



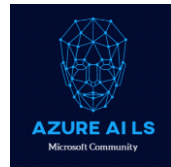
COLEGIO DE INGENIEROS DEL PERU
CONSEJO DEPARTAMENTAL DE ICA
CAPITULO DE INDUSTRIAL Y SISTEMAS

Aplicando Inteligencia Artificial con Microsoft



Pablo Angel Piovano

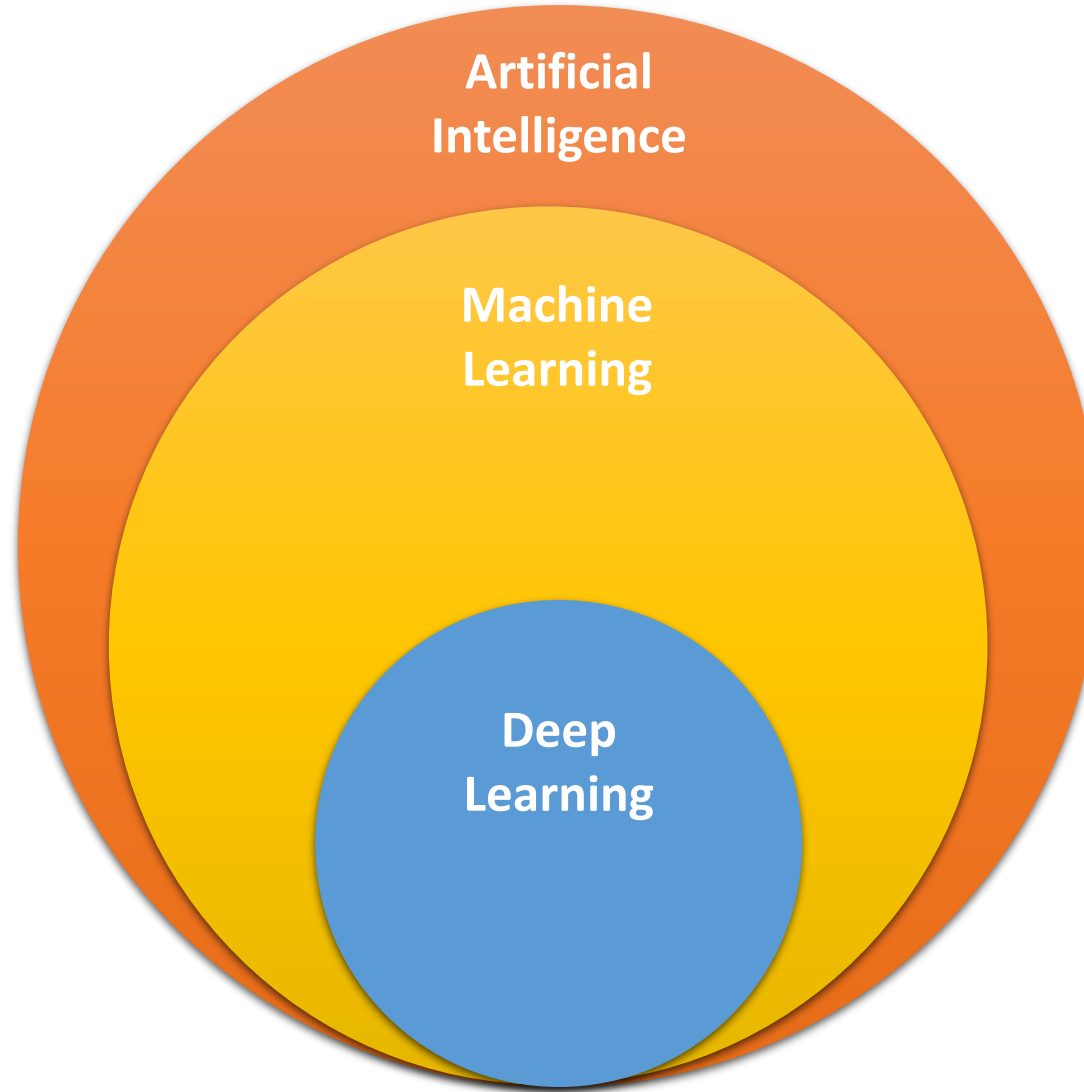
- Ingeniero en Computación, con más de 12 años de experiencia en el sector TI.
- Enfocado en desarrollar e implementar soluciones con tecnologías Microsoft
- Participo activamente como organizador en la comunidad **Microsoft Azure AI Latam South.**



Agenda

- Conceptos AI, ML y DL
- Cargas de trabajo comunes de la AI
- Tipos de Machine Learning
- Diferentes escenarios de ML
- Microsoft AI Ecosystem
- Microsoft Azure Cognitive Services
- ML.NET

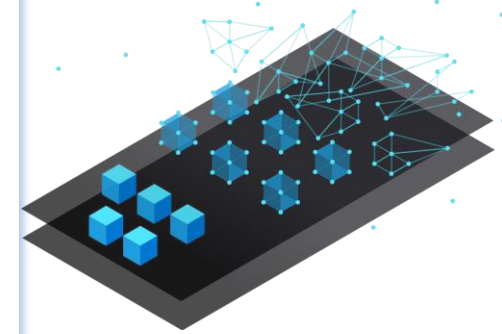
AI + ML + Deep learning



Cargas de trabajo comunes de la IA



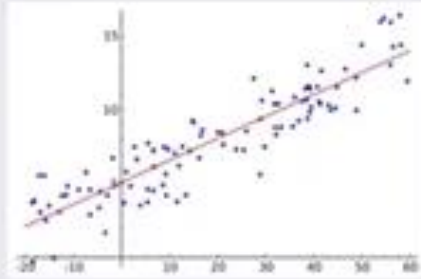
	Aprendizaje automático	Modelos predictivos basados en datos y estadísticas: la base de la IA
	Detección de anomalías	Sistemas que detectan patrones o eventos inusuales, lo que permite una acción preventiva
	Computer Vision	Aplicaciones que interpretan la entrada visual de cámaras, imágenes o vídeos.
	Procesamiento del lenguaje natural	Aplicaciones que pueden interpretar el lenguaje escrito o hablado
	IA conversacional	Agentes de IA (o <i>bots</i>) que pueden entablar diálogos con usuarios humanos



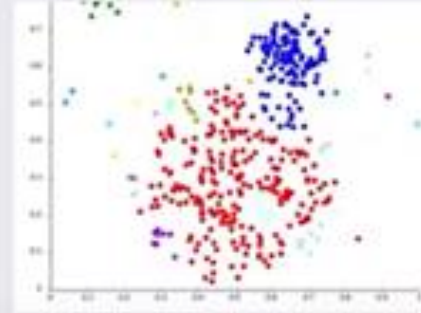
Diferentes escenarios de ML



Classification



Regression



Clustering



Recommendation

SUPERVISADOS

NO SUPERVISADOS

Ecosistema de IA de Microsoft



Cognitive Services



AzureML



ML.NET



Administrado

Personalizado



Microsoft Cognitive Services



Fácil

REST APIs

Simple de añadir: solo unas cuantas líneas de código



Flexible

Se integra en el lenguaje y la plataforma de su elección.

La amplitud de ofertas le ayuda a encontrar la API correcta para su aplicación

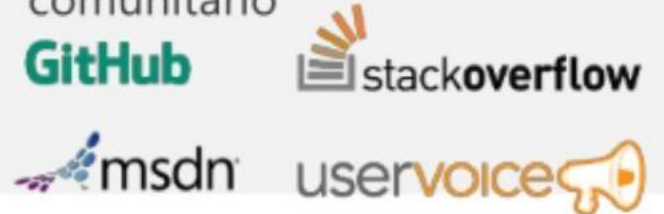
Traiga sus propios datos para su experiencia personalizada



Probado

Construido por expertos en su campo de Microsoft Research, Bing y Azure Machine Learning

Documentación de calidad, código de muestra y soporte comunitario



Link: Crear Recurso en Azure



Categorías



Visión

- **Computer Vision**
- **Custom Vision**
- **Face**
- Form Recognizer



Voz

- Speech to Text
- Text to Speech
- Speech Translation
- Speaker Recognition



Idioma

- LUIS
- Question answering
- Sentiment analysis
- Translator



Decisión

- Anomaly Detector
- Content Moderator
- Personalizer



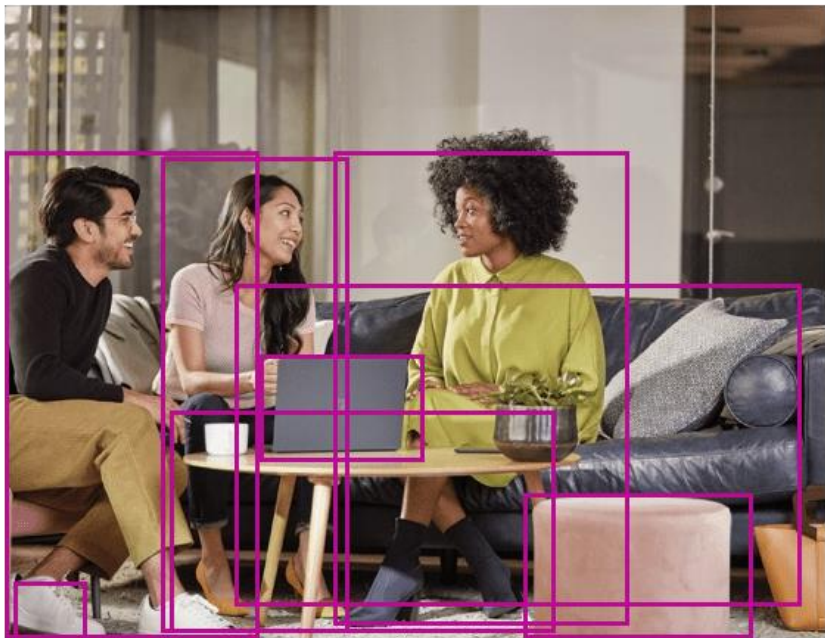
Búsqueda

- [Bing Web Search](#)
- [Bing Image Search](#)
- [Bing Entity Search](#)
- [Bing News Search](#)
- [Bing Video Search](#)
- [Bing Autosuggest](#)
- [Bing Spell Check](#)
- [Bing Local Business Search](#)
- [Bing Custom Search](#)



Computer Vision

Véala en acción

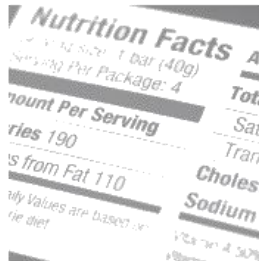
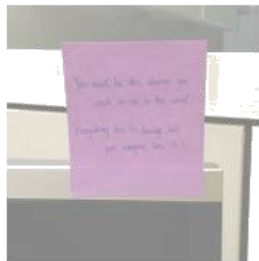
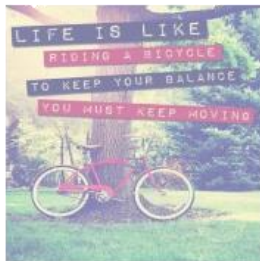


NOMBRE DE LA CARACTERÍSTICA:

VALOR

Objetos

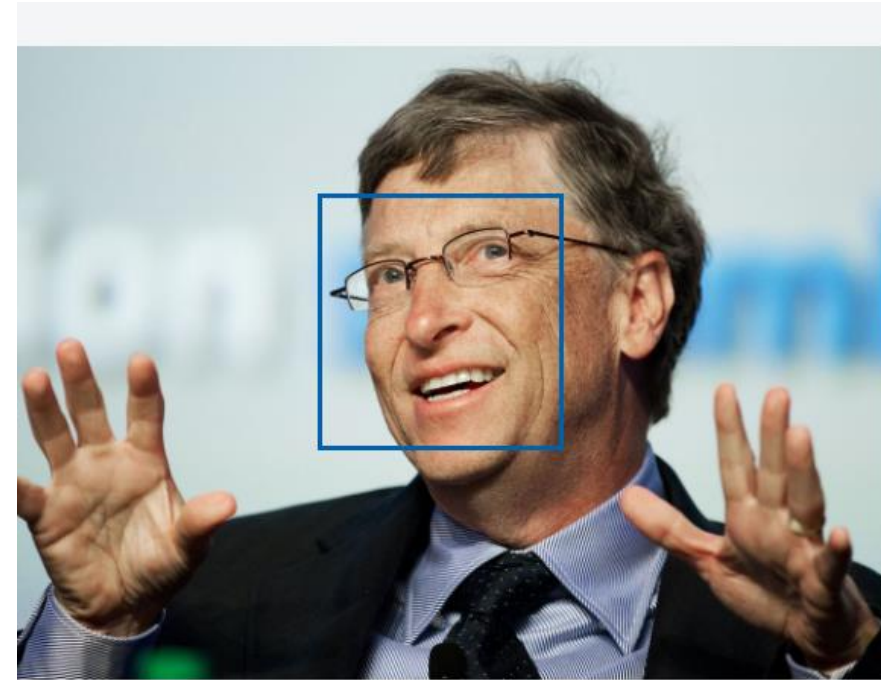
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[ { "rectangle": { "x": 6, "y": 390, "w": 48, "h": 40 }, "object": "footwear", "confidence": 0.513 }, { "rectangle": { "x": 104, "y": 104, "w": 127, "h": 323 }, "object": "person", "confidence": 0.763 }, { "rectangle": { "x": 174, "y": 236, "w": 113, "h": 74 }, "object": "Laptop", "parent": { "object": "computer", "confidence": 0.56 }, "confidence": 0.553 }, { "rectangle": { "x": 351, "y": 331, "w": 154, "h": 99 }, "object": "seating", "confidence": 0.525 }, { "rectangle": { "x": 0, "y": 101, "w": 174, "h": 329 }, "object": "person", "confidence": 0.855 }, { "rectangle": { "x": 223, "y": 99, "w": 199, "h": 322 }, "object": "person", "confidence": 0.725 }, { "rectangle": { "x": 154, "y": 191, "w": 387, "h": 218 }, "object": "seating", "confidence": 0.679 }, { "rectangle": { "x": 111, "y": 275, "w": 264, "h": 151 }, "object": "table", "confidence": 0.601 } ]
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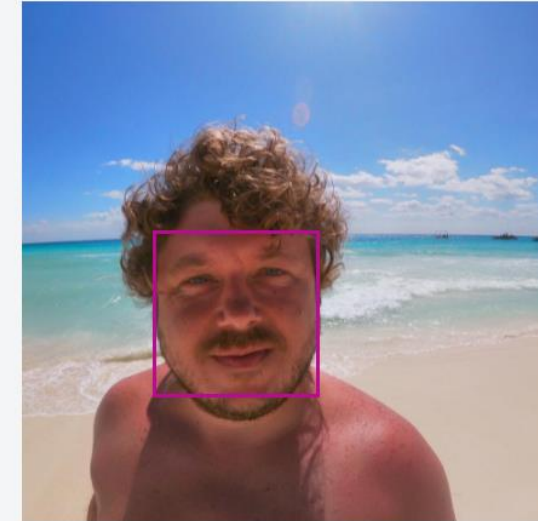
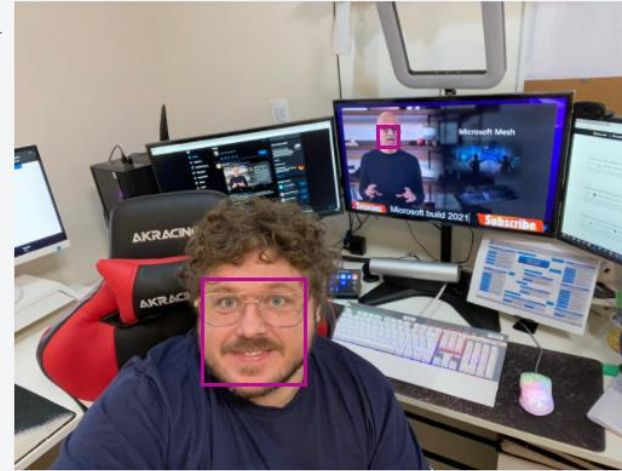
[Link: Ejemplo Consola C#](#)



Face Api



```
Resultado de la detección:  
1 caras detectadas  
  
JSON:  
[  
  {  
    "faceRectangle": {  
      "top": 187,  
      "left": 482,  
      "width": 316,  
      "height": 316  
    },  
    "faceAttributes": {  
      "emotion": {  
        "anger": 0.0,  
        "contempt": 0.0,  
        "disgust": 0.0,  
        "fear": 0.0,  
        "happiness": 1.0,  
        "neutral": 0.0,  
        "sadness": 0.0,  
        "surprise": 0.0  
      }  
    }  
  }  
]
```



URL de la imagen

Enviar

Examinar

URL de la imagen

Enviar

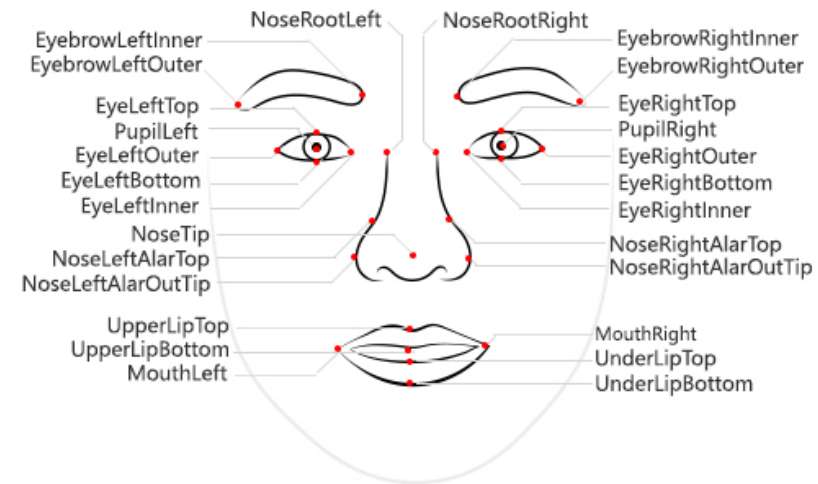
Examinar

Resultado de la comprobación: las dos caras pertenecen a la misma persona. La confianza es 0.91385.

[Link: API's Documentation](#)

[Link: Crear Recurso Face Api en Azure](#)

[Link: Ejemplo para detectar Masks en las caras](#)



Microsoft Azure

Home > Resource groups > DemoAI > Create a resource >

Custom Vision

Microsoft

Custom Vision

Microsoft

★★★★☆ 4.3 (44 ratings)

Create

Add to Favorites

Prediction Resource

Select pricing and location for Prediction Resource

Prediction location *

(US) East US

Prediction pricing tier (Learn More) * ⓘ

Free F0 (2 Transactions per second, 10K Transactions per month)

Standard S0 (10 Transactions per second)

Microsoft Azure

Search resources, services, and docs (G+ /)

Home > Resource groups > DemoAI > Create a resource > Custom Vision >

Create

Custom Vision All In One

optimize manufacturing processes, accelerate digital marketing campaigns -- and more. No machine learning expertise is required. [Learn more](#)

Create options

BothTrainingPrediction

Project details

Select the subscription to manage deployed resources and costs. Use resource groups like folders to organize and manage all your resources.

Subscription * ⓘ

Pay-As-You-Go

Resource group * ⓘ

DemoAI

Create new

Name * ⓘ

XamDemo

Training Resource

Select pricing and location for Training Resource

Training location *

(US) East US

Training pricing tier (Learn More) * ⓘ

Free F0 (2 Transactions per second, 2 Projects)

Standard S0 (10 Transactions per second)

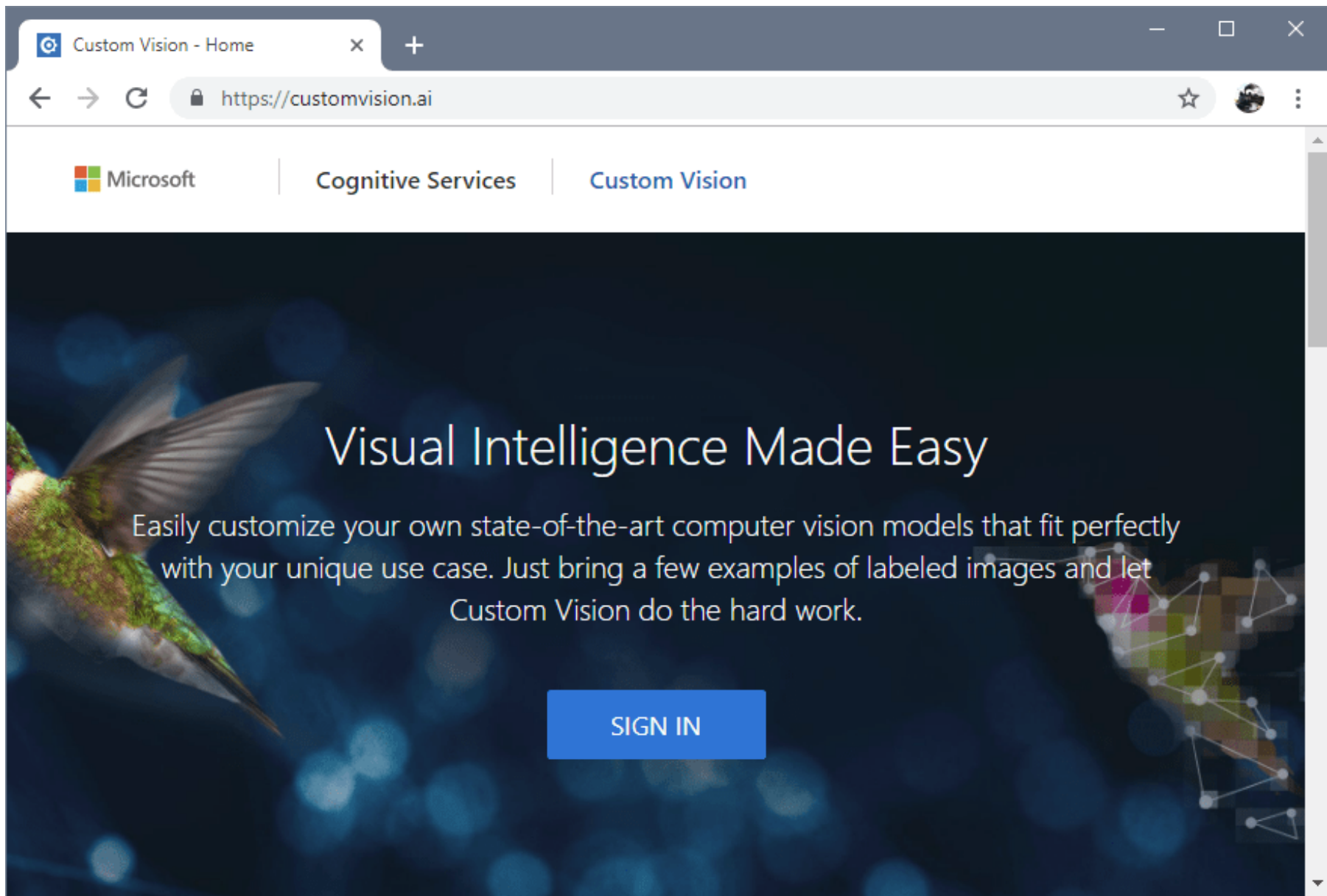
Prediction Resource

Select pricing and location for Prediction Resource

Prediction location *

(US) East US

Prediction pricing tier (Learn More) * ⓘ



Create new project



Name*

Enter project name

Description

Enter project description

Resource

[create new](#)

[Manage Resource Permissions](#)

Project Types ⓘ

- ☒ Classification
- ☐ Object Detection

Classification Types ⓘ

- ☐ Multilabel (Multiple tags per image)
- ☒ Multiclass (Single tag per image)

Domains:

- ☒ General [A2]
- ☐ General [A1]
- ☐ General
- ☐ Food
- ☐ Landmarks
- ☐ Retail
- ☐ General (compact) [S1]
- ☐ General (compact)
- ☐ Food (compact)
- ☐ Landmarks (compact)
- ☐ Retail (compact)

Pick the domain closest to your scenario. Compact domains are lightweight models that can be exported to iOS/Android and other platforms. [Learn More](#)



Fruit

Training Images

Performance

Predictions



Train



Quick Test



Filter

Iteration

Workspace



Tags



Tagged

Untagged

Showing: all tagged images

Search for



Add images

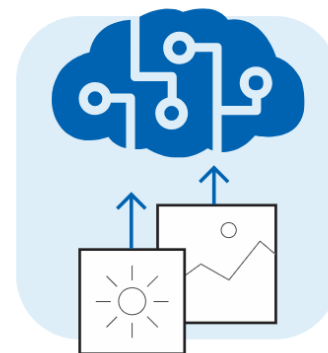


Delete



Tag images

Select all



Looks like you don't have any images here!

Go ahead and browse for images to upload to your project, tag them, and they will be ready to be trained.

Add images

.JPG, .PNG, .BMP format, up to 6 MB per image





Filter

Iteration

Workspace

Tags

Tagged

Untagged

Showing: all tagged images

Search For Tags:

☐ Cell 30☐ Goku 32☐ Goku Super Saiyan 28☐ Krilin 32☐ Piccolo 28☐ Super Buu 28☐ Vegeta 31

Add images

Delete

Tag images

Select all

< 1 2 3 4 >



Get started

Choose Training Type



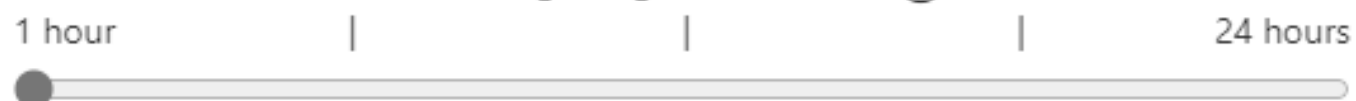
Training Types ⓘ

☐ Quick Training

☒ Advanced Training

In most cases, the more time you select the better the model will be. You're charged based on the compute time used to train your model, so choose your budget based on your need.

Training budget: 1 hour ⓘ



☐ Send me an email notification after training completes

Email address

ppiova@hotmail.com

Train

Iterations

Probability Threshold: 50%

Iteration 4 PUBLISHED

Advanced Trained : 21 hours ago with General (compact) domain,
Training Budget: 2 hours

Iteration 3

Trained : 23 hours ago with General (compact) domain

Iteration 2

Trained : 23 hours ago with General (compact) domain

Iteration 1

Trained : 1 days ago with General (compact) domain

Unpublish

Prediction URL

Delete

Export

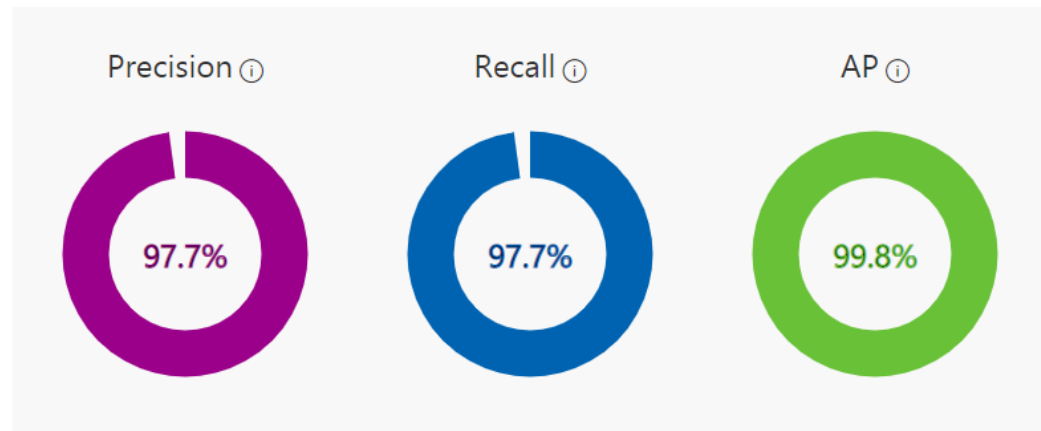
Iteration 4

Finished training on **6/1/2021, 8:57:42 PM** using **General (compact)** domain

Iteration id: **29086a4a-2a31-45c2-a097-bcf1bc9cd9a3**

Classification type: **Multiclass (Single tag per image)**


Published as: **Iteration4**



Performance Per Tag

Tag	Precision	Recall	A.P.	Image count
Vegeta	100.0%	100.0%	100.0%	31
Super Buu	100.0%	100.0%	100.0%	28
Piccolo	100.0%	100.0%	100.0%	28
Goku Super Saiyan	100.0%	83.3%	100.0%	28

Iterations

Probability Threshold: 50% 



Iteration 4

PUBLISHED

Advanced Trained : 21 hours ago
with General (compact) domain,
Training Budget: 2 hours

Iteration 3

Trained : 23 hours ago with General
(compact) domain

Iteration 2

Trained : 23 hours ago with General
(compact) domain

Iteration 1


Trained : 1 days ago with General
(compact) domain

Training Images









Performance

Predictions

 Train

 Quick Test

Performance Per Tag

Tag	Precision 	Recall	A.P.	Image count
Vegeta	100.0%	100.0%	100.0%	31 
Super Buu	100.0%	100.0%	100.0%	28 
Piccolo	100.0%	100.0%	100.0%	28 
Goku Super Saiyan	100.0%	83.3%	100.0%	28 
Goku	100.0%	100.0%	100.0%	32 
Cell	100.0%	100.0%	100.0%	30 
Krillin	87.5%	100.0%	98.2%	32 

Quick Test



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

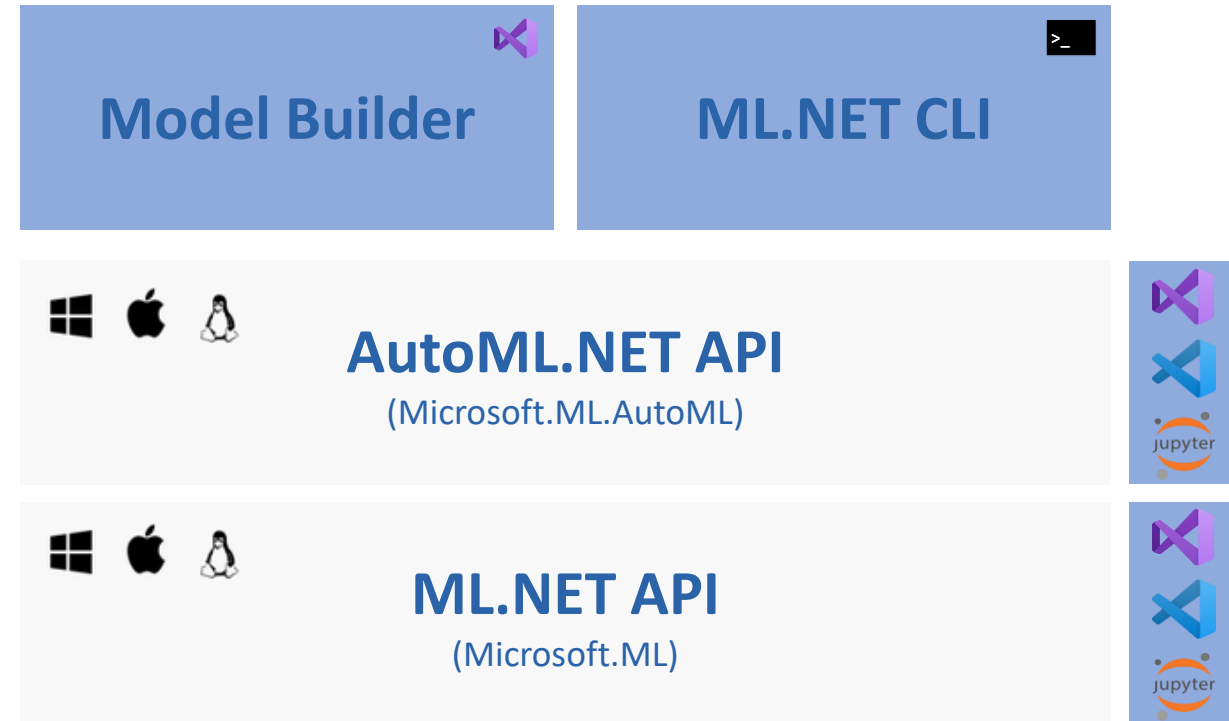
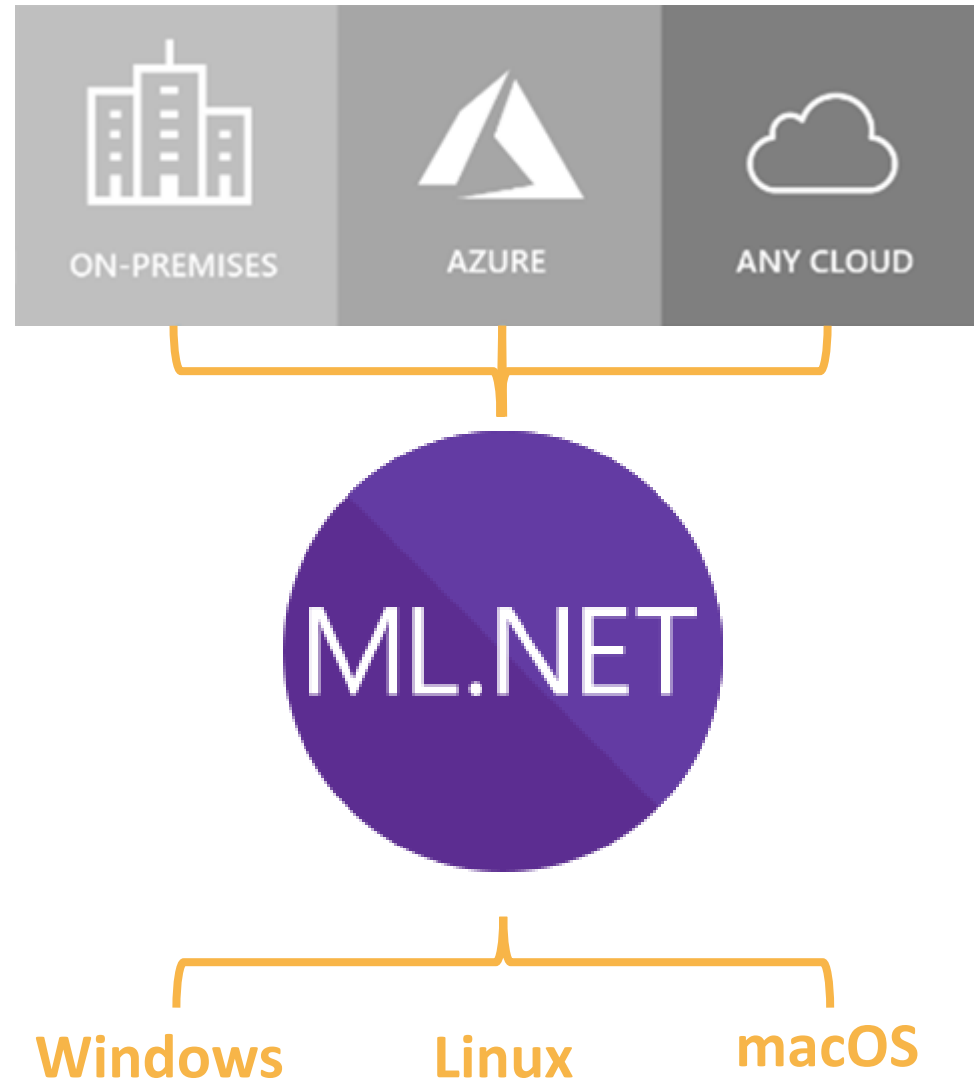
Iteration

Iteration 4

Predictions

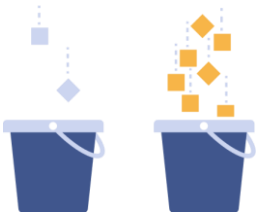
Tag	Probability
Piccolo	100%
Cell	0%
Goku Super Saiyan	0%
Super Buu	0%
Goku	0%

ML.NET



Tareas de ML.NET Soportadas

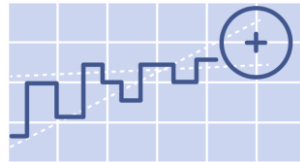
Clasificación



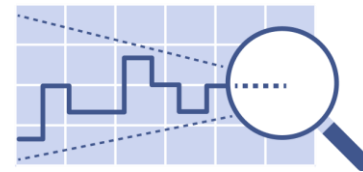
Regresión



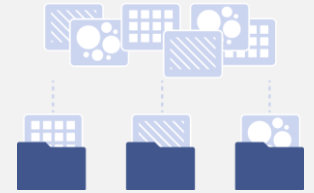
Predicción



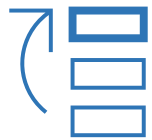
Detección de anomalías



Clasificación de imágenes



Ranking



Clustering



Recomendaciones




Detección de objetos




Instalación ML.NET


Modifying — Visual Studio Community 2019 — 16.10.4


Workloads Individual components Language packs Installation locations


**Game development with Unity** ☒
Create 2D and 3D games with Unity, a powerful cross-platform development environment.


**Game development with C++** ☐
Use the full power of C++ to build professional games powered by DirectX, Unreal, or Cocos2d.


Other Toolsets (6)


**Data storage and processing** ☐
Connect, develop, and test data solutions with SQL Server, Azure Data Lake, or Hadoop.

**Data science and analytical applications** ☐
Languages and tooling for creating data science applications, including Python and F#.

**Visual Studio extension development** ☐
Create add-ons and extensions for Visual Studio, including new commands, code analyzers and tool windows.

**Office/SharePoint development** ☐
Create Office and SharePoint add-ins, SharePoint solutions, and VSTO add-ins using C#, VB, and JavaScript.

**Linux development with C++** ☐
Create and debug applications running in a Linux environment.

**.NET cross-platform development** ☒
Build cross-platform applications using .NET, ASP.NET Core, HTML/JavaScript, and Containers including Docker...


Installation details

- Mobile development with .NET
 - Game development with Unity
- .NET cross-platform development
 - Included
 - .NET development tools
 - .NET Framework 4.7.2 development tools
 - ASP.NET and web development tools prer...
 - Optional
 - Cloud tools for web development
 - .NET profiling tools
 - Developer Analytics tools
 - Web Deploy
 - Live Share
 - ML.NET Model Builder (Preview)**
 - .NET Debugging with WSL 2
 - IntelliCode
 - MSIX Packaging Tools
 - .NET Core 2.1 Runtime (LTS)
- Individual components

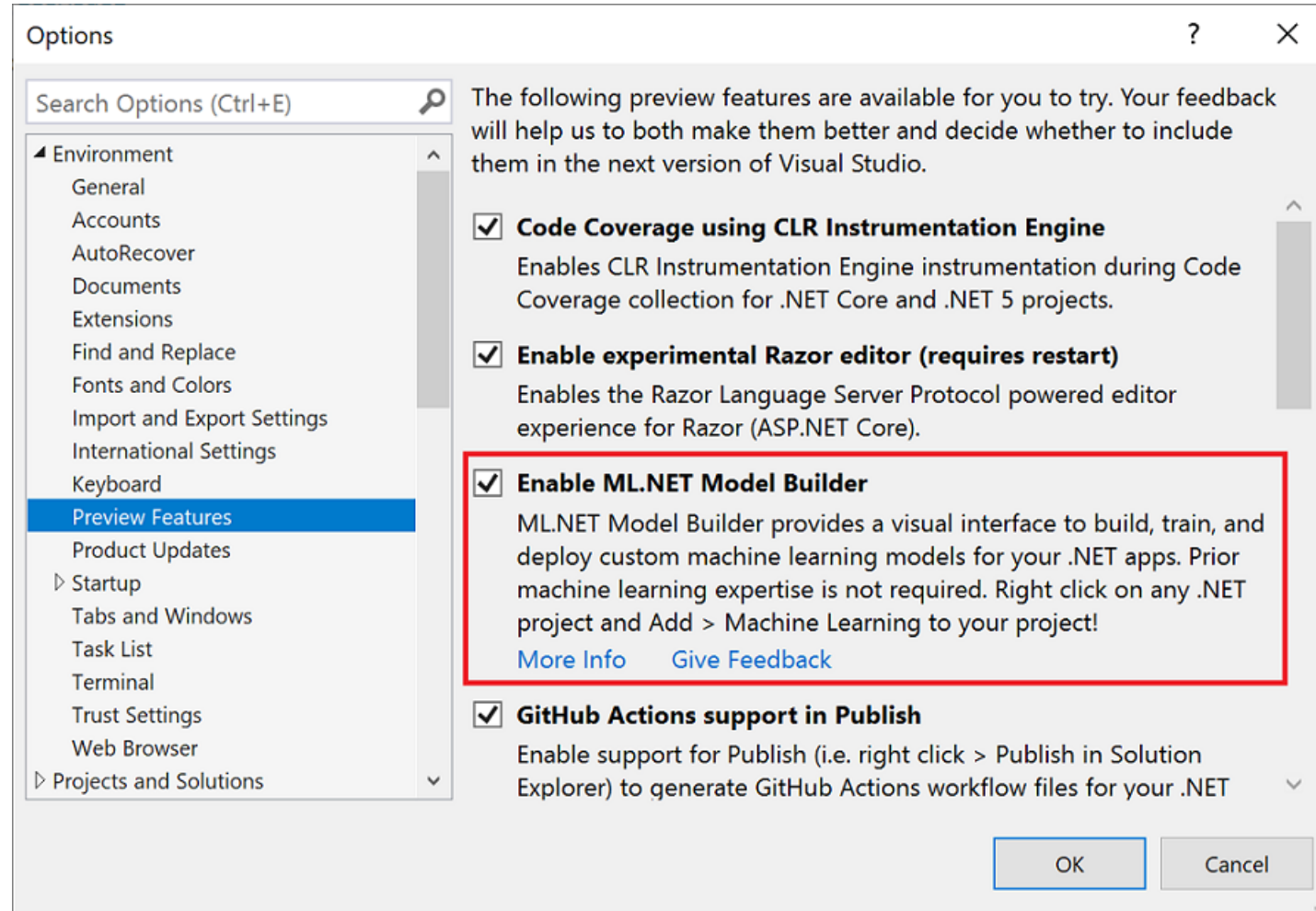
Location
C:\Program Files (x86)\Microsoft Visual Studio\2019\Community

By continuing, you agree to the [license](#) for the Visual Studio edition you selected. We also offer the ability to download other software with Visual Studio. This software is licensed separately, as set out in the [3rd Party Notices](#) or in its accompanying license. By continuing, you also agree to those licenses.

Total space required 616 MB

Install while downloading  Modify

Habilitar ML.NET en Visual Studio





Dataset Categories



Computer Science

[VIEW DATASETS >](#)



Social Science

[VIEW DATASETS >](#)



Physics

[VIEW DATASETS >](#)

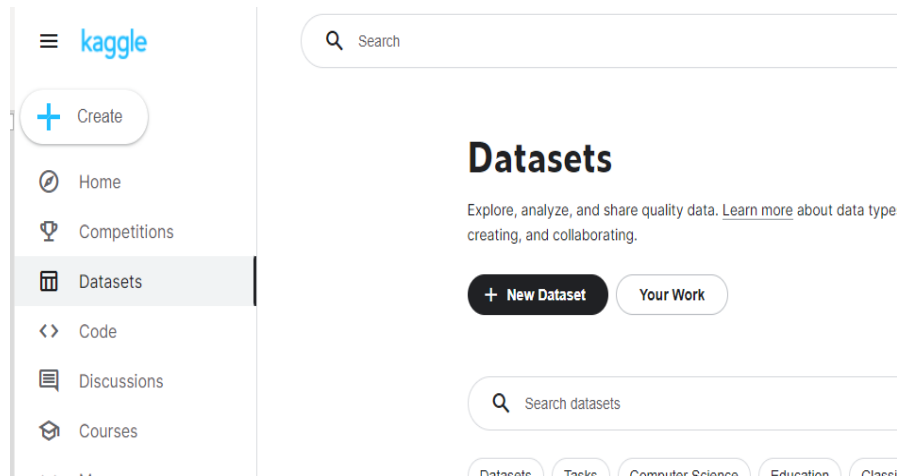


Information Science

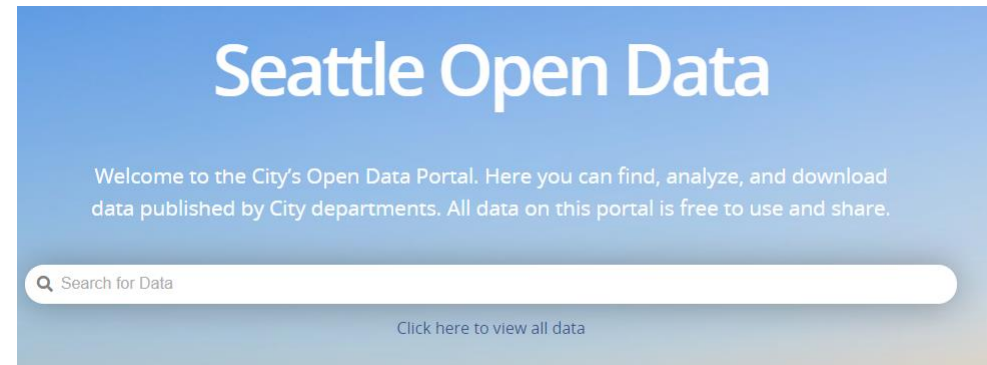
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[VIEW ALL CATEGORIES >](#)

<https://msropendata.com/>



<https://www.kaggle.com/datasets>



<https://data.seattle.gov/>



education outcome

Last updated

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Topic

Free

All

Humanities

Social sciences

Life sciences

Agriculture

Natural sciences

G

45 datasets found



2005 - 2015 Graduation Outcomes

catalog.data.gov
data.cityofnewyork.us
+1more

Updated Mar 8, 2016

2005 - 2015 Graduation Outcomes

[Explore at catalog.data.gov](#)

[Explore at NYC C](#)

Dataset updated Mar 8, 2016

Dataset provided by

data.cityofnewyork.us

Description



Strengthen Civil Society

<https://datasetsearch.research.google.com/>

Listado: <https://gist.github.com/ppiova>