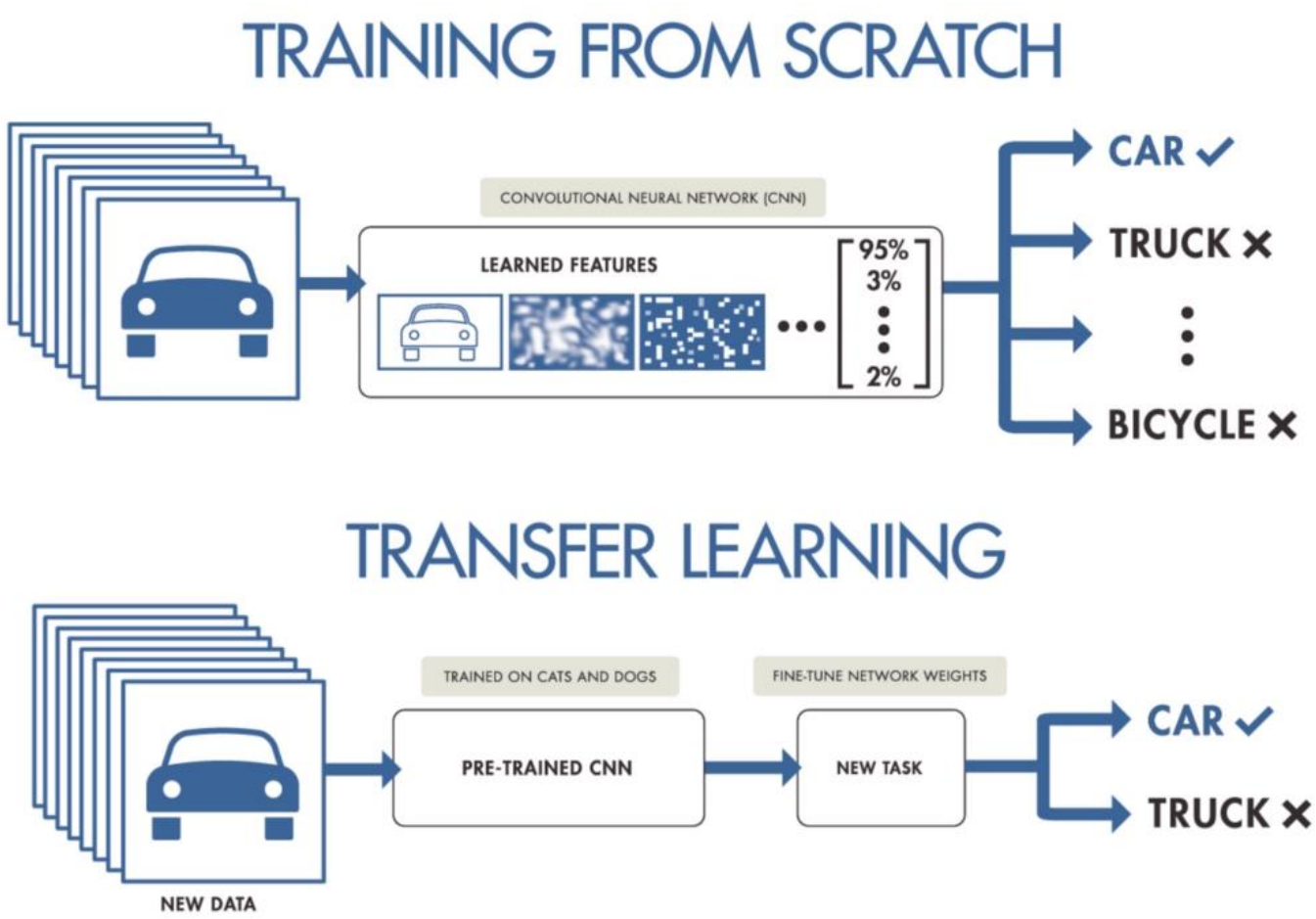


Scalability



Flexibility

What is Transfer Learning?

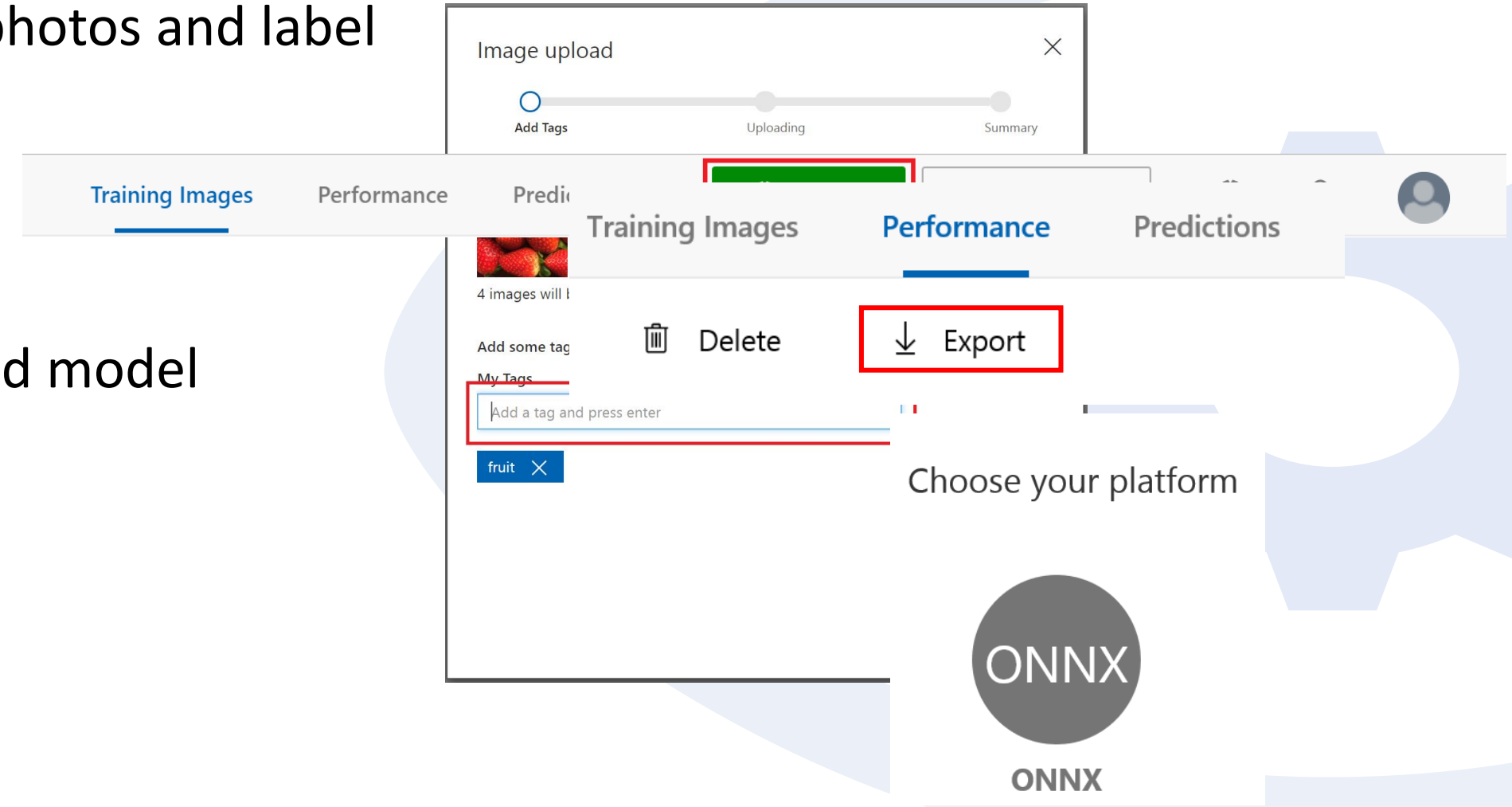


Custom Vision Service: customvision.ai

1. Upload photos and label

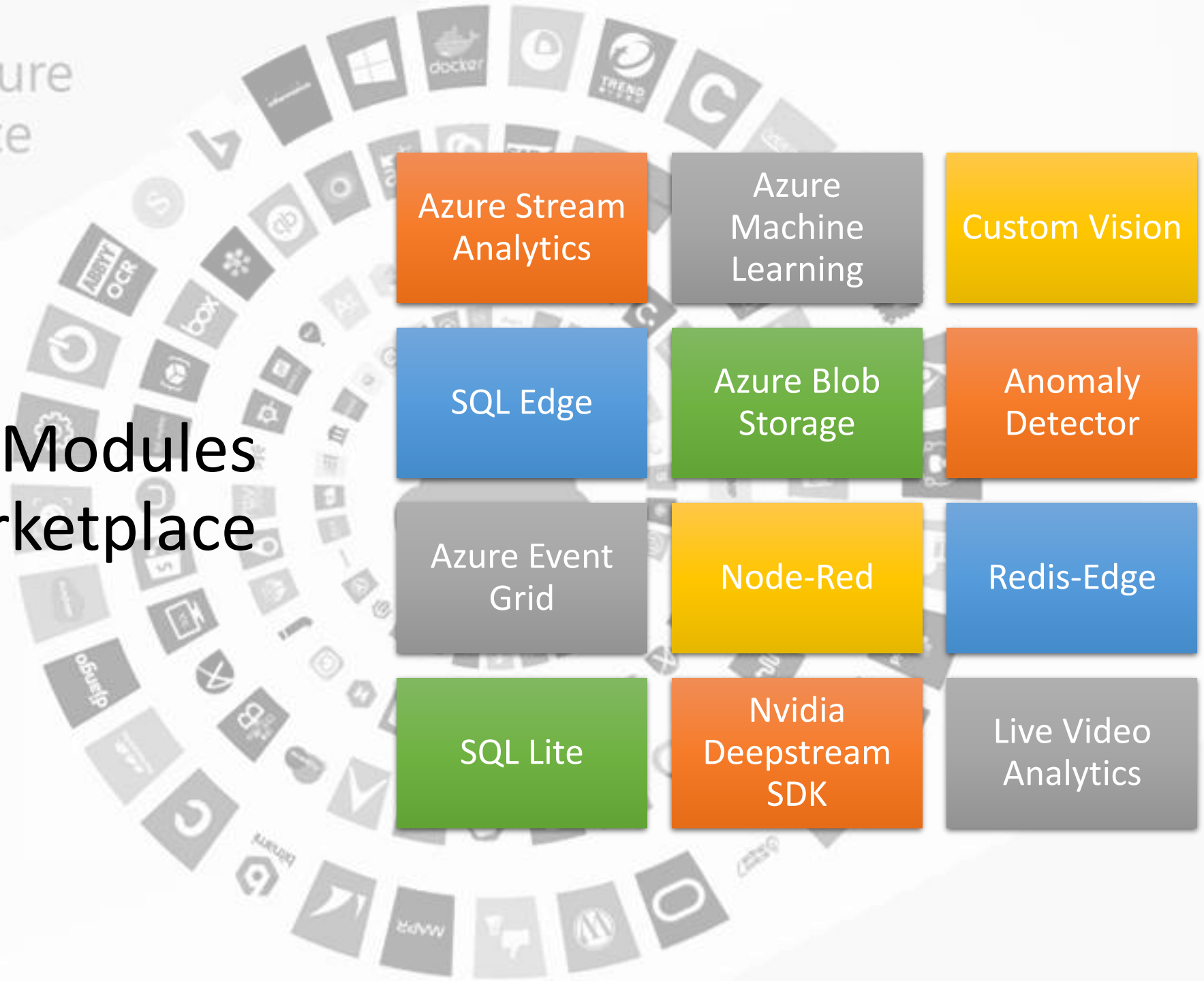
2. Train

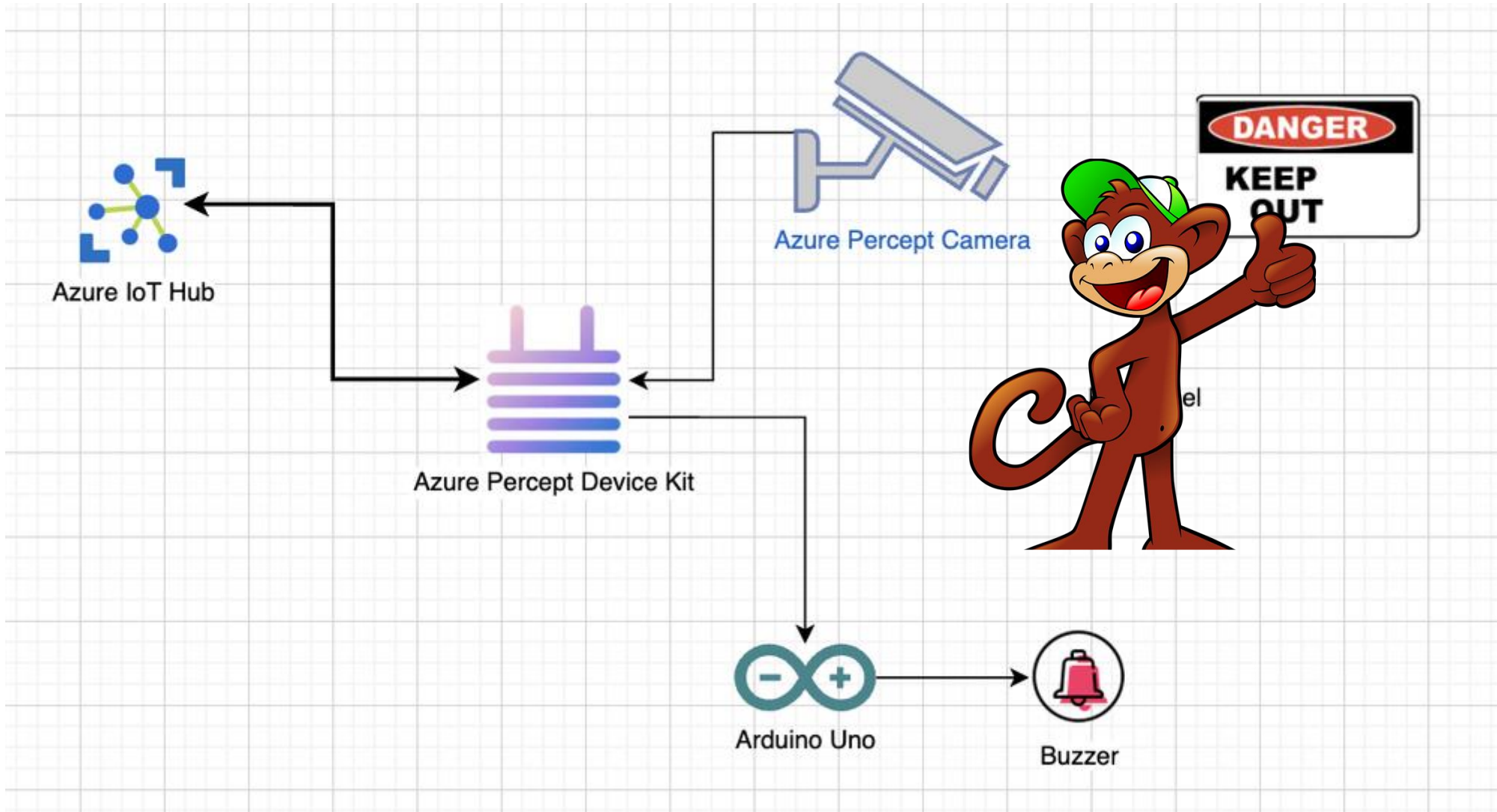
3. Download model



Microsoft Azure Marketplace

IoT Edge Modules Azure Marketplace




Azure IoT Hub
Azure Percept Camera
DANGER
KEEP
OUT
Azure Percept Device Kit
Arduino Uno
Buzzer

Demo

- Azure Percept Studio
- Azure Percept DK
- Azure IoT Hub
- Azure Custom Vision
- ONNX Runtime
- OpenVINO
- Azure Percept Eye Module

Recap

✓What is AI enabled IOT?

AI – Learn from data

IOT - Monitor and Control devices

Process AI workload at the Edge

✓What is Azure Percept?

Easy way to prototype and deploy AI on the Edge

✓Capabilities of Azure Percept

Vision, Audio, Trust Module

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Thanks for geeking out with me about Monkeys and Azure Percept

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