

# Reactor

## Azure Machine Learning 介绍

# Map



# 个人介绍



## Kinfey Lo – (卢建晖)

Microsoft Cloud Advocate

前微软MVP、Xamarin MVP和微软RD，拥有超过10年的云原生、人工智能和移动应用经验，为教育、金融和医疗提供应用解决方案。 Microsoft Ignite, TechEd 会议讲师，Microsoft AI 黑客马拉松教练，目前在微软，为技术人员和不同行业宣讲技术和相关应用场景。



爱编程(Python , C# , TypeScript , Swift , Rust , Go )

专注于人工智能，云原生，跨平台移动开发

Github : <https://github.com/kinfey>

Email : [kinfeylo@microsoft.com](mailto:kinfeylo@microsoft.com) Blog : <https://blog.csdn.net/kinfey>

Twitter : @Ljh8304

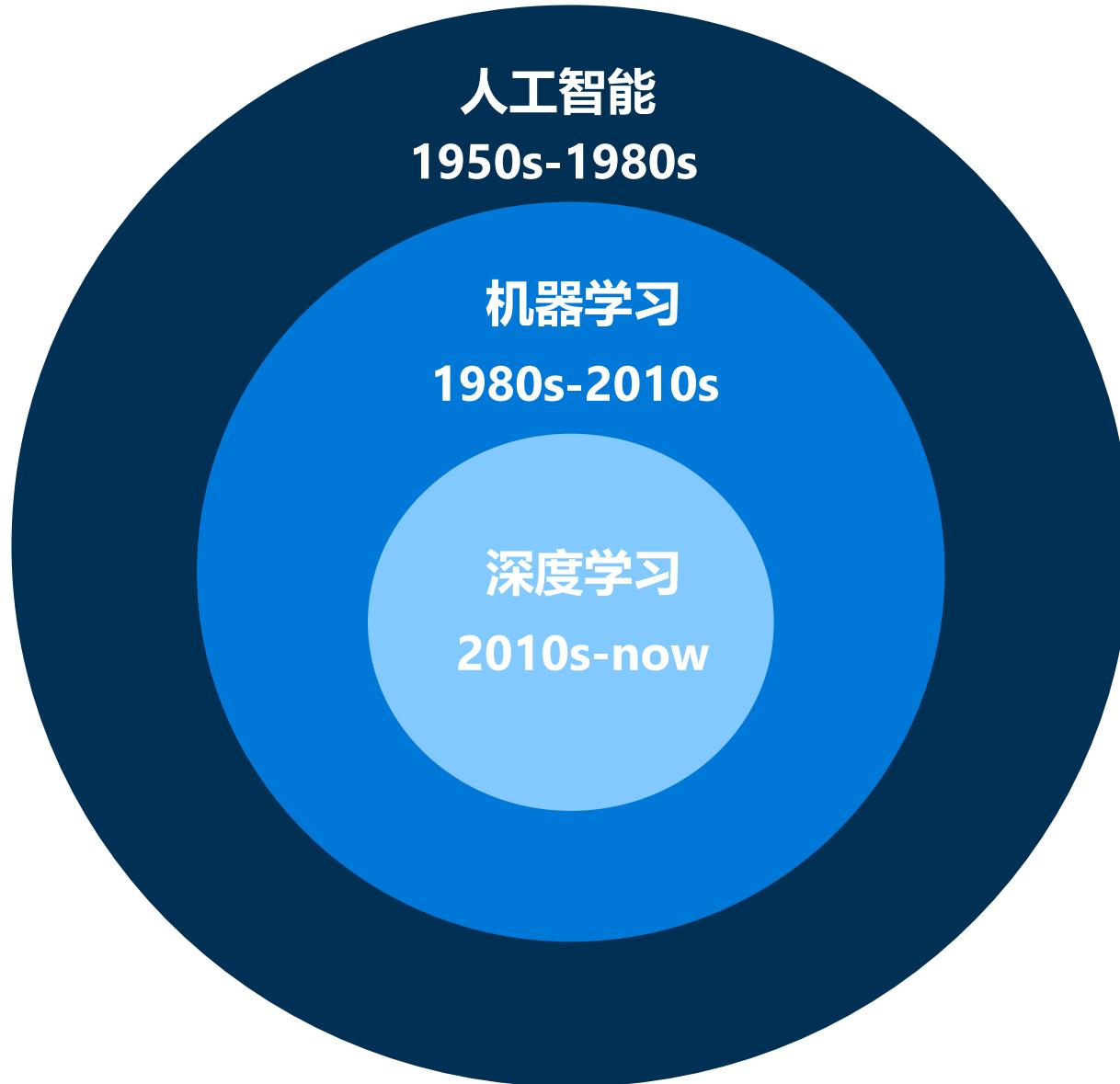
# 一. 再谈人工智能



# AI 技术不断变化



# AI 技术不断变化



## 传统编程

数据



算法



计算



输出

## 机器学习

(特征)



(标签)



计算



(模型)

# 人工智能的热点方向



计算机视觉



翻译

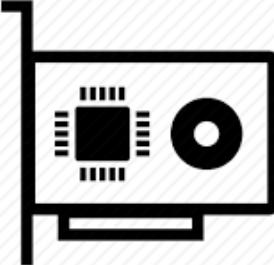


搜索

# 如何做AI ?



Local PC / Laptop

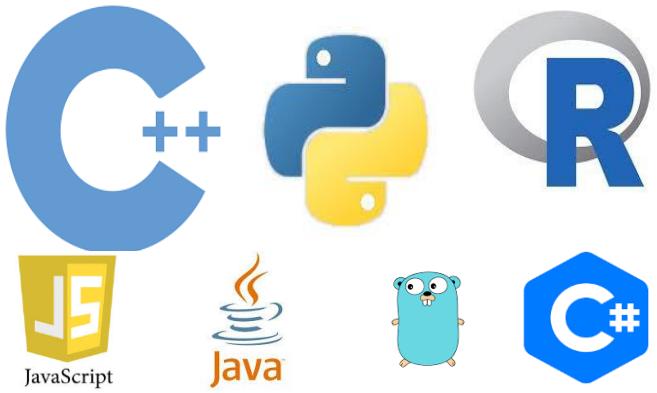


GPU



Cloud Computing

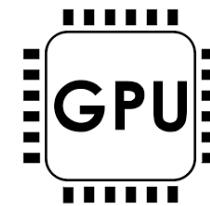
# 人工智能技术栈



语言



框架



硬件

放弃All！！！



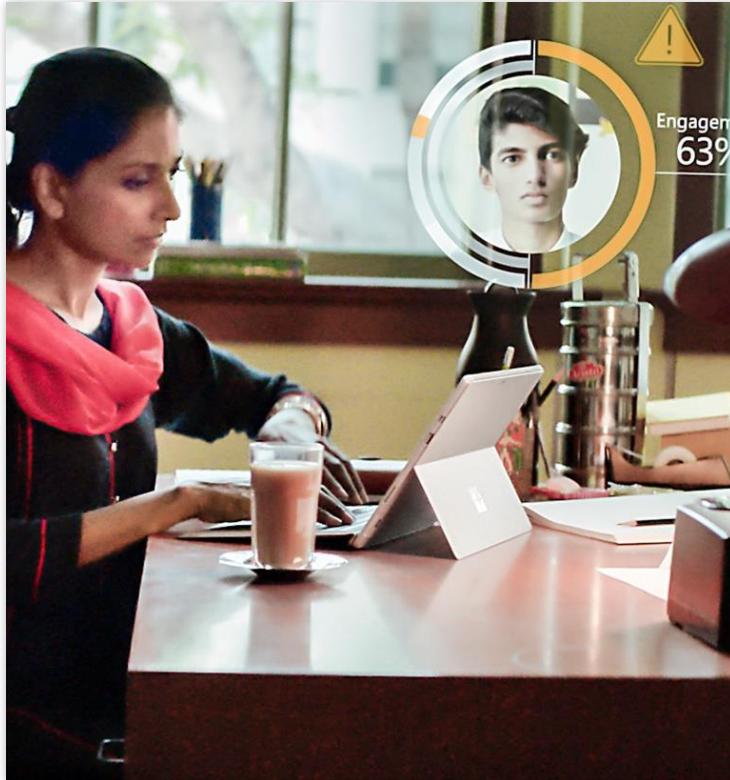
## 二. 微软的 ML



# 驱动AI的主要因素

AI drivers

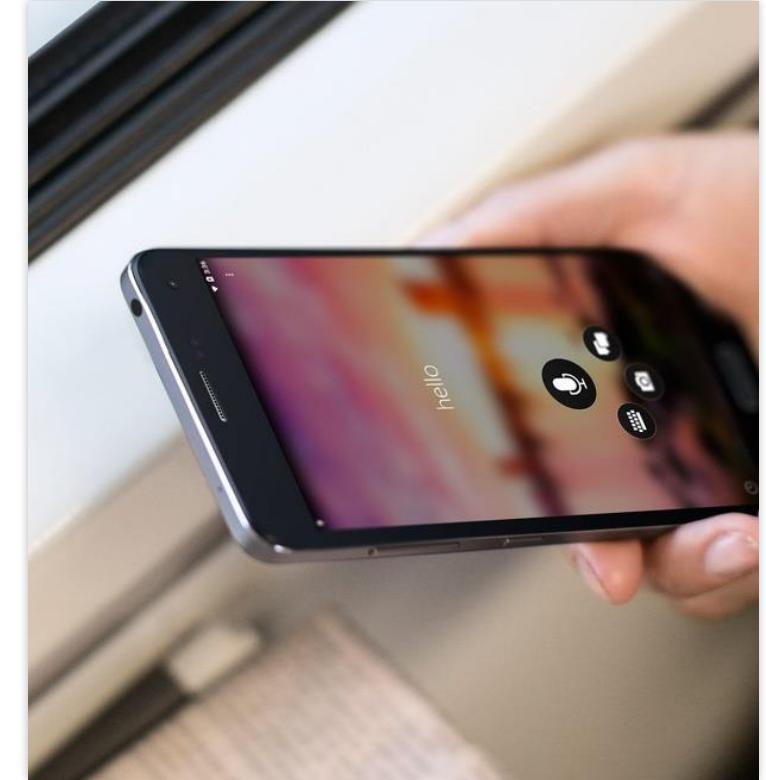
云 Cloud / Compute



数据 Data

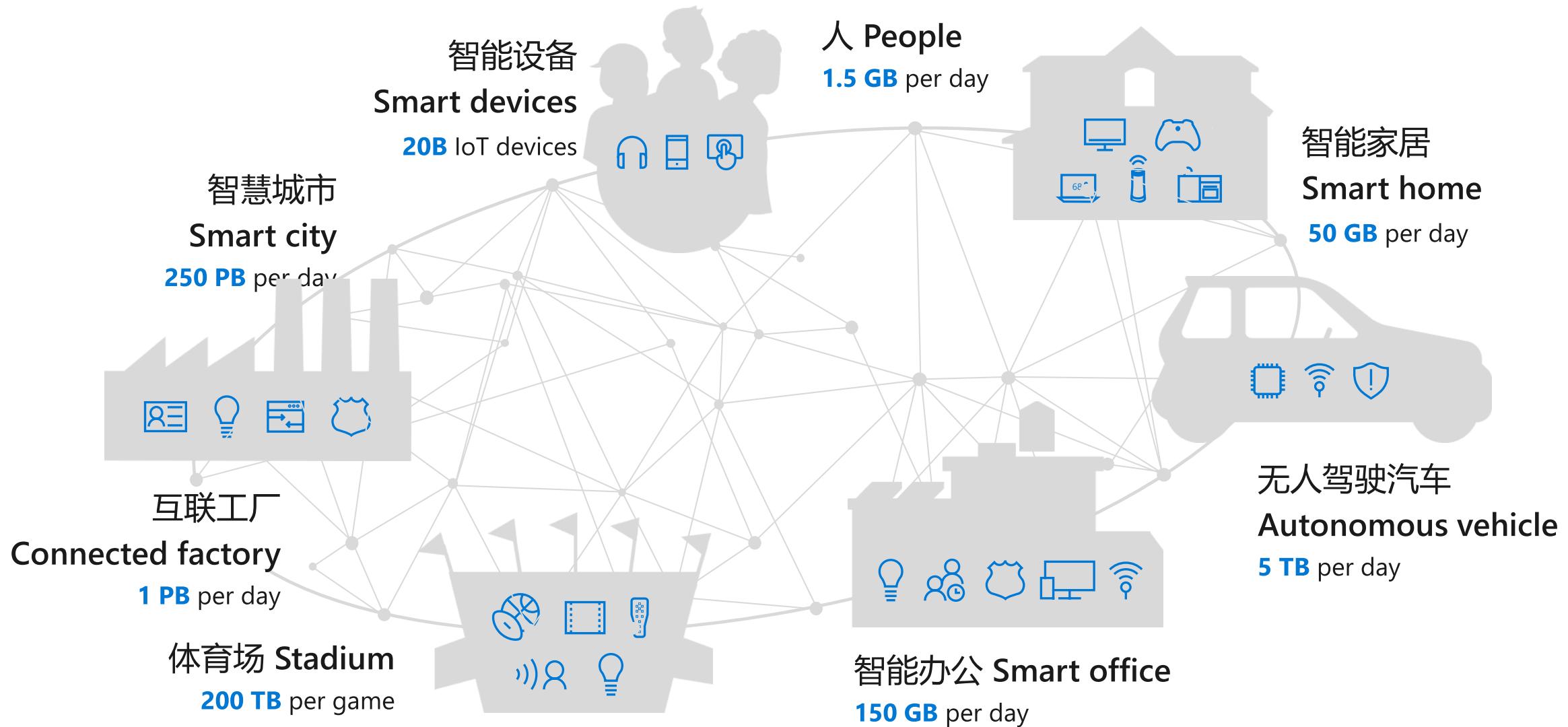


算法 Algorithms

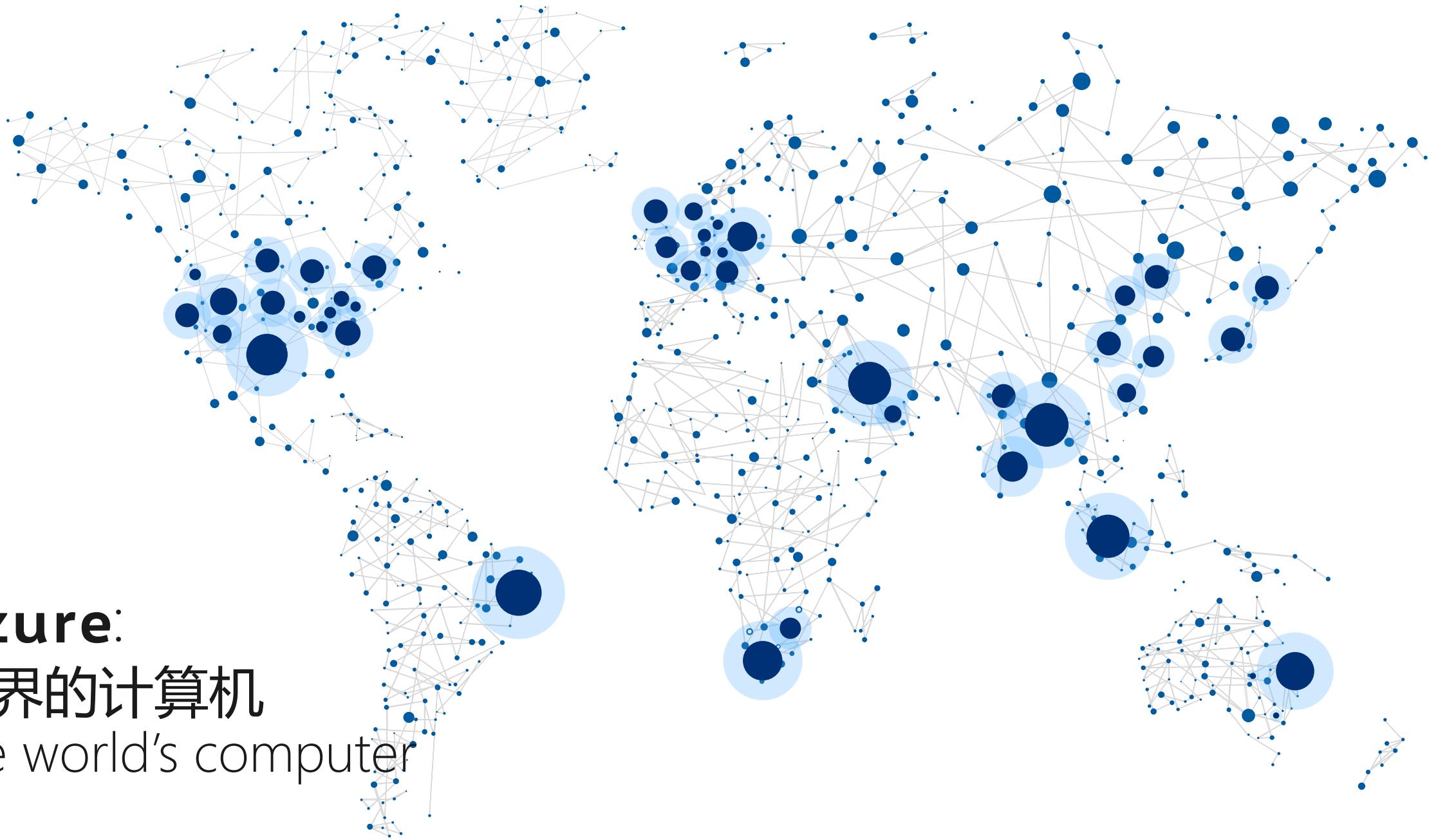


# 到 2020 年.....

Data by 2020...



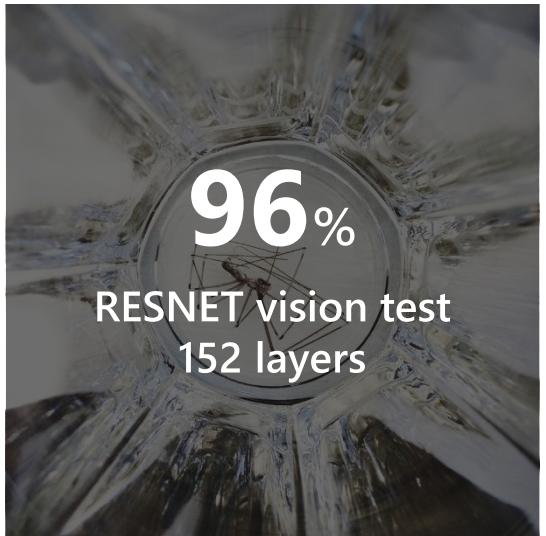
**Azure:**  
世界的计算机  
the world's computer



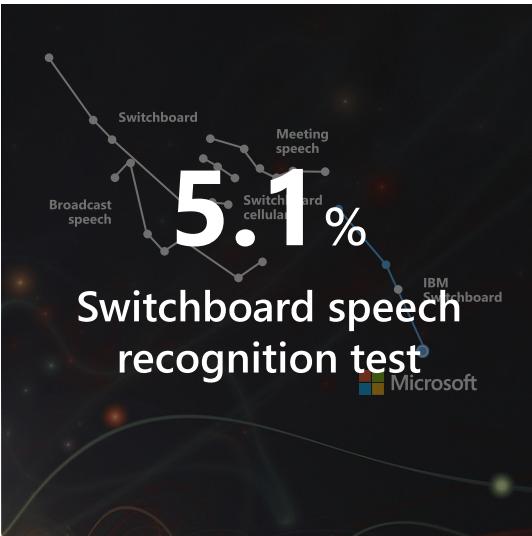
# 微软在人工智能领域的突破

Microsoft AI breakthroughs

视觉  
Vision



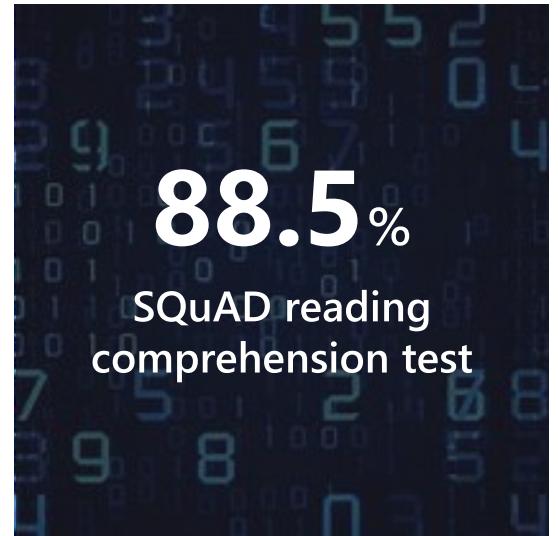
语音  
Speech



2016

Object recognition  
Human parity

语言  
Language



2017

Speech recognition  
Human parity

March 2018

Machine translation  
Human parity

January 2018

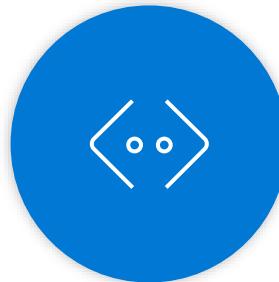
Machine reading comprehension  
Human parity

# 微软人工智能的 投入方向

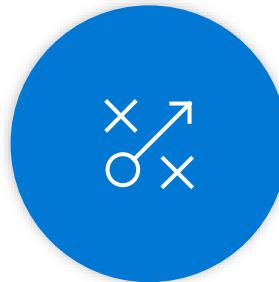
Microsoft AI  
investment areas



AI 平台 (AI platform)



AI 融入 (Infusing AI)

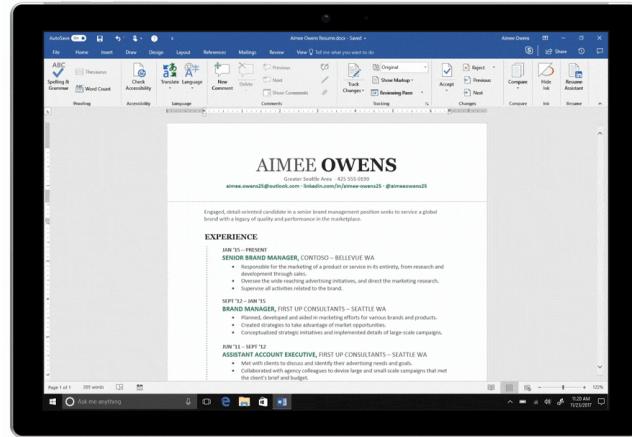


业务应用 (Business solutions)

# AI 融入 Infusing AI

人脸识别、小娜、电子墨水  
Facial recognition | Cortana | Inking

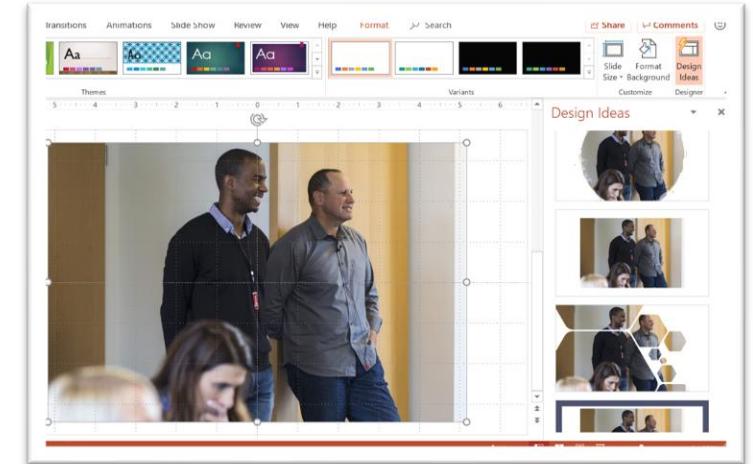
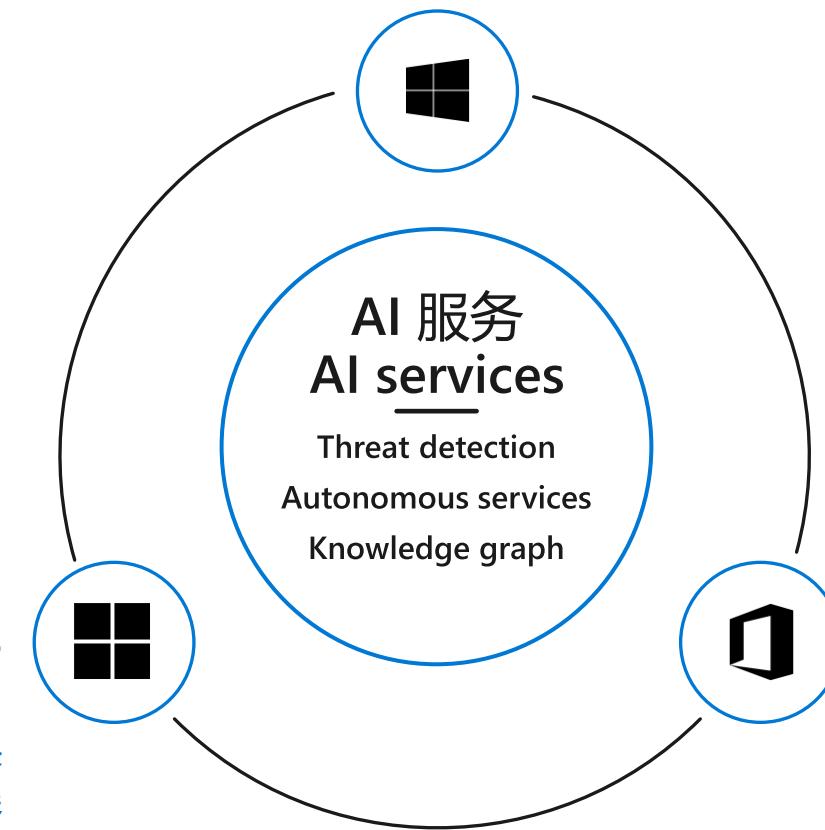
Windows



Visual Studio

深度学习框架  
AI模型管理、样例集

Deep learning frameworks |  
Manage AI models | Sample gallery



Office

设计师、变形切换  
简历助手、数据类型

Designer | Morph transition |  
Resume assistant | Data types

# Azure 认知服务

## Azure Cognitive Services



# The Microsoft AI platform

*Cloud-powered AI for every developer*

## Services

### CUSTOM AI

Azure Machine Learning

### PRE-BUILT AI

Cognitive Services

### CONVERSATIONAL AI

Bot Framework

## Tools

### CODING & MANAGEMENT TOOLS

VS Tools  
for AI

Azure ML  
Studio

Azure ML  
Workbench

Others (PyCharm, Jupyter Notebooks...)

## Infrastructure

### AI ON DATA

Cosmos  
DB

SQL  
DB

SQL  
DW

Data  
Lake

Spark

DSVM

### AI COMPUTE

Batch  
AI

ACS

Edge

CPU, FPGA, GPU

### DEEP LEARNING FRAMEWORKS

3rd Party

Cognitive  
Toolkit

TensorFlow

Caffe

Others (Scikit-learn, MXNet, Keras,  
Chainer, Gluon...)

### 三. 认知服务



# 为什么选择 Azure 认知服务？

## 简单

通过 REST API 自创  
易于添加：只需要  
几行代码



## 柔性

集成到所选的语言  
和平台  
在广泛的服务中找到适合你的  
应用的服务  
自带数据，打造  
自定义体验



## 经过考验

由来自 Microsoft Research、  
必应和 Azure 机器学习等  
领域的专家构建  
出色的文档、示例代码和社区  
支持



# 计算机视觉 – 人脸识别

## 人脸检测

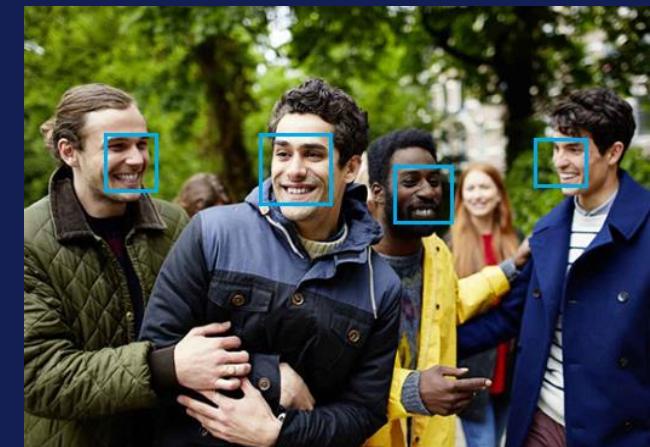
FaceAPI可以检测多达64个人脸，并在图像中进行高精度的人脸定位。图像可以由文件以字节或有效的URL指定。

## 人脸识别

人脸识别广泛应用于安全、自然用户界面、图像内容分析和管理、移动应用和机器人等领域。提供了四种人脸识别功能：人脸验证、相似人脸发现、人脸分组和身份识别。

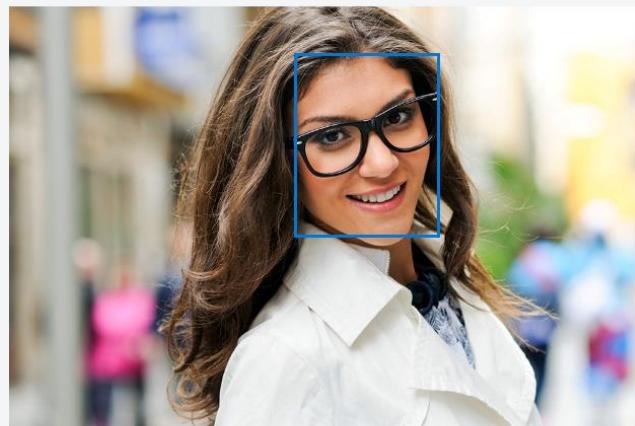
### 主要特点：

- 检测人脸并比较相似的人脸
- 基于相似度的图像分组
- 识别图像中先前标记的人



## 面部检测

检测一张或多张人脸并确定各种属性，例如年龄、表情、性别、姿势、笑容和面部毛发，包括图中每张脸上的 27 个特征点。



```
检测结果:  
detection_02  
JSON:  
[  
 {  
 "faceId": "d1459815-f362-4c24-80e9-a5ff00371e39",  
 "faceRectangle": {  
 "top": 76,  
 "left": 446,  
 "width": 226,  
 "height": 284  
 },  
 "faceAttributes": null,  
 "faceLandmarks": null  
 }  
 ]
```

图像 URL

提交

浏览

检测模型:

detection\_02



<https://azure.microsoft.com/zh-cn/services/cognitive-services/face/#demo>

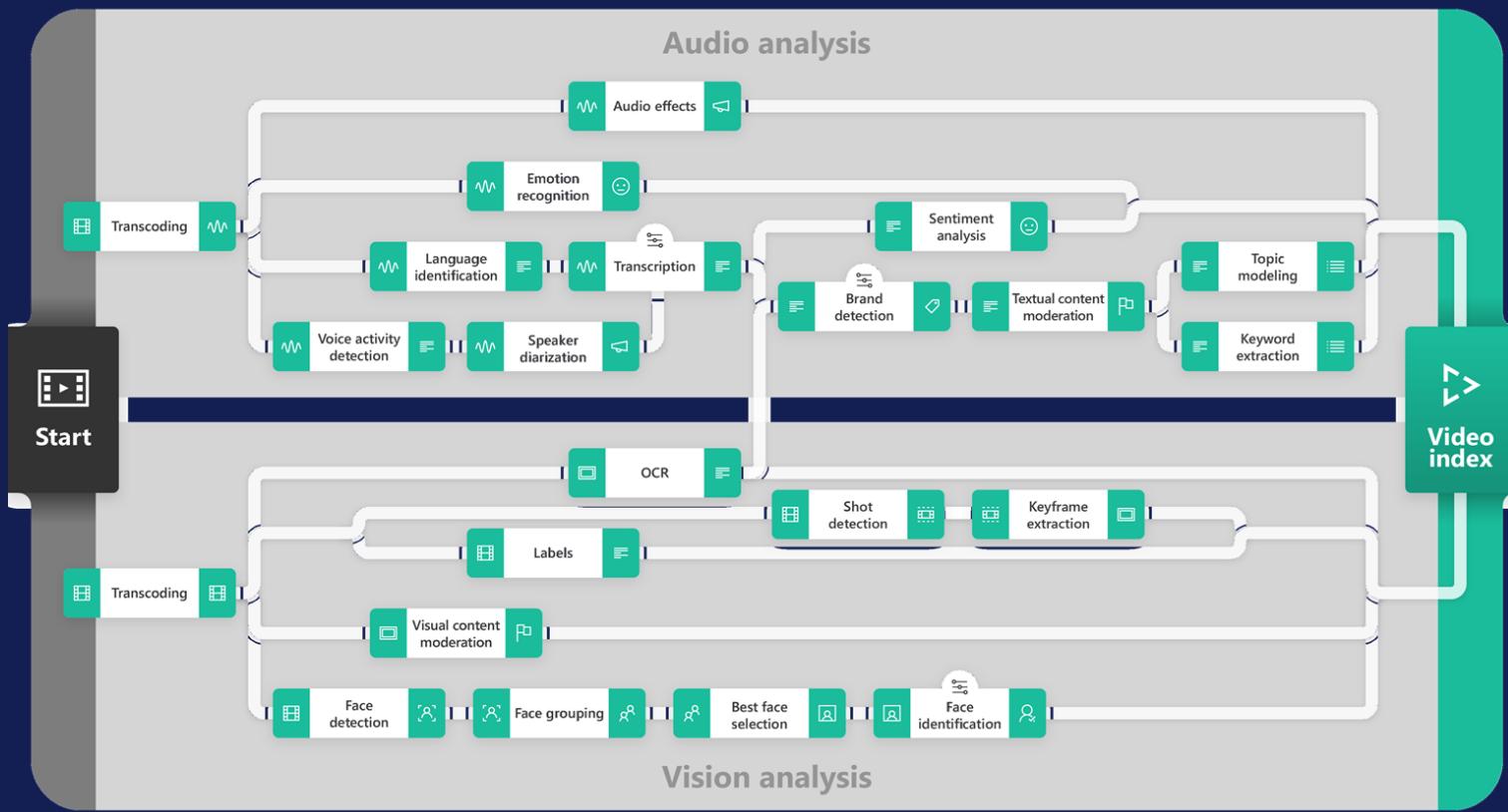
# 视频索引服务

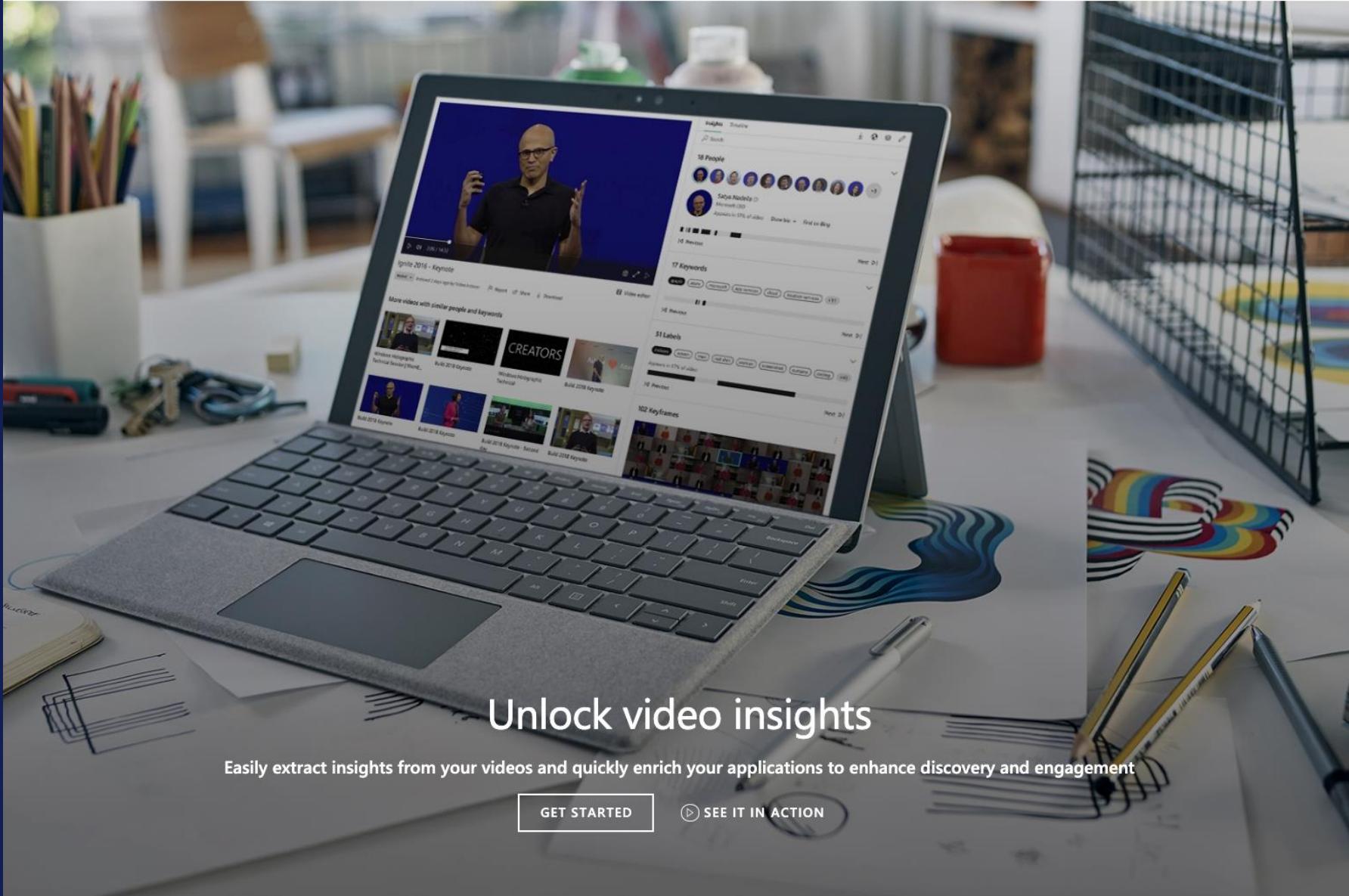
一站式解决方案，通过丰富的机器学习算法，从视频和音频文件中提取见解。提供服务和平台。



- ✓ 一体化解决方案-无需ML管道集成
- ✓ 通过多渠道渠道获得更多见解
- ✓ 免费评估，不需要编码技能
- ✓ 通过令人愉快的可嵌入小部件实现数据可视化
- ✓ 通过REST API轻松连接到现有的infra
- ✓ 根据您的特定数据需要进行自定义
- ✓ 轻松连接到Azure媒体服务以满足所有媒体需求

Try it today at <http://videoindexer.ai/>





## Unlock video insights

Easily extract insights from your videos and quickly enrich your applications to enhance discovery and engagement

GET STARTED

SEE IT IN ACTION

<https://vi.microsoft.com/en-us/>

# 语言理解能力

语言理解 (LUIS) 旨在成为最全面的基于云的会话理解服务，并且最容易为没有人工智能专业知识的开发人员使用：

从用户话语中提取意图/动作和实体

包括字典，可以用特定于客户的术语扩展

特点：

现在更容易与Azure Bot、Speech和QnA Maker服务集成



### **– Who are the target audience for the QnA Maker tool?**

QnA Maker is primarily meant to provide a FAQ data source which you can query from your Bot/Application. Although developers will find this useful, content owners will especially benefit from this tool. QnA Maker is a completely no-code way of managing the content that powers your Bot/Application.

### **– How do I login to the QnA Maker Portal?**

You can login with your Microsoft account.

### **– Is the QnA Maker Service free?**

Yes, currently the QnA Maker tool is free to use. However, we do meter the usage per account. See the Subscription Keys section of the documentation for details.

### **– My URLs have valid FAQ content, but the tool cannot extract them. Why not?**

It's possible that the tool is not able to auto-extract QnA from valid FAQ URLs. In such cases, you have an option to copy-paste the QnA content in a txt and try ingesting it. Alternately, you can always editorially add content to your knowledge base.

# Language Understanding (LUIS)

A machine learning-based service to build natural language into apps, bots, and IoT devices. Quickly create enterprise-ready, custom models that continuously improve.

Login / Sign up



## See Language Understanding in action

What the user says (utterances)

Book me a flight to Cairo

Order me 2 pizzas

Remind me to call my dad tomorrow

Where is the nearest club?



What LUIS returns

```
{  
  "query": "Book me a flight to Cairo",  
  "topScoringIntent": {  
    "intent": "BookFlight",  
    "score": 0.9887482  
  },  
  "intents": [  
    {  
      "intent": "BookFlight",  
      "score": 0.9887482  
    },  
    {  
      "intent": "None",  
      "score": 0.01125178  
    }  
  ]  
}
```

<https://www.luis.ai/home>

# 文本分析

从客户反馈和社交网络帖子中提取见解。

I had a wonderful trip to Seattle and enjoyed seeing the Space Needle!



**i LANGUAGES:**

English (confidence: 100 %)

**i KEY PHRASES:**

Seattle, wonderful trip, Space Needle

**i SENTIMENT:**

98 %

**i LINKED ENTITIES  
(PREVIEW):**

I had a wonderful trip to [Seattle](#) and enjoyed seeing  
[the Space Needle](#)!

# Text Analytics

Detect sentiment, key phrases, named entities and language from your text

[Try Text Analytics >](#)

Explore Text Analytics API: [Documentation](#) [API](#) [Pricing](#) [Portal](#) [Try Text Analytics API](#) [Stack Overflow](#)

## Extract information from your text. See it in action!

Use the demo below to experiment with the [Text Analytics API](#). Use our example or provide your own text in the input box below. Identify language, sentiment, key phrases, and entities (preview) in your text.

We went to Contoso Steakhouse located at midtown NYC last week for a dinner party, and we adore the spot! They provide marvelous food and they have a great menu. The chief cook happens to be the owner (I think his name is John Doe) and he is super nice, coming out of the kitchen and greeted us all. We enjoyed very much dining in the place! The Sirloin steak I ordered was tender and juicy, and the place was impeccably clean. You can even pre-order from their online menu at [www.contososteakhouse.com](http://www.contososteakhouse.com), call 312-555-0176 or send email to [order@contososteakhouse.com](mailto:order@contososteakhouse.com)! The only complaint I have is the food didn't come fast enough. Overall I highly recommend it!

Analyze

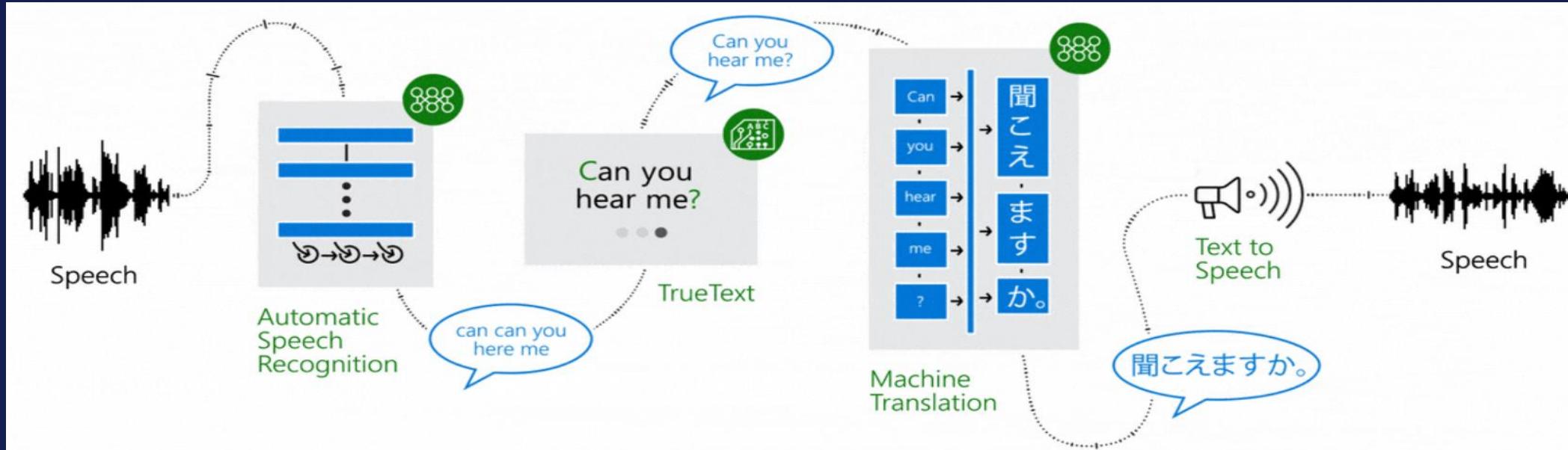


<https://azure.microsoft.com/en-us/services/cognitive-services/text-analytics/>

# 翻译

## 文本翻译— 翻译移动、桌面和web应用程序中的动态内容

- 自动检测语言
- 音译成不同的字母



超过60种语言支持: <https://docs.microsoft.com/en-us/azure/cognitive-services/Translator/language-support>

**Extend your application's reach**

Translate text in your mobile, desktop, and web applications to and from 60+ supported languages through the open REST interface of Translator API.

**Automatically detect languages**

Easily and accurately detect the language of any text string, simplifying development processes and allowing you to quickly send for translation or serve localized content.

**Transliterate into different alphabets**

Display text in different alphabets to make it easier to read — Translate from Chinese characters to PinYin, display any of the [supported transliteration languages](#) in the Latin alphabet, and even show words written in the Latin alphabet in non-Latin characters such as Japanese, Hindi or Arabic.

**Look up words with the bilingual dictionary**

Find alternative translations for words from or to English and examples of the words in context to help your app users choose the most appropriate translation. Provide context for alternate word translations by giving examples of human translated sentences using the word.

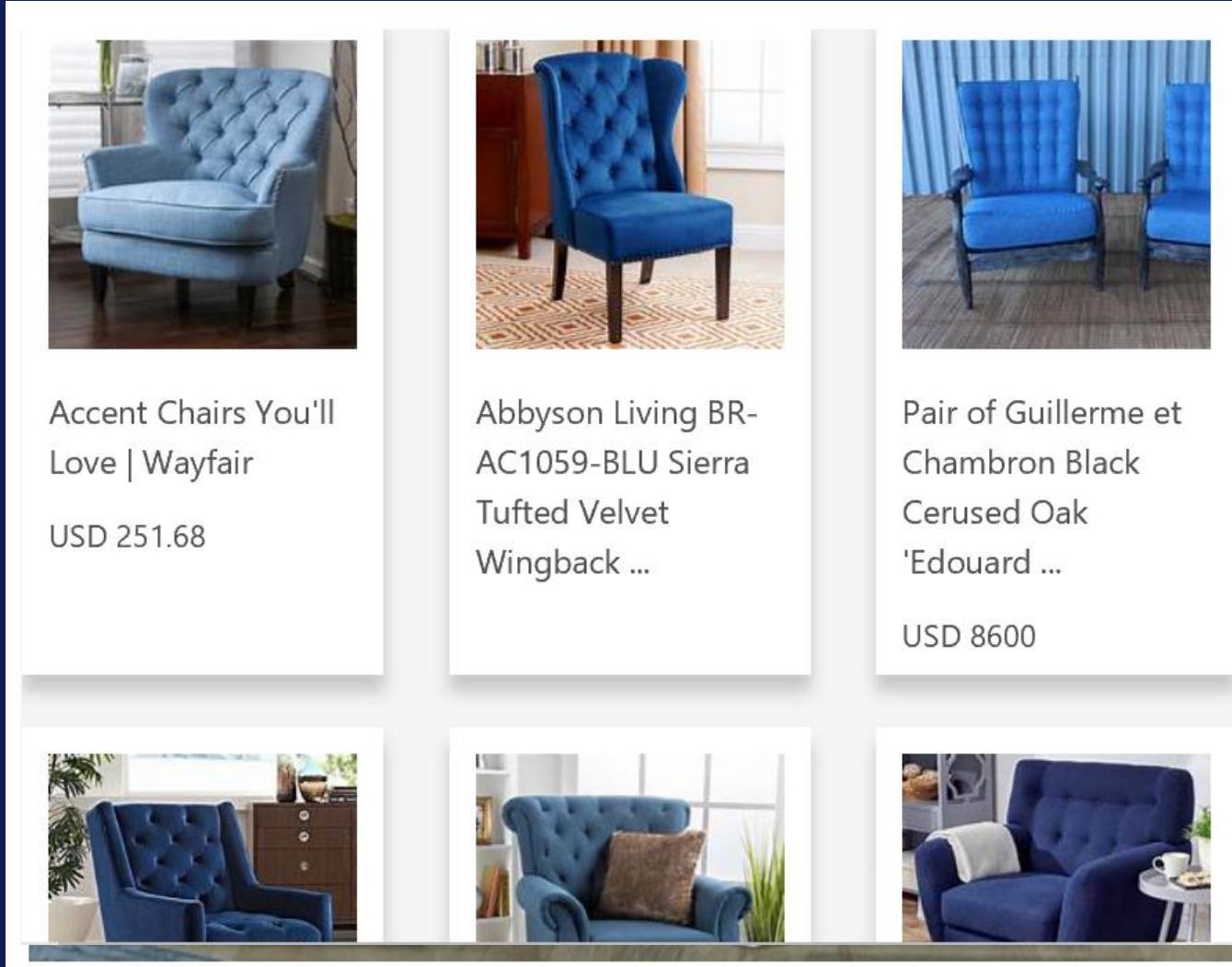
**Add online and offline translation support into your Android app**

With the Microsoft Translator [local feature](#), easily add on- and offline neural translation to your Android apps. Instead of calling the cloud API directly, perform a simple call to the Translator app to easily integrate text translation capabilities to your app. The app will then use the Translator cloud service when connected to the Internet or offline packs when disconnected, all using your existing Azure subscription for billing.

**Build customized translation systems**

Customize Microsoft Translator neural translation models to improve translation quality. Use your existing human-translated content to [build a custom translation system](#) that can better handle your writing style and industry expressions and vocabulary.

<https://azure.microsoft.com/en-us/services/cognitive-services/translator-text-api/>



Accent Chairs You'll Love | Wayfair

USD 251.68

Abbyson Living BR-AC1059-BLU Sierra Tufted Velvet Wingback ...

Pair of Guillerme et Chambron Black Cerused Oak 'Edouard ...

USD 8600

将Bing搜索API添加到您的应用程序中，并利用一个API调用就可以梳理数十亿个网页、图像、视频和新闻

集中搜索你选择的资源，  
创造令人信服的体验  
针对您的业务特定内容

## Get enhanced search details from billions of web documents

Retrieve web documents indexed by Bing Web Search API v7 and narrow down the results by result type, freshness and more. With API v7, discover improved query performance for your results. Try out the demo. Submit a query via the search box or click on one of the provided examples.

See it in action

Preview

JSON

Examples

burrito recipes

new movies

seattle seahawks

ted talks

weather today

Market

SafeSearch

Freshness

Burrito Recipes - Allrecipes.com

<https://www.allrecipes.com/recipes/1216>

Burrito Recipes Pick your filling and wrap it up! We have dozens of burrito recipes for you to choose from, including chicken, ground beef, black beans, and more.

10 Best Burrito Recipes | Allrecipes

<https://www.allrecipes.com/article/our-best-burrito-recipes>

Burritos are the best. They're quick, they're easy, they're a complete meal contained in a handy wrap. These top-rated burrito recipes are some of our very favorite Mexican and Tex-Mex recipes.

Burrito Recipes : Food Network | Food Network

<https://www.foodnetwork.com/topics/burrito-recipes>

Discover delicious and easy to prepare burrito recipes and ideas for burritos from the expert chefs at Food Network.

News about burrito recipes



This healthy, high-protein, vegan burrito recipe is about to become your new favorite easy dinner

Well+Good's co-founder Alexia Brue says this recipe is on repeat at her house because it's easy and everyone can customize their own burrito. (Read: It's definitely kid-friendly.) Just put the ingredients in different bowls and let everyone make their own burrito. Keep reading for the full recipe. 1. In a high-speed blender or food ...

<https://azure.microsoft.com/en-us/services/cognitive-services/bing-web-search-api/>

## Use AI to solve business problems



### Vision

Image-processing algorithms to smartly identify, caption, index, and moderate your pictures and videos.



### Knowledge

Map complex information and data in order to solve tasks such as intelligent recommendations and semantic search.



### Language

Allow your apps to process natural language with pre-built scripts, evaluate sentiment and learn how to recognize what users want.



### Speech

Convert spoken audio into text, use voice for verification, or add speaker recognition to your app.



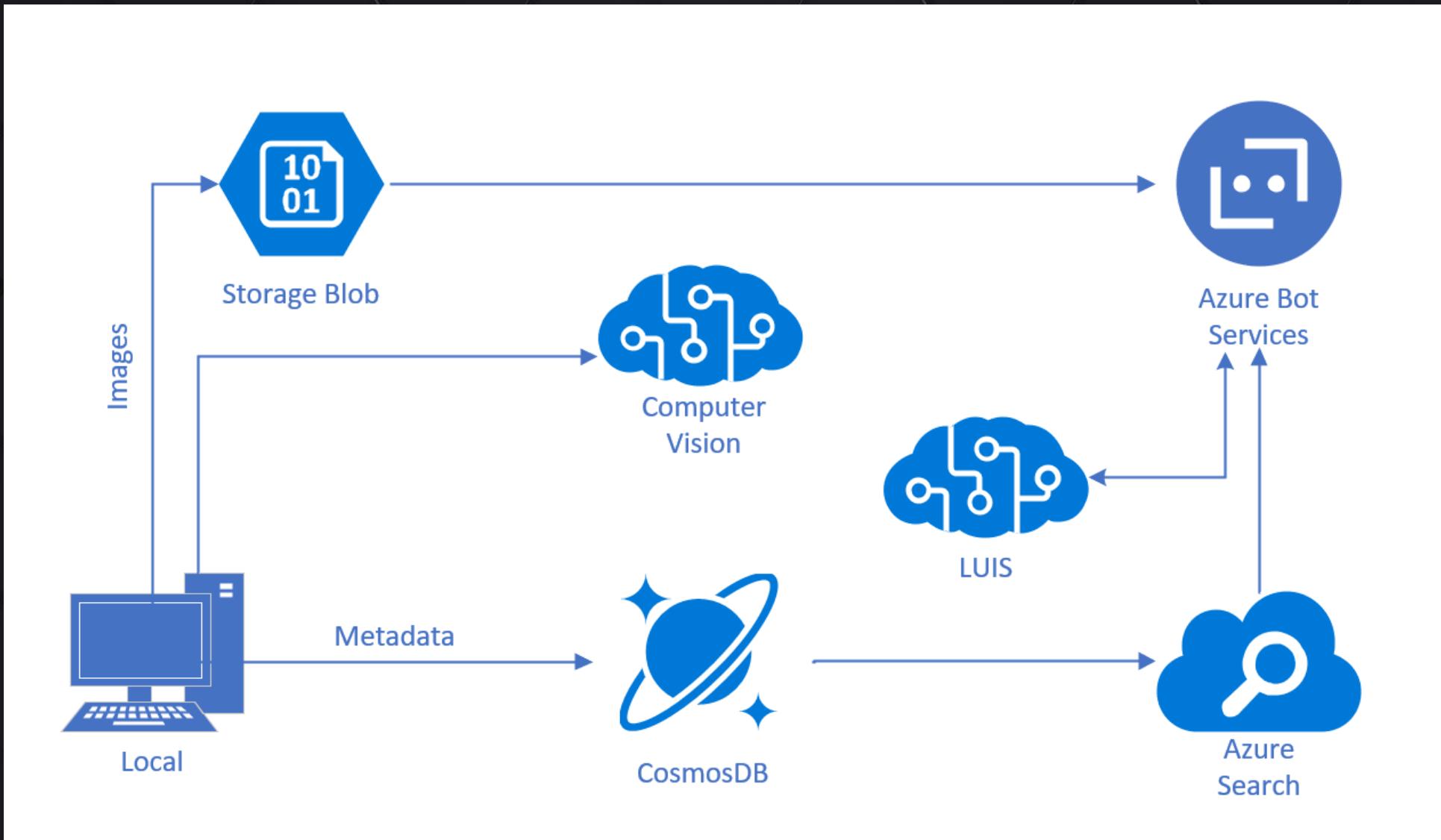
### Search

Add Bing Search APIs to your apps and harness the ability to comb billions of webpages, images, videos, and news with a single API call.



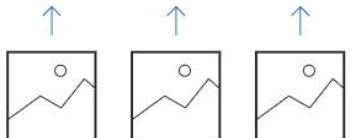
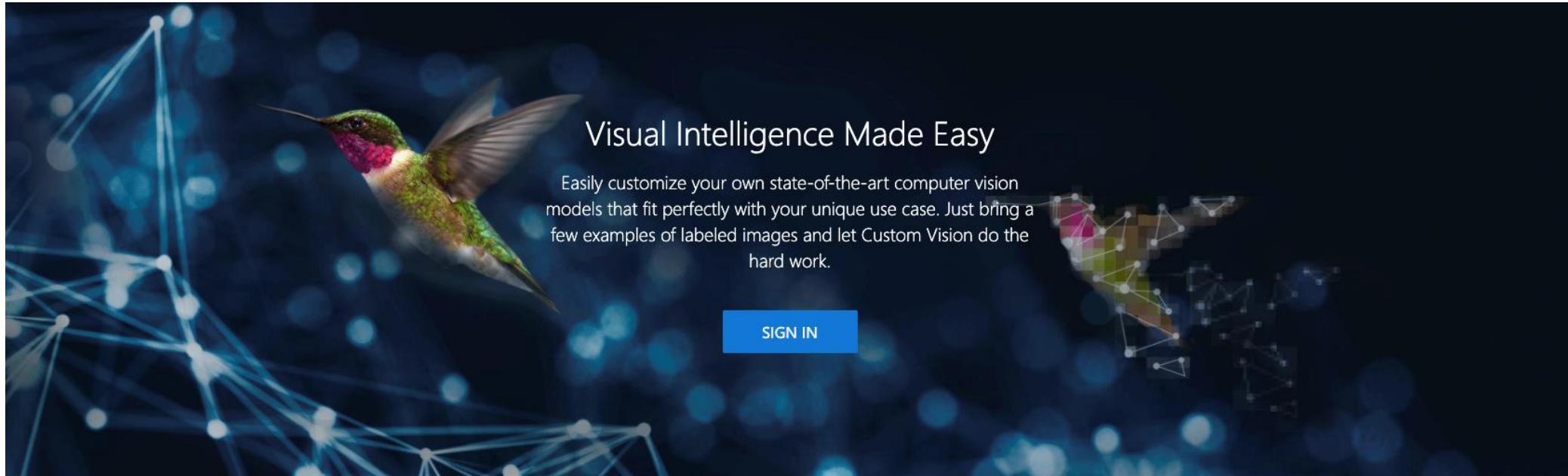
### Anomaly Detection

Add anomaly detection capabilities to your apps to identify problems as soon as they occur.



# Custom Vision

## 低代码的解决方案



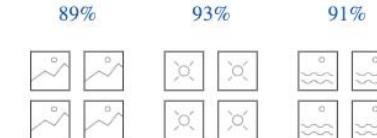
### Upload Images

Bring your own labeled images, or use Custom Vision to quickly add tags to any unlabeled images.



### Train

Use your labeled images to teach Custom Vision the concepts you care about.



### Evaluate

Use simple REST API calls to quickly tag images with your new custom computer vision model.

# Custom Vision

## 低代码的解决方案

Quick Test

X

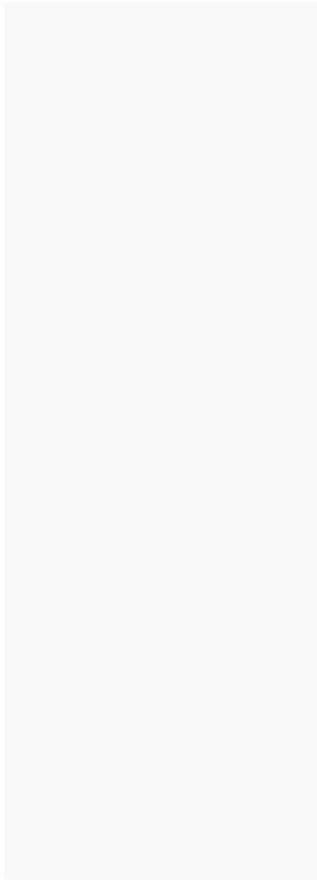


Image URL

Enter Image URL



or

Browse local files

File formats accepted: jpg, png, bmp

File size should not exceed: 4mb

Using model trained in

Iteration

Iteration 1

Predictions

| Tag  | Probability |
|------|-------------|
| bb8  | 99.9%       |
| r2d2 | 0%          |
| c3po | 0%          |

# Custom Vision

## 低代码的解决方案

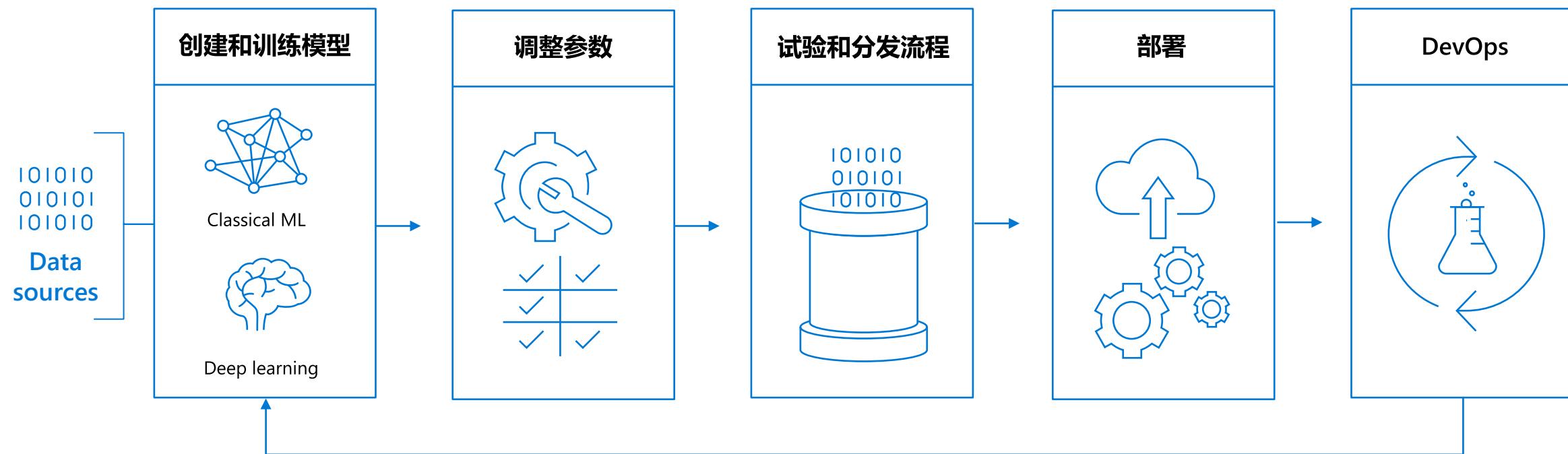
The screenshot shows the Custom Vision web interface for Iteration 1. At the top, there are configuration sliders for Probability Threshold (50%) and Overlap Threshold (30%). Below this, a summary card for Iteration 1 states: "Trained on: 3/23/2020 with General (compact) domain". The main area displays performance metrics: Precision (93.3%), Recall, and mAP. A modal dialog titled "Choose your platform" lists five deployment options:

- iOS (CoreML, iOS 11)
- TF (TensorFlow, Android)
- ONNX (Windows ML)
- DF (Dockerfile, Azure IoT Edge, Azure Functions, AzureML)
- VADIK (Vision AI Dev Kit)

# 四. Azure Machine Learning



# 构建AI项目的步骤





# Azure Machine Learning service

是一个提升生产力的AI开发平台



Boost your data science productivity



Increase your rate of experimentation



Deploy and manage your models everywhere



Built with your needs in mind

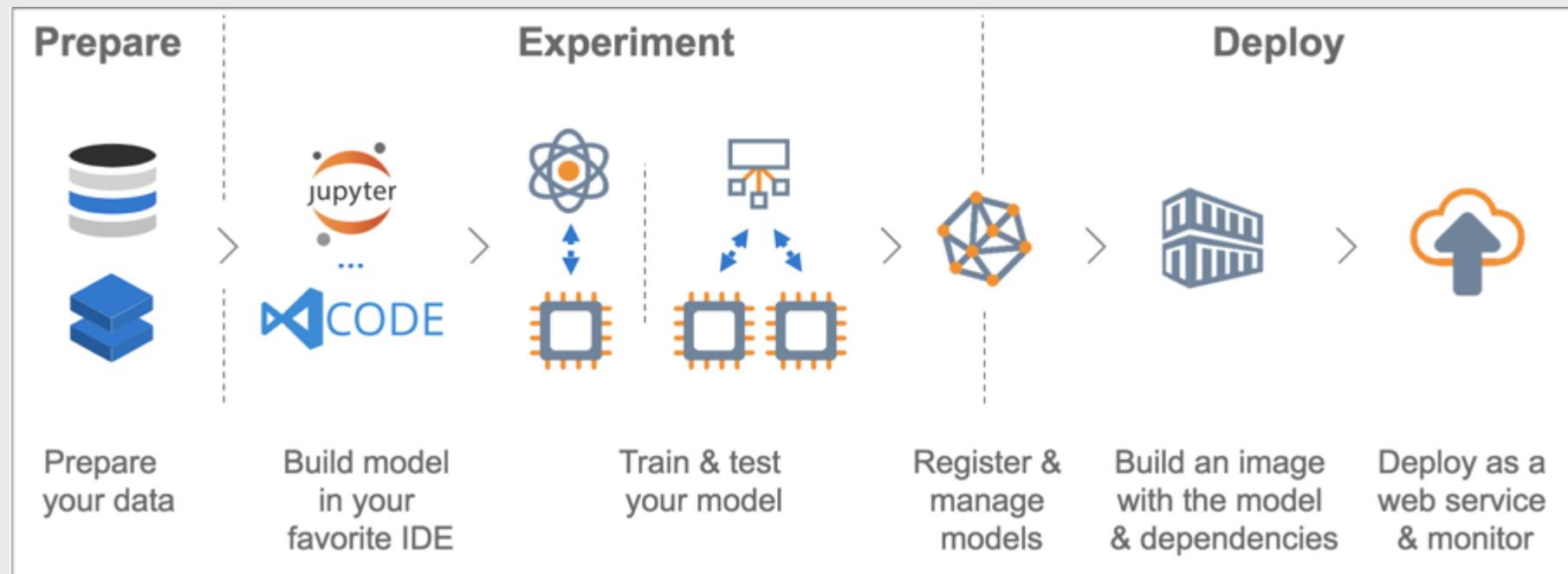
- Automated machine learning
- Managed compute
- Simple deployment
- DevOps for machine learning
- Support for open source frameworks
- Tool agnostic Python SDK



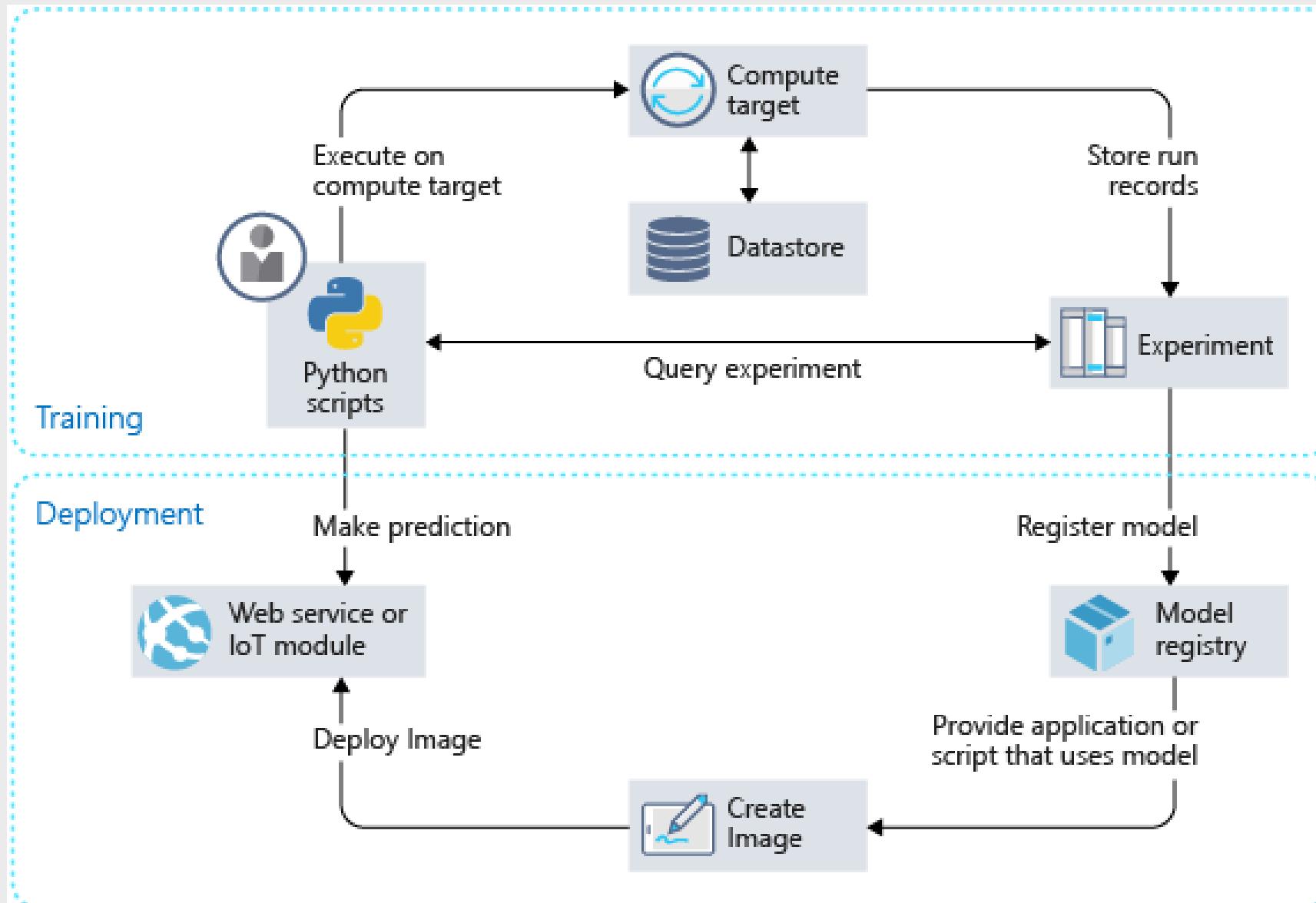
Seamlessly integrated with the Azure Portfolio

# Azure Machine Learning Service

Azure Machine Learning service provides a cloud-based environment you can use to prep data, train, test, deploy, manage, and track machine learning models.



# Azure Machine Learning Service



# 强而有力的硬件设备

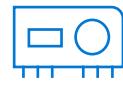
为深度学习加速



## CPUs

General purpose machine learning

D, F, L, M, H Series



## GPUs

Deep learning

N Series



## FPGAs

Specialized hardware accelerated deep learning

Project Brainwave

Optimized for flexibility

Optimized for performance



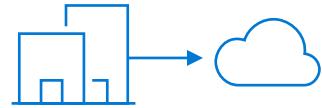
### FPGA NEW UPDATES:

Support for image classification and recognition scenarios  
ResNet 50, ResNet 152, VGG-16, SSD-VGG, DenseNet-121

# 集成多场景的Python SDK



Use your favorite IDEs, editors, notebooks,  
and frameworks



Flexibility of your local environment or  
curated cloud environment

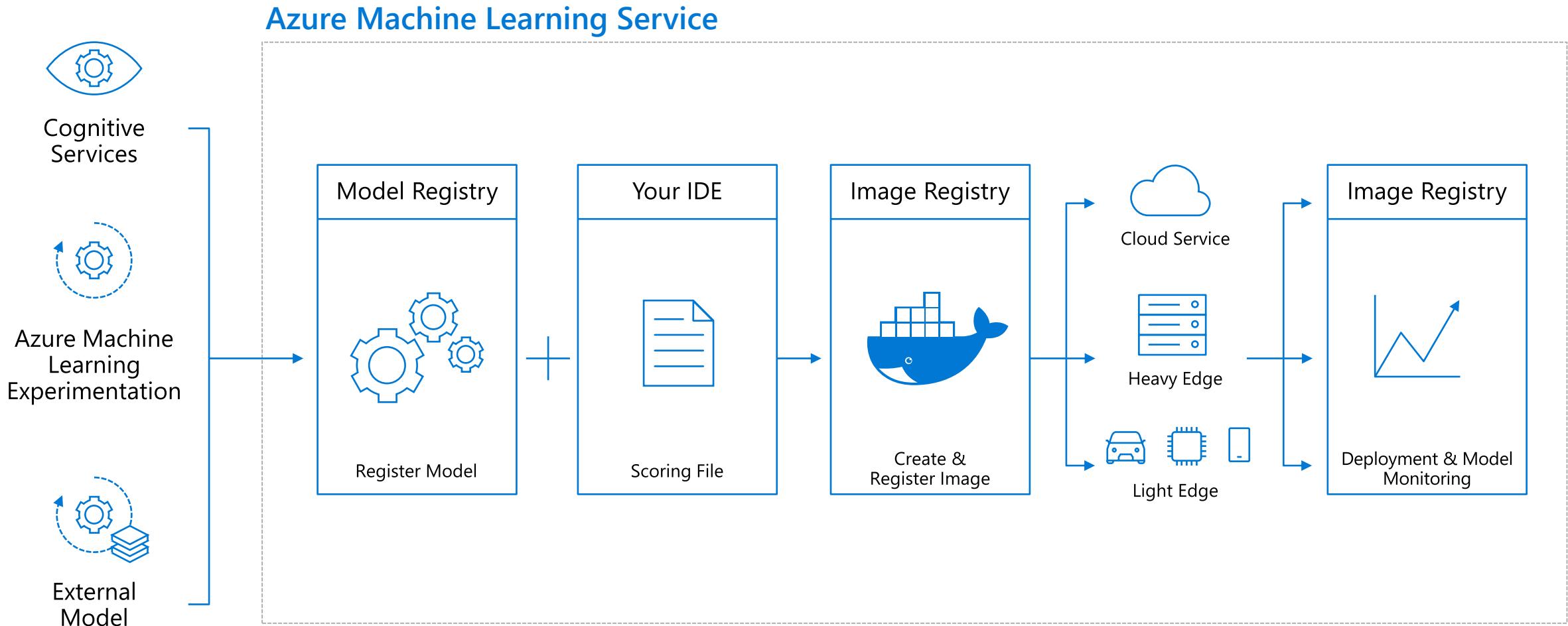


Integrate with other services like  
Azure Databricks



Get started quickly without any complex  
pre-requisites

# Deploy Azure ML models at scale



# 五. AutoML



# Automated Machine Learning

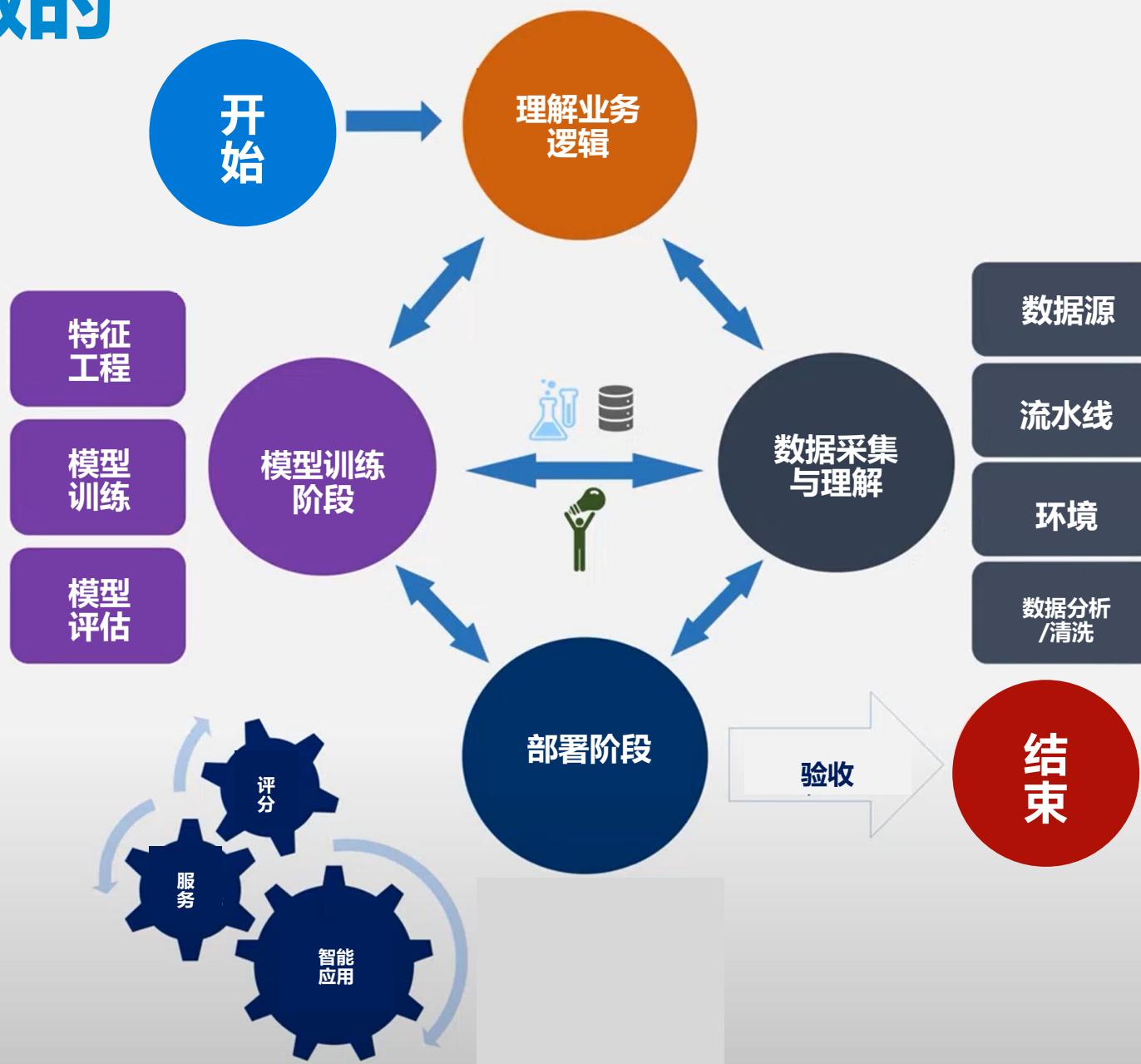
**Automated machine learning(自动化机器学习 )** 是自动化机器学习模型开发的耗时、迭代任务的过程

各行各业的数据科学家、分析师和开发人员可以使用AutoML完成：

1. 在没有广泛编程知识的情况下实施机器学习解决方案
2. 节省时间和资源
3. 利用数据科学最佳实践
4. 提供敏捷的问题解决

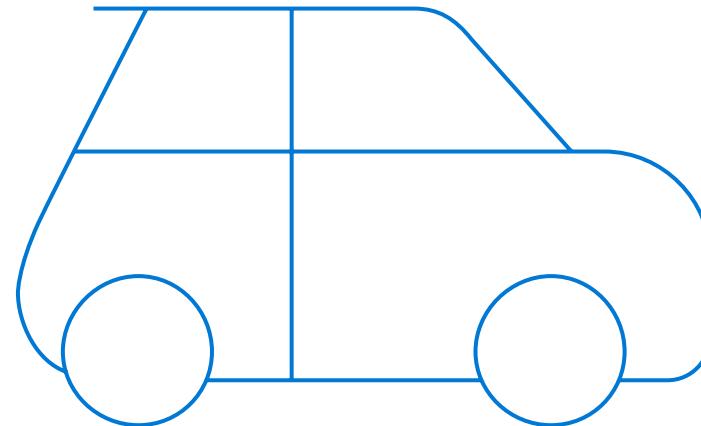
# 数据科学要做的

## 数据科学的一些工作



# Azure Machine Learning

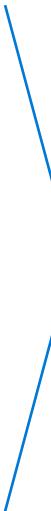
Automated machine learning



估算一台车的价格?

# 模型创建相当费时

|              | Which features?     | Which algorithm?   | Which parameters?   |  |
|--------------|---------------------|--------------------|---|--|
| Mileage      | Gradient Boosted    | Parameter 1        |  |  |
| Condition    | Nearest Neighbors   | Parameter 2        |  |  |
| Car brand    | SVM                 | Main Samples Split |  |  |
| Year of make | Bayesian Regression | Main Samples Leaf  |  |  |
| Regulations  | LGBM                | Others             |  |  |
| ...          | ...                 |                    |   |  |



30%

Model

# 模型创建相当费时

Which features?

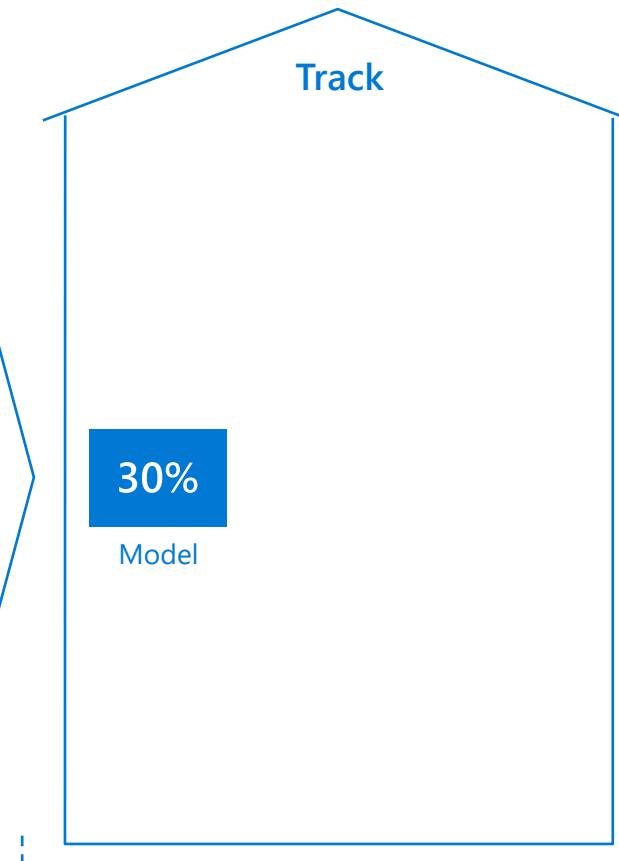
|              |
|--------------|
| Mileage      |
| Condition    |
| Car brand    |
| Year of make |
| Regulations  |
| ...          |

Which algorithm?

|                     |
|---------------------|
| Gradient Boosted    |
| Nearest Neighbors   |
| SGD                 |
| Bayesian Regression |
| LGBM                |
| ...                 |

Which parameters?

|                   |
|-------------------|
| Neighbors         |
| Weights           |
| Min Samples Split |
| Min Samples Leaf  |
| ZYX               |



Iterate

# 模型创建相当费时

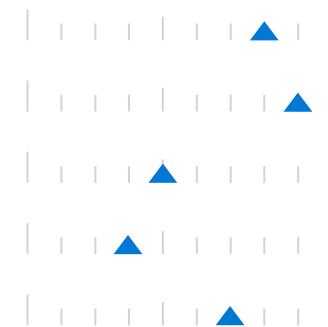
Which features?



Which algorithm?



Which parameters?



Iterate

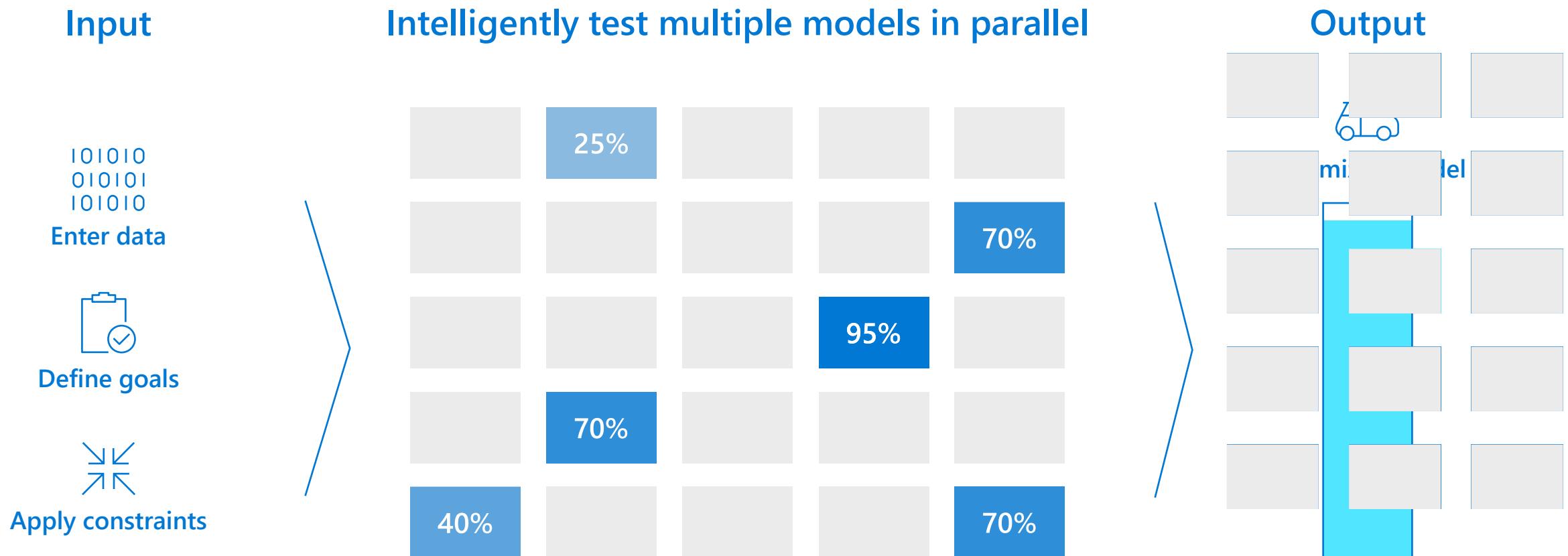
Track

30%

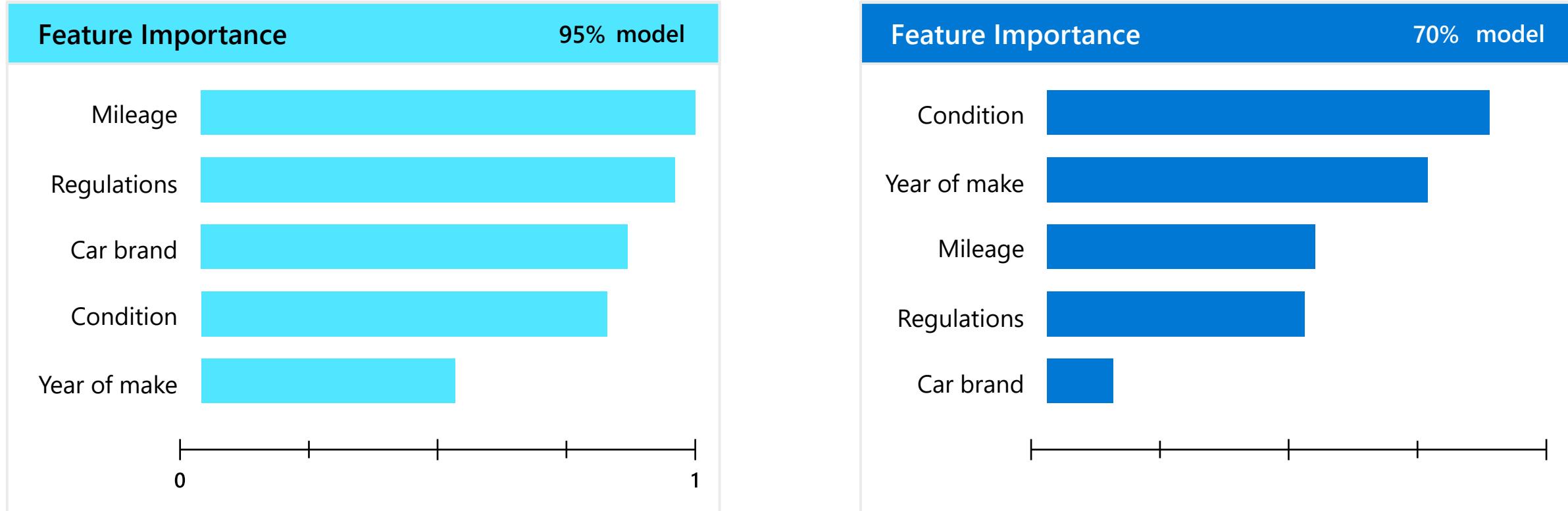
15%



# Automated Machine Learning 加速模型训练



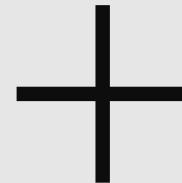
# Understand the inner workings of ML by analyzing feature importance



不是单一的迭代创建模型，而且可以针对每次训练的模型进行分析，让你更快速找到最佳模型

# Azure Machine Learning service

Azure Cloud  
Services



Python  
SDK

---

帮助你完成:

- ✓ 数据准备
- ✓ 编译模型
- ✓ 训练模型

- ✓ 管理模型
- ✓ 跟踪训练
- ✓ 部署模型

# 六. 小结

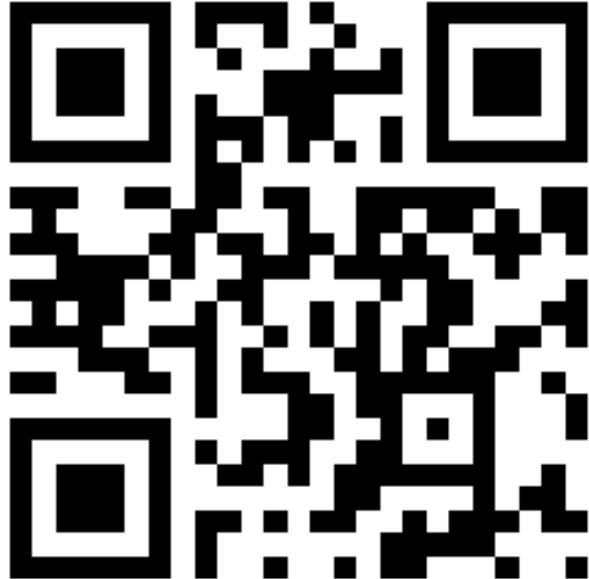


# MSLearn学习模块



利用 Azure 认知服务  
创建计算机视觉解决方案

<https://aka.ms/cv01>



通过 Azure 机器学习  
使用可视化工具创建机器学习模型

<https://aka.ms/azueml01>



通过 Azure 机器学习  
构建和运行机器学习解决方案

<https://aka.ms/azueml02>



# Reactor

## Thank You!