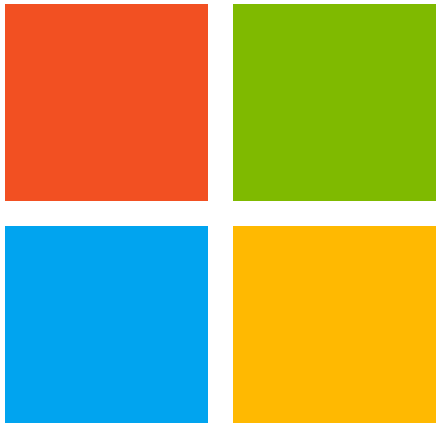


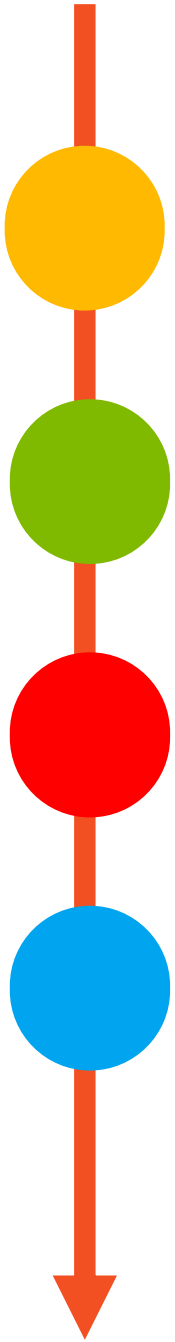
2018 TJMSC Tech. Courses

Machine Learning Practice

Dinghow Yang
Tongji Microsoft Student Club

Nov 4, 2018
Room 516, Ji Shi Building
SSE, Tongji Univ

同济微软俱乐部
Tongji Microsoft Student Club



Visual Studio & Tools for AI Configuration

Train model by Custom Vision

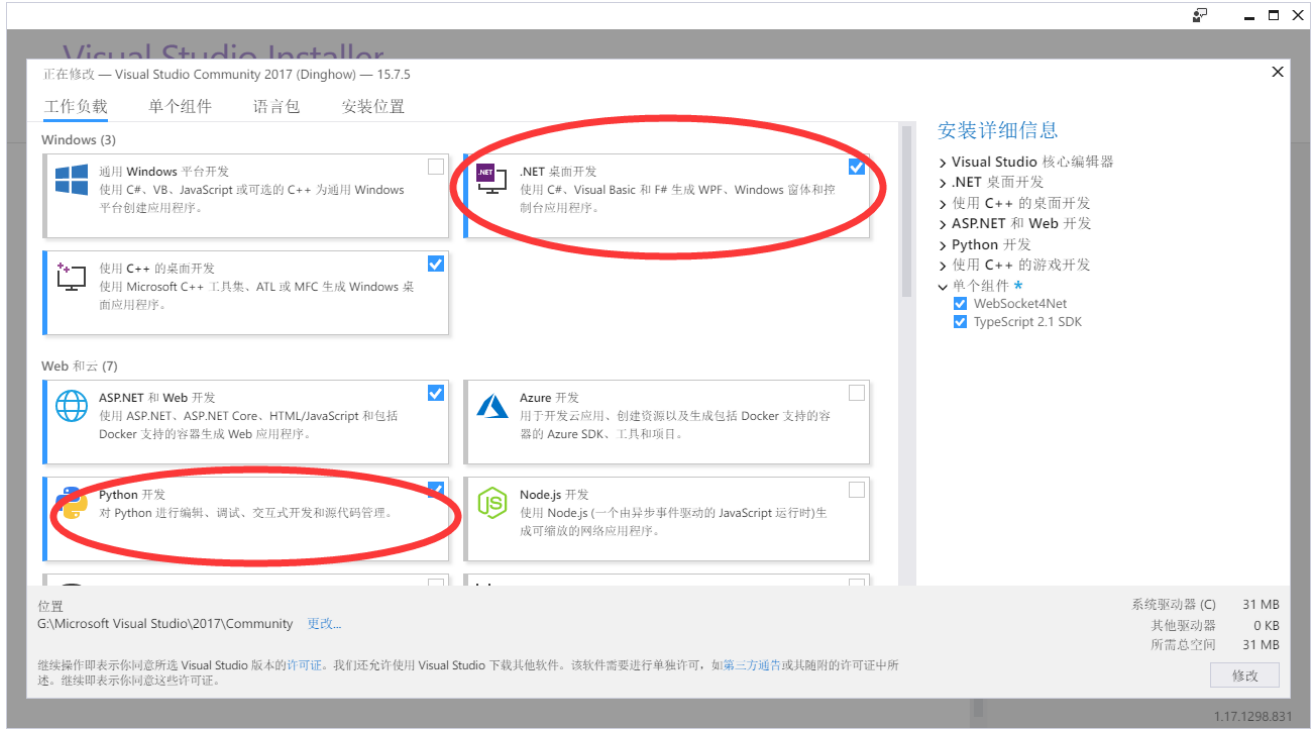
Realize a Window Form Application

Introduction of other Azure AI services

Visual Studio Configuration

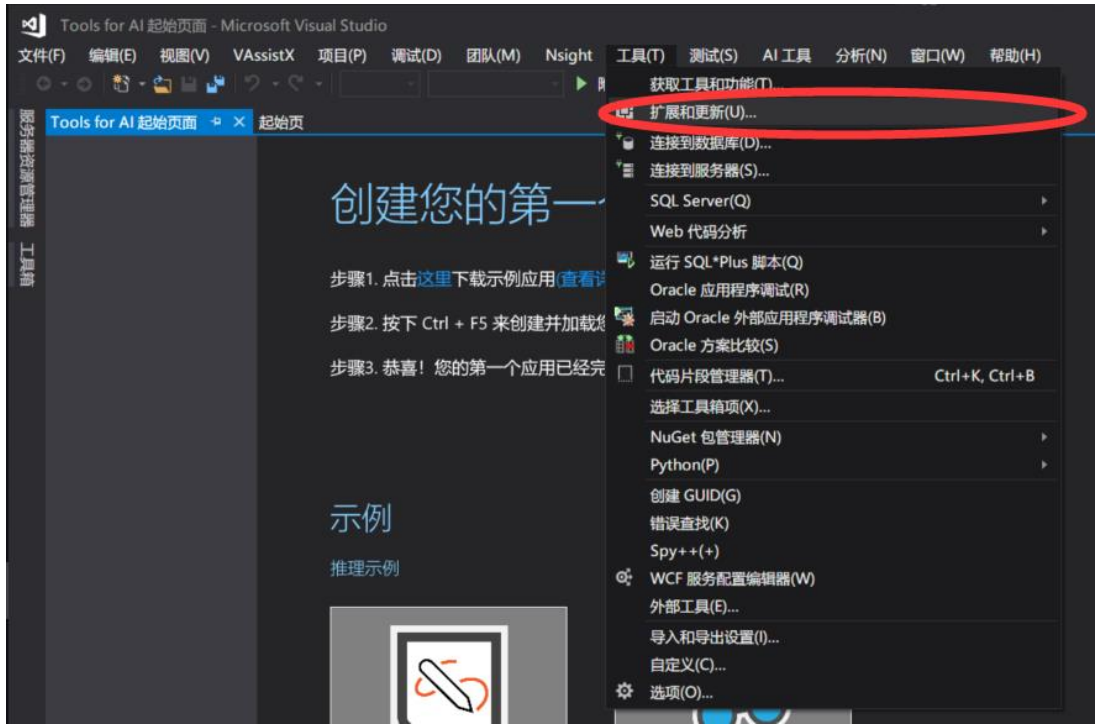
同济微软俱乐部
Tongji Microsoft Student Club

- .NET桌面开发
- Python开发

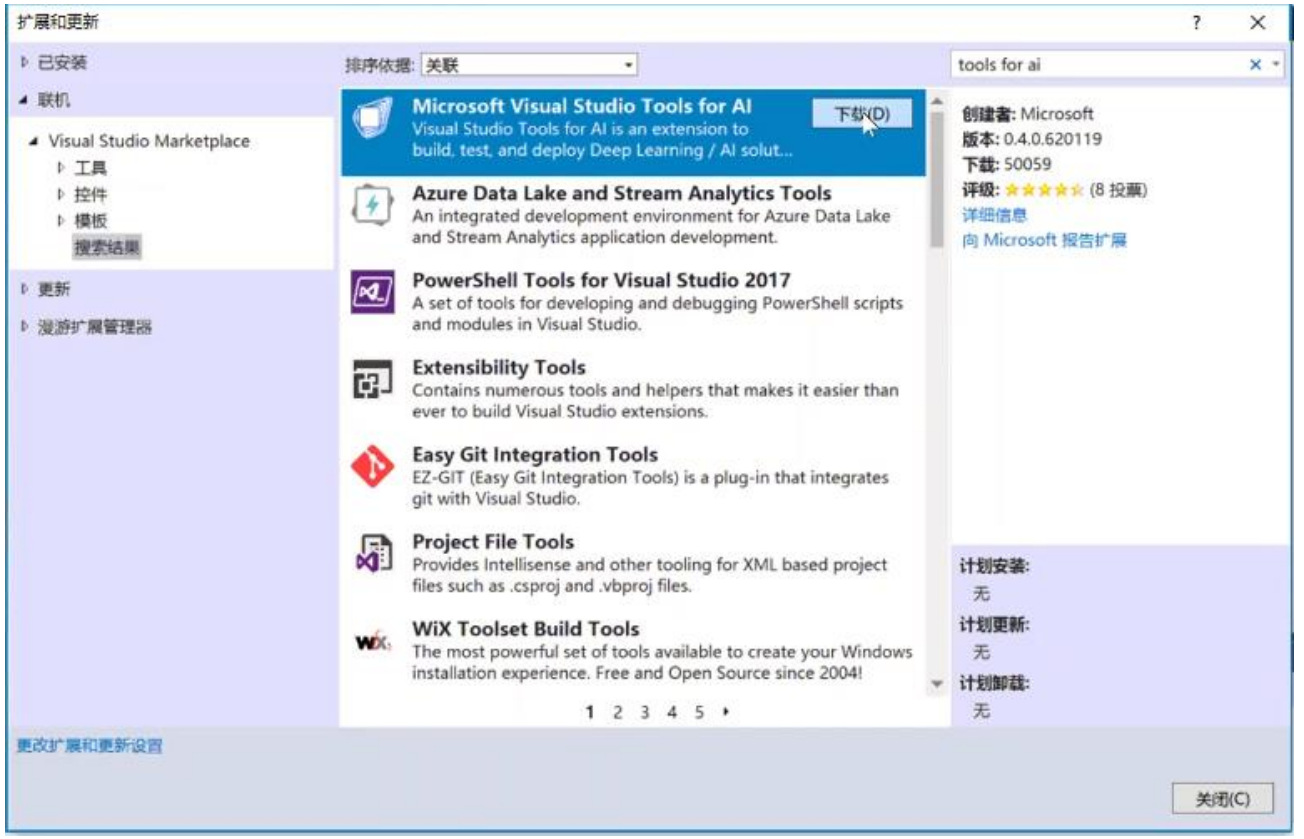


Tools for AI Configuration

同济微软俱乐部
Tongji Microsoft Student Club



Install Tools for AI



Train model by Custom Vision

同济微软俱乐部
Tongji Microsoft Student Club

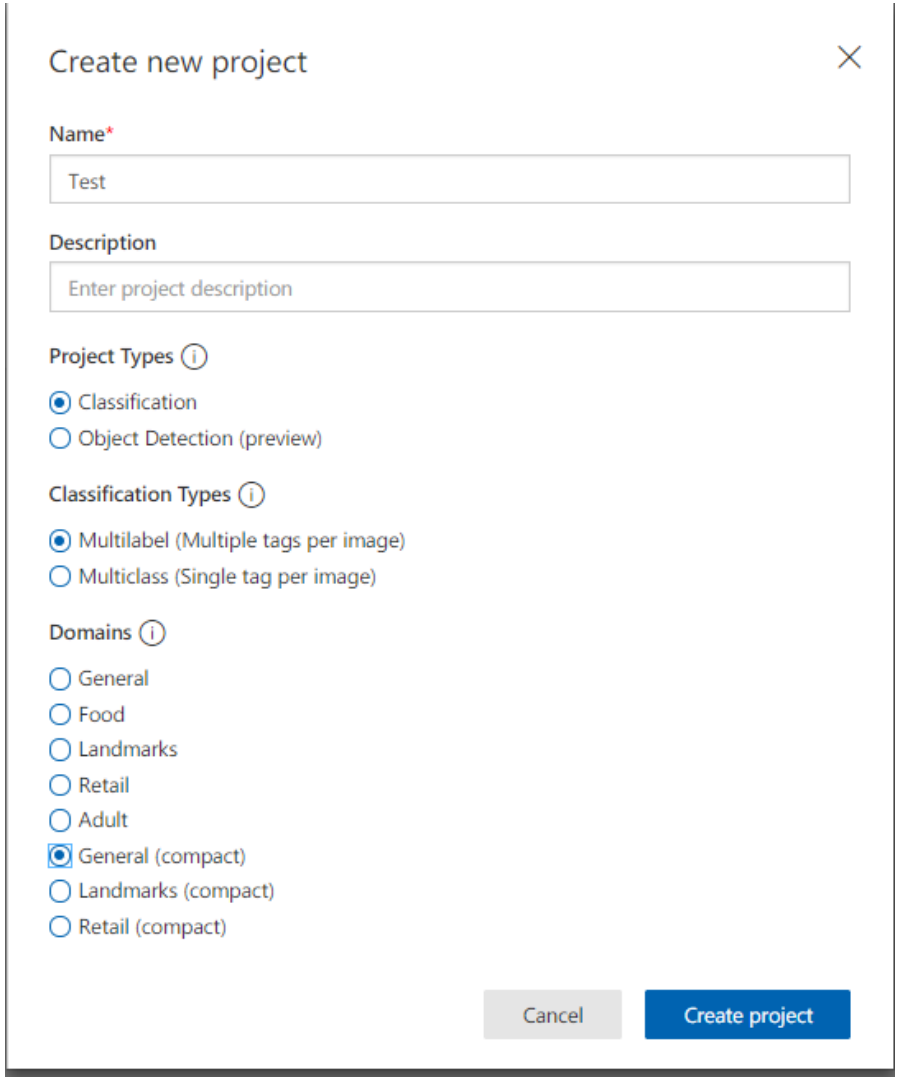
What is Custom Vision?

The Azure Custom Vision API is a cognitive service that lets you build, deploy and improve custom image classifiers. An image classifier is an AI service that sorts images into classes (tags) according to certain characteristics. Unlike the Computer Vision service, Custom Vision allows you to create your own classifications.

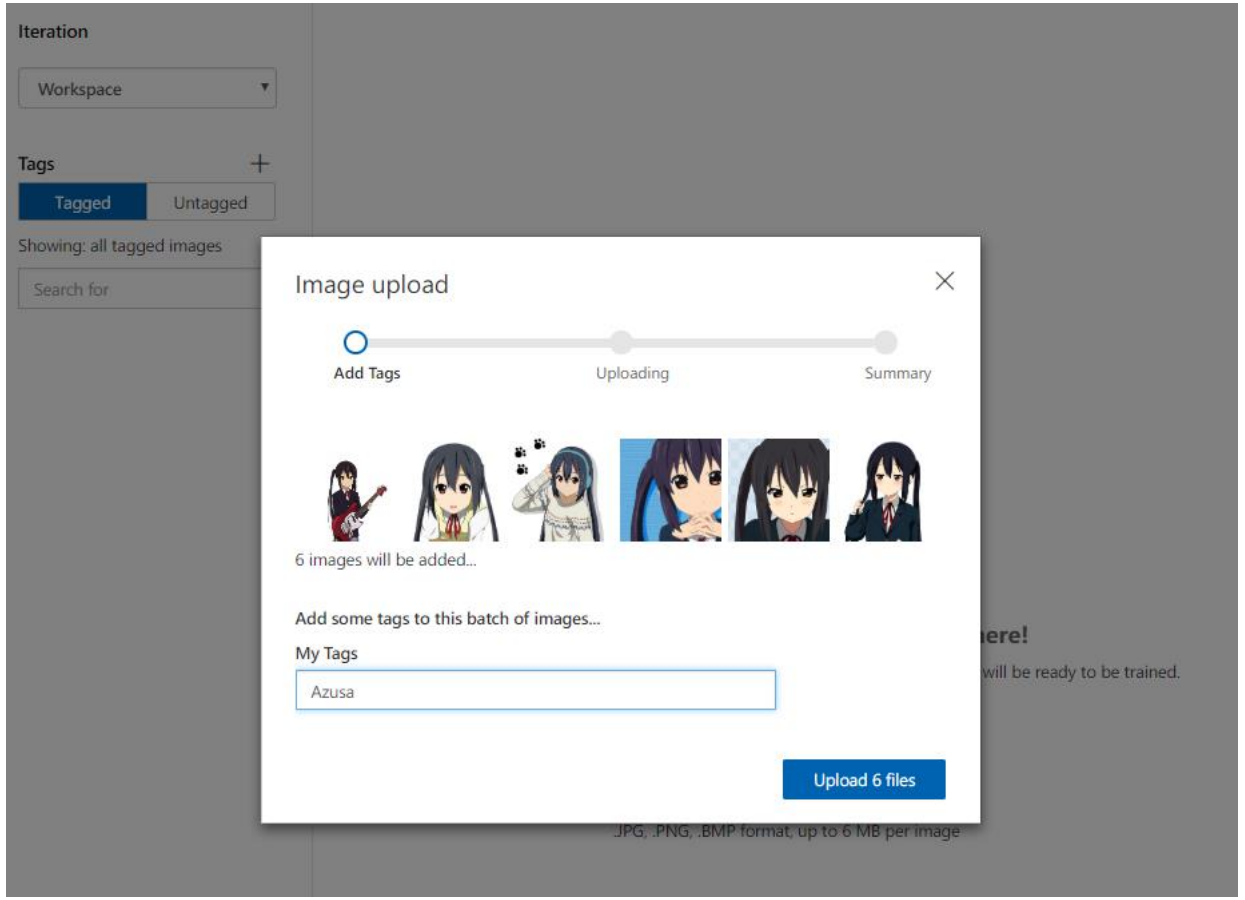
https://customvision.ai

Train model by Custom Vision

同济微软俱乐部
Tongji Microsoft Student Club

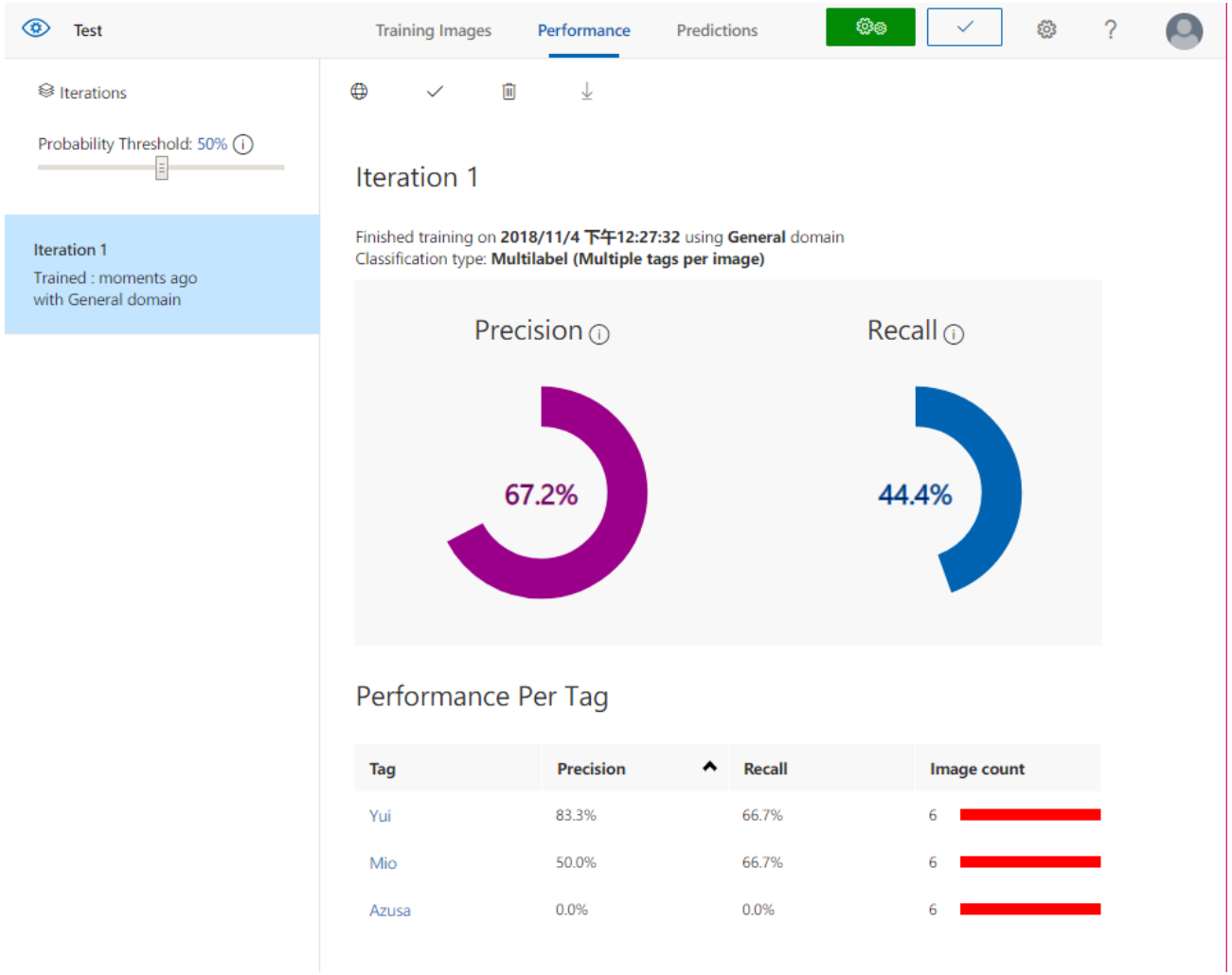


- Create new project
- Upload & tag images

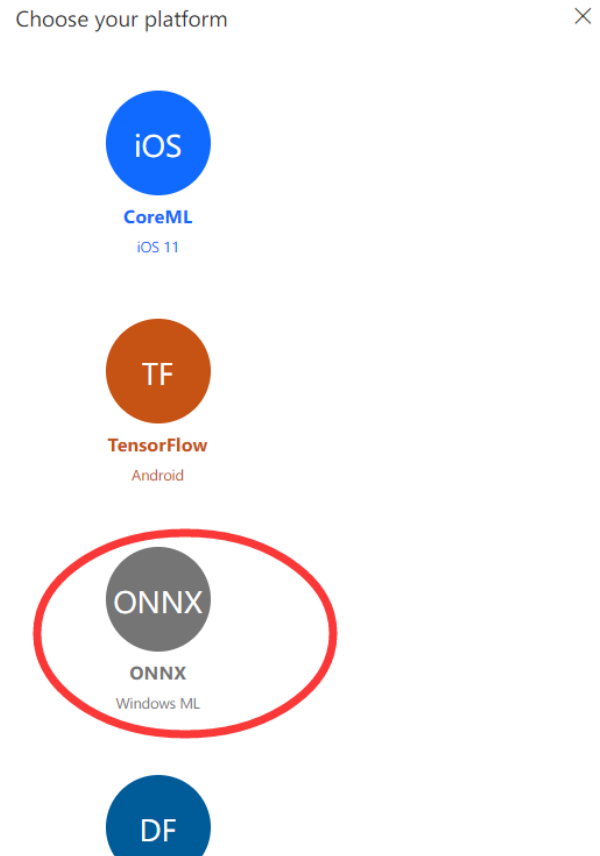


Train model by Custom Vision

同济微软俱乐部
Tongji Microsoft Student Club

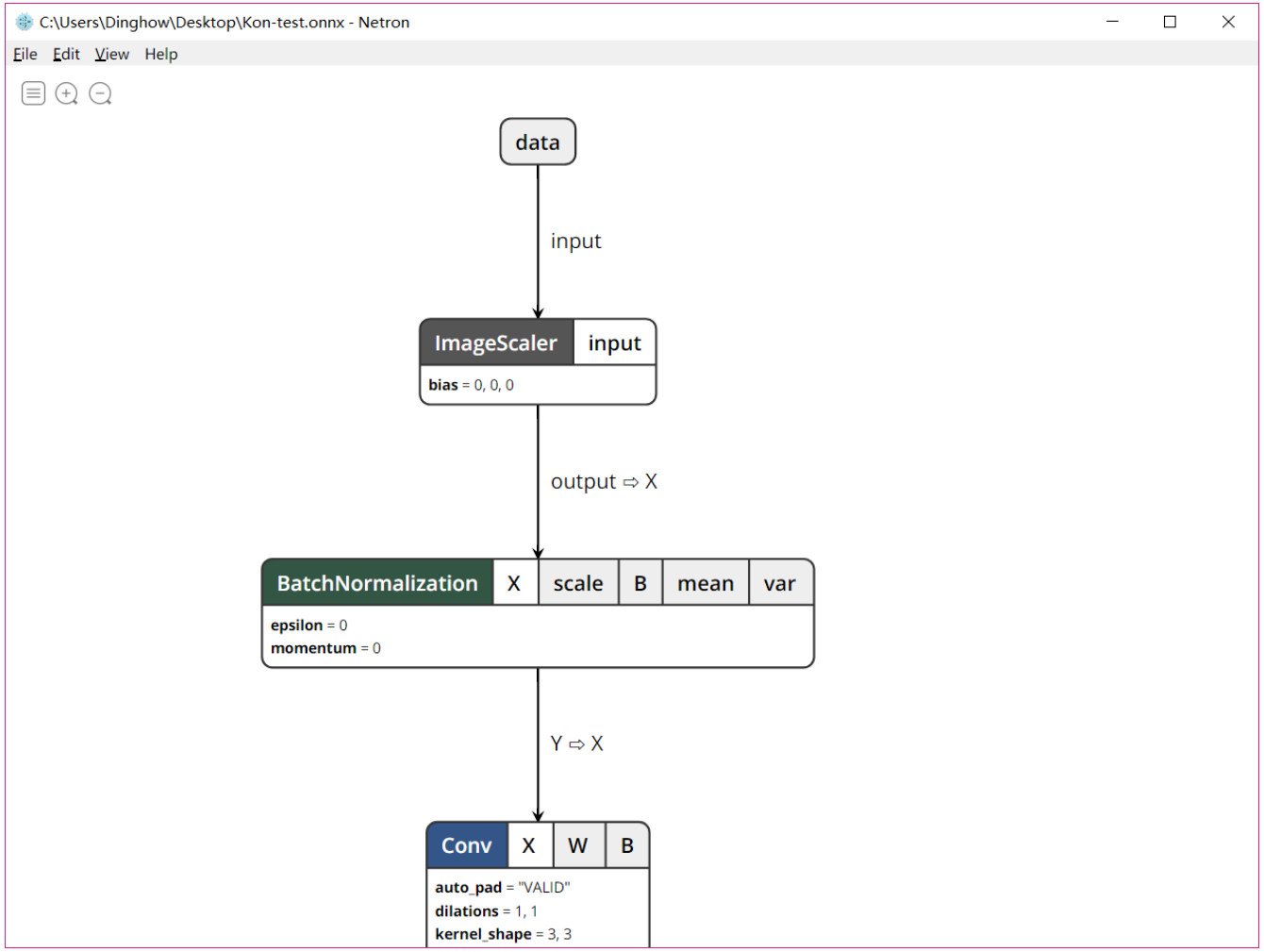


- Train model
- Download your model



Train model by Custom Vision

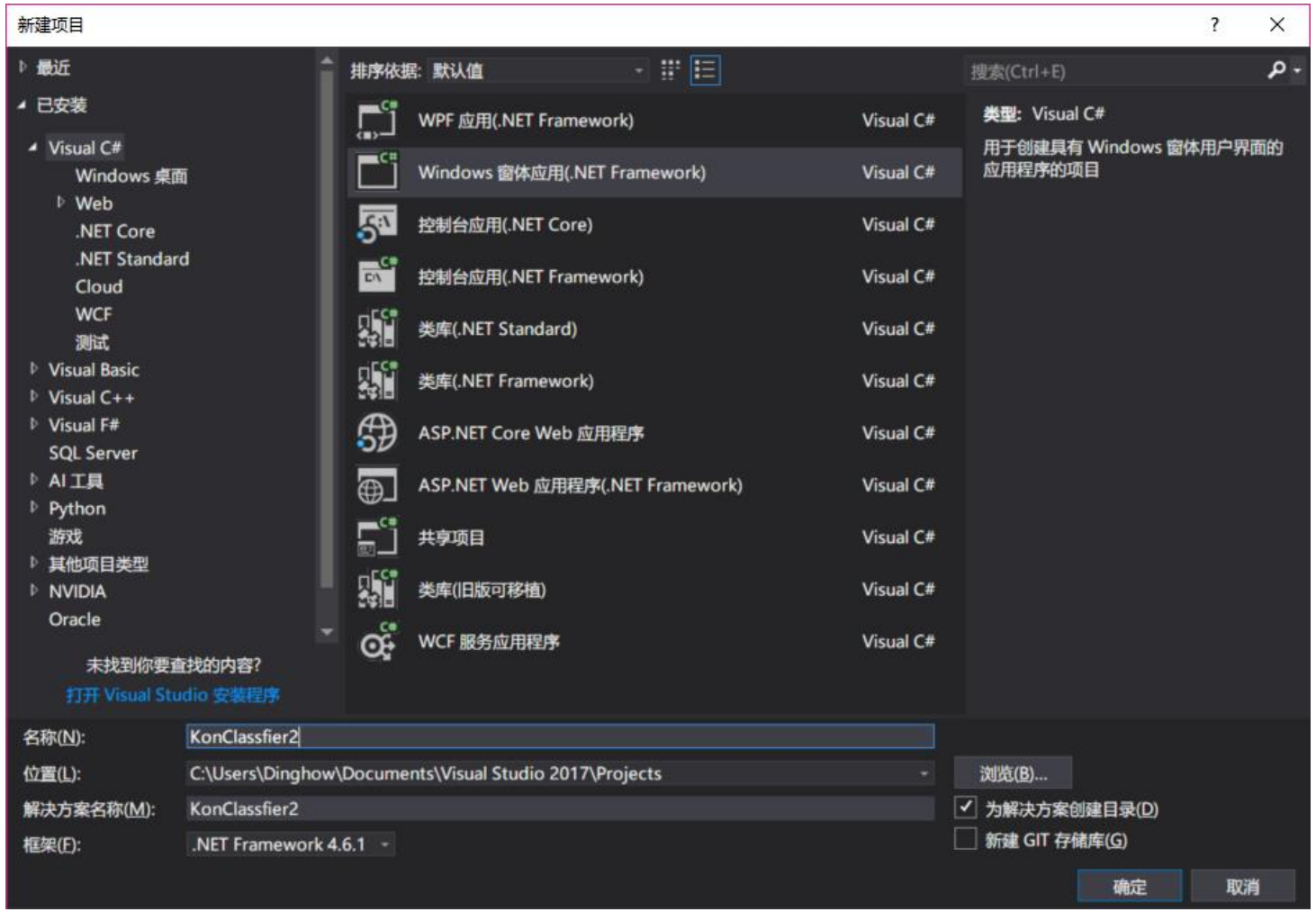
同济微软俱乐部
Tongji Microsoft Student Club



- View and Edit model by Netron

Realize a Window Form Application

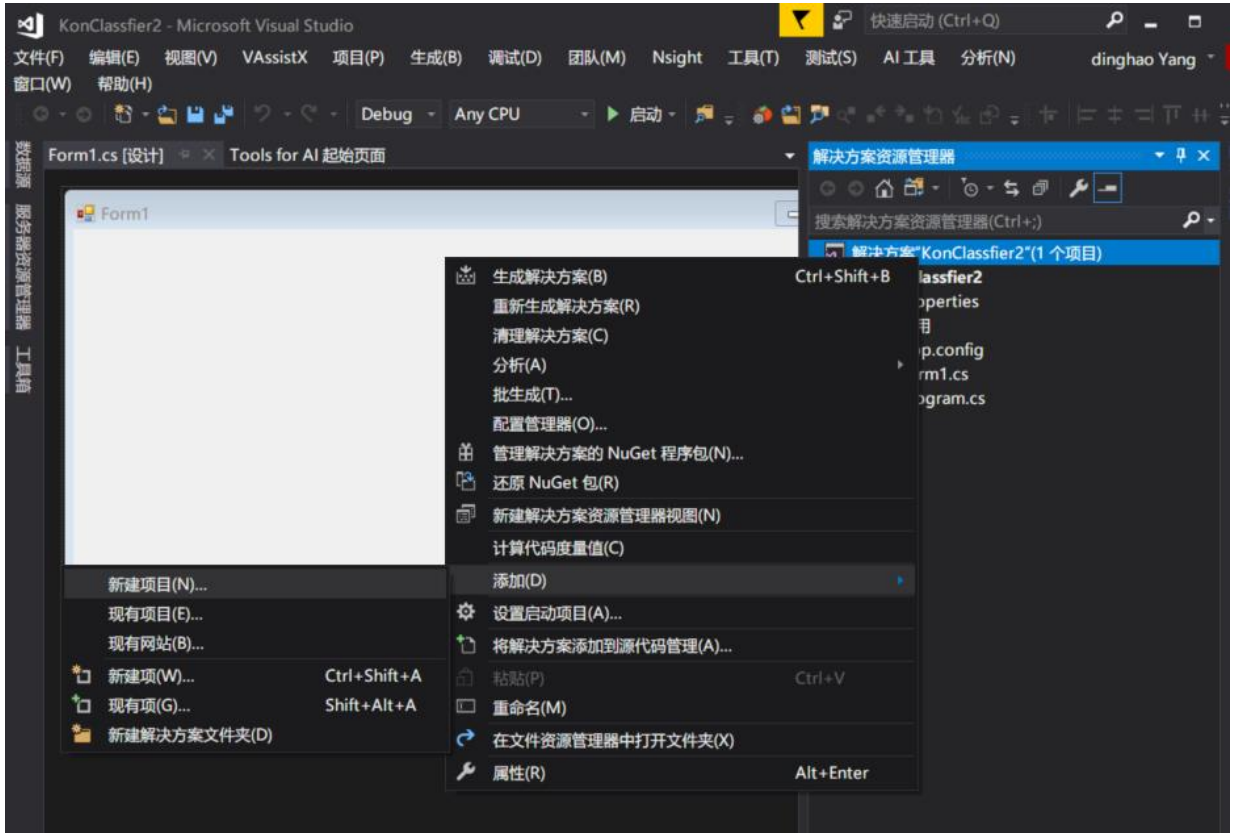
同济微软俱乐部
Tongji Microsoft Student Club



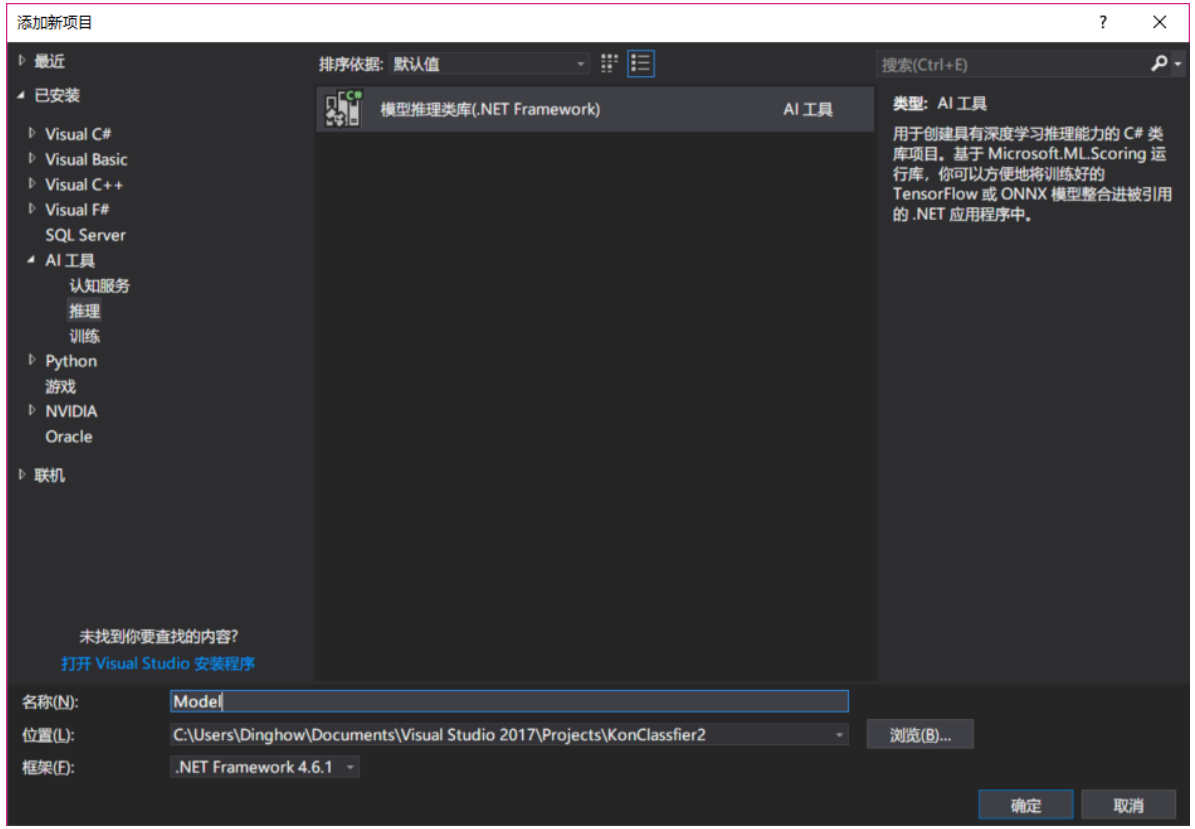
- Create a WFA project

Realize a Window Form Application

同济微软俱乐部
Tongji Microsoft Student Club



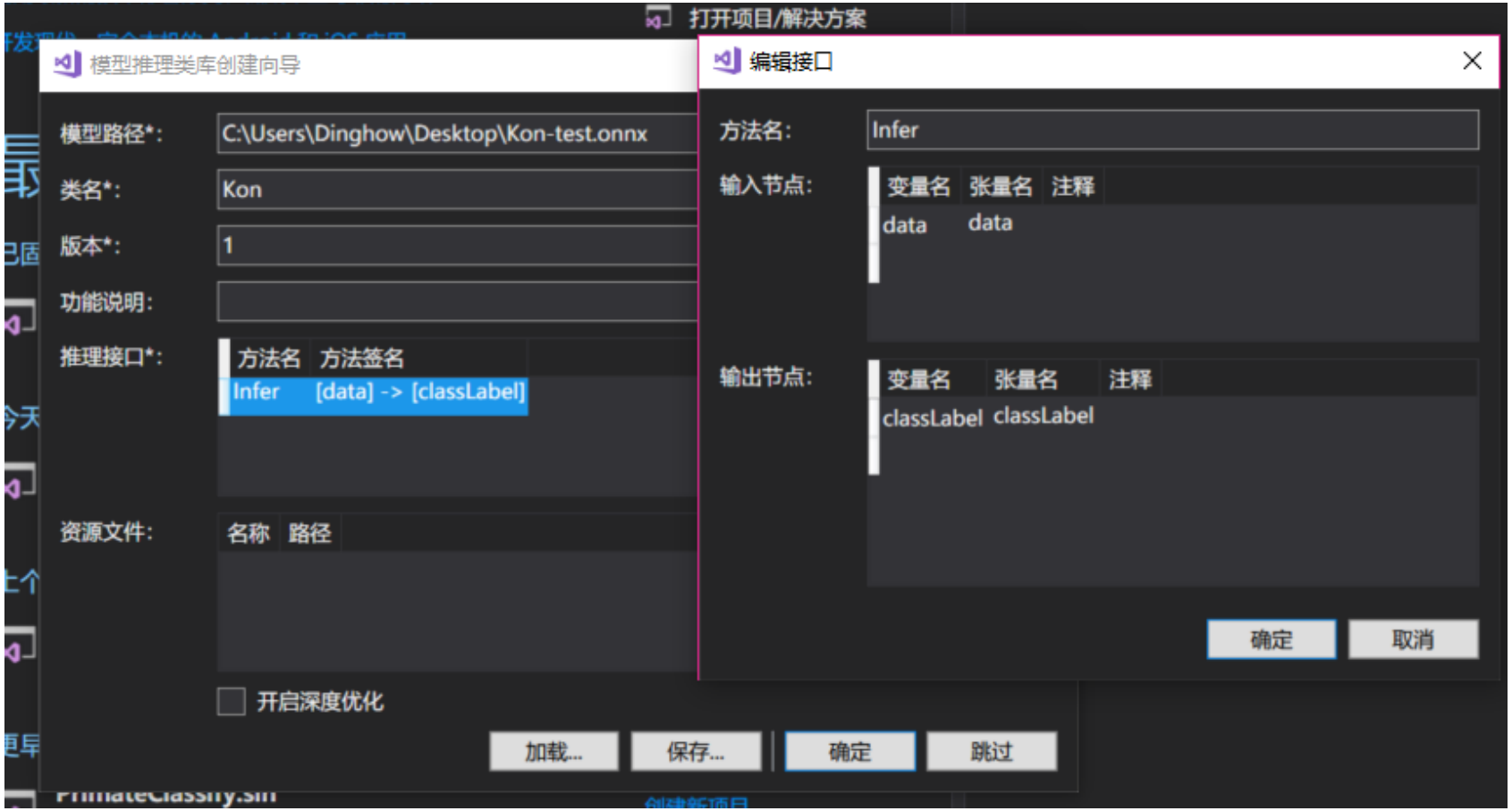
- Add an AI Model project



Realize a Window Form Application

同济微软俱乐部
Tongji Microsoft Student Club

- Configure your model



Realize a Window Form Application

同济微软俱乐部
Tongji Microsoft Student Club

```
/// </summary>
public IEnumerable<IEnumerable<string>> Infer(IEnumerable<IEnu
{
    List<float> dataCombined = new List<float>();
    foreach (var input in dataBatch)
    {
        dataCombined.AddRange(input);
    }

    List<Tensor> result = manager.RunModel(
        modelName,
        int.MaxValue,
        inferInputNames,
        new List<Tensor> { new Tensor(dataCombined, new List<lo
        inferOutputNames
    );

    List<string> r0 = new List<string>();
    result[0].CopyTo(r0);
    return r0;

```

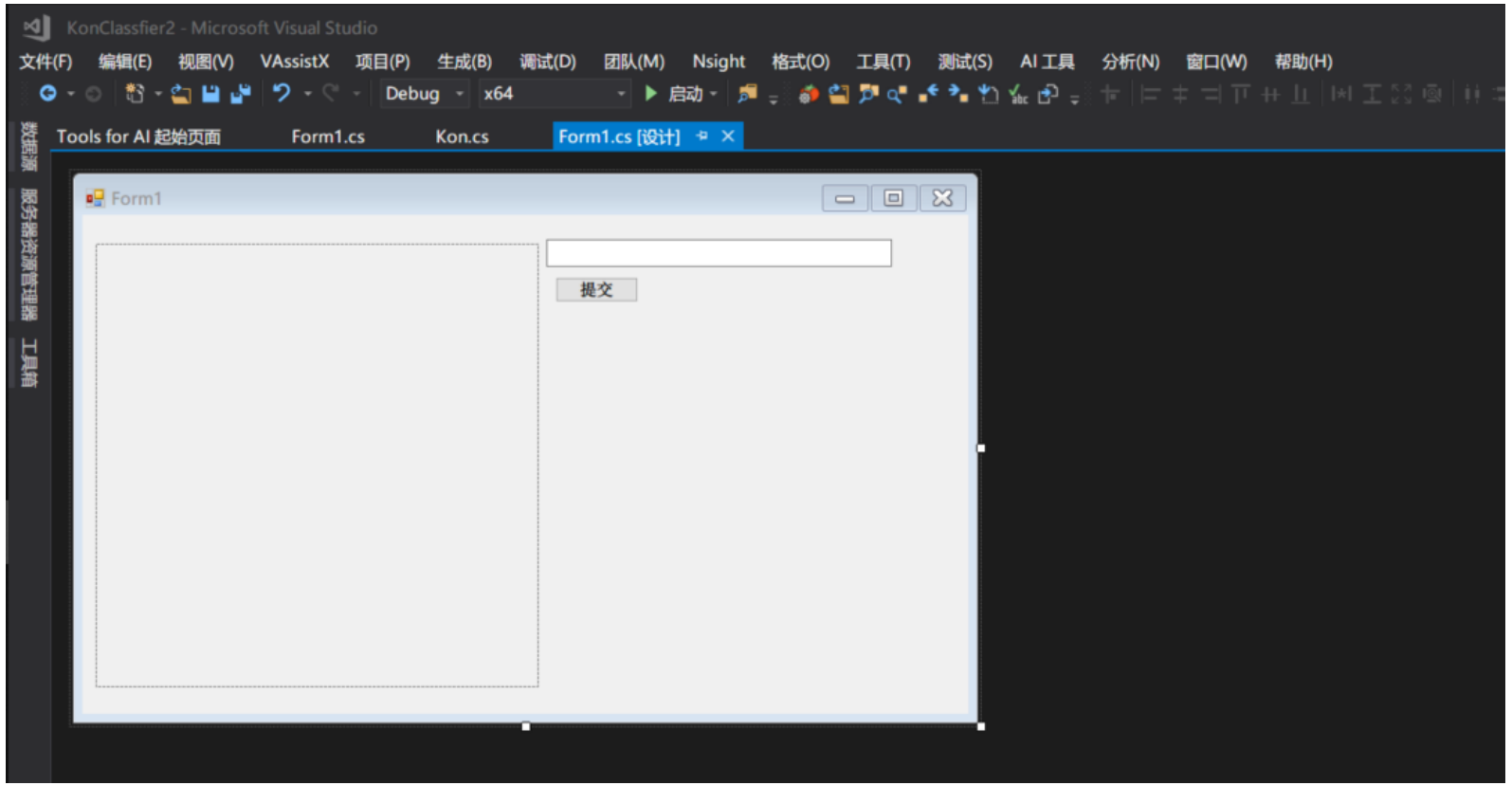
```
App.config
Form1.cs
Program.cs
Model
  Properties
  引用
  Kon
    00000001
      Kon-test.onnx
      manifest.json
    Kon.cs
      Kon
  packages.config
```

- Edit codes in model class

```
            int.MaxValue,
            inferInputNames,
            new List<Tensor> { new Tensor(dataCombined, new List<lo
            inferOutputNames
        );

        List<string> r0 = new List<string>();
        result[0].CopyTo(r0);

        List<List<string>> results = new List<List<string>>();
        results.Add(r0);

        return results;
    }
```

Realize a Window Form Application

同济微软俱乐部
Tongji Microsoft Student Club



- Add elements to your window

Realize a Window Form Application

同济微软俱乐部
Tongji Microsoft Student Club

```
namespace KonClassfier2
{
    public partial class Form1 : Form
    {
        public Form1()
        {
            InitializeComponent();
        }

        private const int imageSize = 227;
        private Model.Kon model;

        private void Form1_Load(object sender, EventArgs e)
        {
            model = new Model.Kon();
        }

        private void button1_Click(object sender, EventArgs e)
        {
            bool isSuccess = false;

            label1.Text = string.Empty;
            pictureBox1.Image = null;
            pictureBox1.Refresh();

            try
            {
                pictureBox1.Load(textBox1.Text);
                isSuccess = true;
            }
            catch (Exception ex)
            {
                MessageBox.Show("图片读取错误！", ex.Message);
            }

            if (isSuccess)
            {
                //Reform the input image
```

```
            try
            {
                pictureBox1.Load(textBox1.Text);
                isSuccess = true;
            }
            catch (Exception ex)
            {
                MessageBox.Show("图片读取错误！", ex.Message);
            }

            if (isSuccess)
            {
                //Reform the input image
                Bitmap clonedBmp = new Bitmap(imageSize, imageSize);
                Graphics gNormalized = Graphics.FromImage(clonedBmp);

                gNormalized.DrawImage(pictureBox1.Image, 0, 0, imageSize, imageSize);

                var imageArray = new float[imageSize * imageSize * 3];
                for (int y = 0; y < imageSize; y++)
                {
                    for (int x = 0; x < imageSize; x++)
                    {
                        var color = clonedBmp.GetPixel(x, y);

                        imageArray[y * imageSize + x] = color.B;
                        imageArray[y * imageSize + x + imageSize * imageSize] = color.G;
                        imageArray[y * imageSize + x + 2 * imageSize * imageSize] = color.R;
                    }
                }

                //Get result by accessing model
                var result = model.Infer(new List<IEnumerable<float>> { imageArray }).First().First();

                label1.Text = result;
            }
        }
```

- Add functions

Realize a Window Form Application

同济微软俱乐部
Tongji Microsoft Student Club

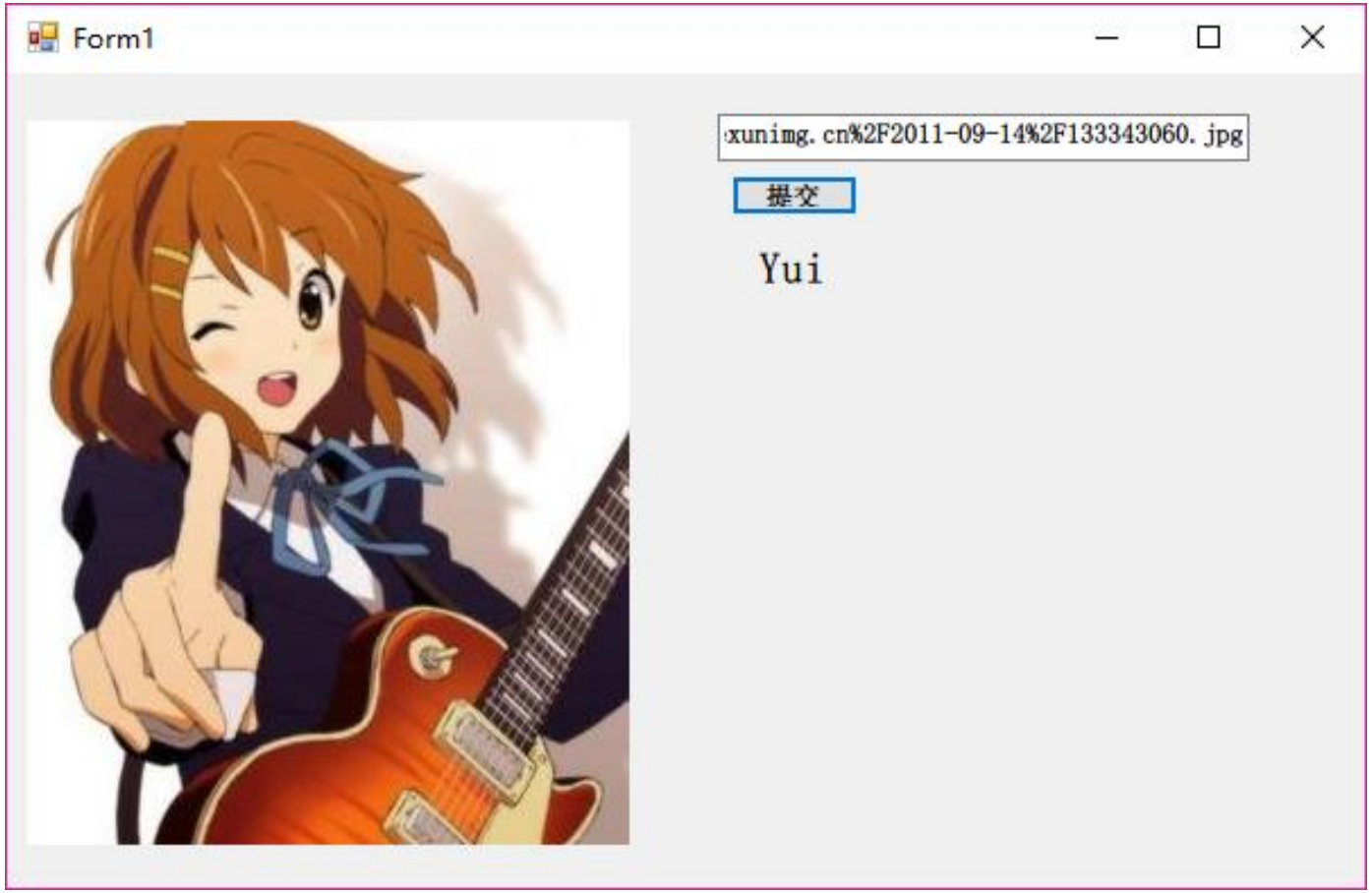
```
namespace KonClassfier2
{
    public partial class Form1 : Form
    {
        public Form1()
        {
            InitializeComponent();
        }

        private const int imageSize = 227;
        private Model.Kon model;

        private void Form1_Load(object sender, EventArgs e)
        {
            model = new Model.Kon();
        }

        private void button1_Click(object sender, EventArgs e)
        {
            bool isSuccess = false;

            label1.Text = string.Empty;
            pictureBox1.Image = null;
            pictureBox1.Refresh();

            try
            {
                pictureBox1.Load(textBox1.Text);
                isSuccess = true;
            }
            catch (Exception ex)
            {
                MessageBox.Show("图片读取错误！", ex.Message);
            }

            if (isSuccess)
            {
                //Reform the input image
```

```
            try
            {
                pictureBox1.Load(textBox1.Text);
                isSuccess = true;
            }
            catch (Exception ex)
            {
                MessageBox.Show("图片读取错误！", ex.Message);
            }

            if (isSuccess)
            {
                //Reform the input image
                Bitmap clonedBmp = new Bitmap(imageSize, imageSize);
                Graphics gNormalized = Graphics.FromImage(clonedBmp);

                gNormalized.DrawImage(pictureBox1.Image, 0, 0, imageSize, imageSize);

                var imageArray = new float[imageSize * imageSize * 3];
                for (int y = 0; y < imageSize; y++)
                {
                    for (int x = 0; x < imageSize; x++)
                    {
                        var color = clonedBmp.GetPixel(x, y);

                        imageArray[y * imageSize + x] = color.B;
                        imageArray[y * imageSize + x + imageSize * imageSize] = color.G;
                        imageArray[y * imageSize + x + 2 * imageSize * imageSize] = color.R;
                    }
                }

                //Get result by accessing model
                var result = model.Infer(new List<IEnumerable<float>> { imageArray }).First().First();

                label1.Text = result;
            }
        }
```

- Add functions

Realize a Window Form Application

同济微软俱乐部
Tongji Microsoft Student Club



- Run your application!

Introduction of other Azure AI services

同济微软俱乐部
Tongji Microsoft Student Club

使用 AI 解决业务问题

影像
图像处理算法能智能标识图像、描述图像 和调整图像大小。

语音
将语言音频转换为文本，使用声音进行验证， 或向应用添加识别。

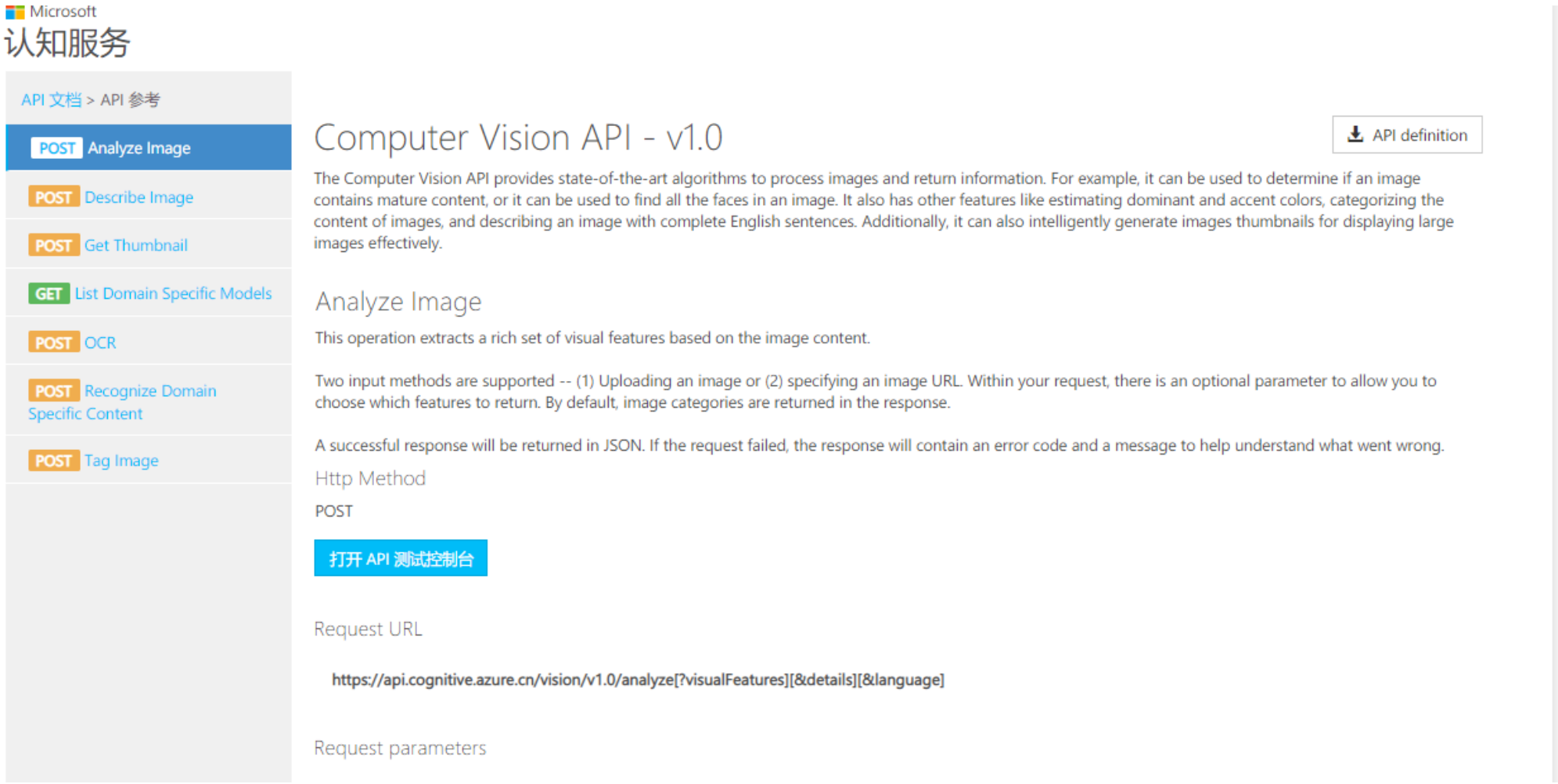
知识
通过映射复杂信息和数据来解决任务，例如 智能建议和语义搜索。

搜索
将必应搜索 API 添加到应用之中， 通过单个 API 调用梳理数网页、图像、视频和新闻。

语言
允许应用通过预生成脚本处理自然语言、 评估情绪，并了解如何识别用户需求。

Introduction of other Azure AI services

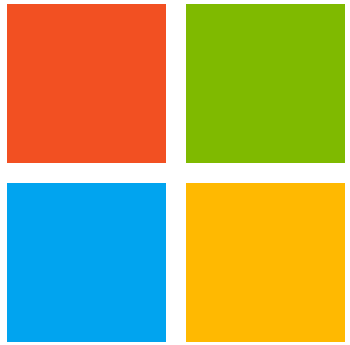
同济微软俱乐部
Tongji Microsoft Student Club



Learning Resources

同济微软俱乐部
Tongji Microsoft Student Club

- 微软AI B站主页： https://space.bilibili.com/333935914/
- 微软ML环境搭建：https://www.cnblogs.com/ms-uap/p/9123033.html
- Custom Vision: https://customvision.ai/
- Custom Vision Demo制作：https://www.bilibili.com/video/av26004062
- Azure认知服务: https://dev.cognitive.azure.cn/



Microsoft

同济微软俱乐部
Tongji Microsoft Student Club

微软学生俱乐部

扫一扫二维码，加入该群。

关注TJMSC微信公众号