

# SDK for C# of caffe user's Guidance

## Introduction:

As we know, C# is the best develop language for windows, but for the deep learning tool---caffe, it only have the interface of C++/Python/Matlab, it's so inconvenient for AI application developed in windows, and there are few course of C# use caffe, and they also have many faults. So in this project, I develop a SDK for C# developer to let them can develop more AI application for windows. They only need to have its own caffemodel, they can use our SDK develop any any application for windows. For example, in this project, we train a caffemodel to predict one face's age and gender, and then we use model and SDK, develop a application, which can check video's face's age and gender real time, and then we play ads based on its age and gender. Next, I will introduce how to use our SDK to develop our own application.

## Configure:

- 1、System : x64 windows system.
- 2、Develop tool:  
Recommend: Microsoft visual studio 2013 community  
PS: I don't try other tools.

## Interface Specifier:

Object	Parameters
LibCaffeWrapper	int classInfo (any)

Object	Function	Parameters	Output		Meaning
LibCaffeWrapper	GetClassInfo	None	Int class	Image's class info	Get image's class info(one model)
LibCaffeWrapper	GetConfidence	none	Float confidence	Prediction's confidence	Get image's Confidence(one model)

LibCaffeWrapper	ANGPredict	string amodel_file	//model information' s road *.prototxt(m odel 1)	none		Predict one image by two model(multe- lable),but its speed is slow,
		string atraind_file	Traied model road *.caffemod el (model 1)			
		string amean_file	Mean file's road *.binaryprot o(model 1)			
		string gmodel_file	//model information 's road *.prototxt( model 2)			
		string gtraind_file	Traied model road *.caffemod el (model 2)			
		string gmean_file	Mean file's road *.binaryprot o(model 2)			
		string image_file	Ready to check image's file road (model 2)			
LibCaffeWrapper	GetAgeClassIn fo	None		Int class	Image's class info	Get model 1 's calss info
LibCaffeWrapper	GetAgeConfid ence	none		Float confidence	Prediction's confidence	Get image's model 1 's Confidence(one model)
LibCaffeWrapper	GetGenderCla ssInfo	None		Int class	Image's class info	Get model 2 's calss info
LibCaffeWrapper	GetGenderCo nfidence	None		Float confidence	Prediction's confidence	Get image's model 2's Confidence(one model)
LibCaffeWrapper	Predict	string	//model	none		Predict some

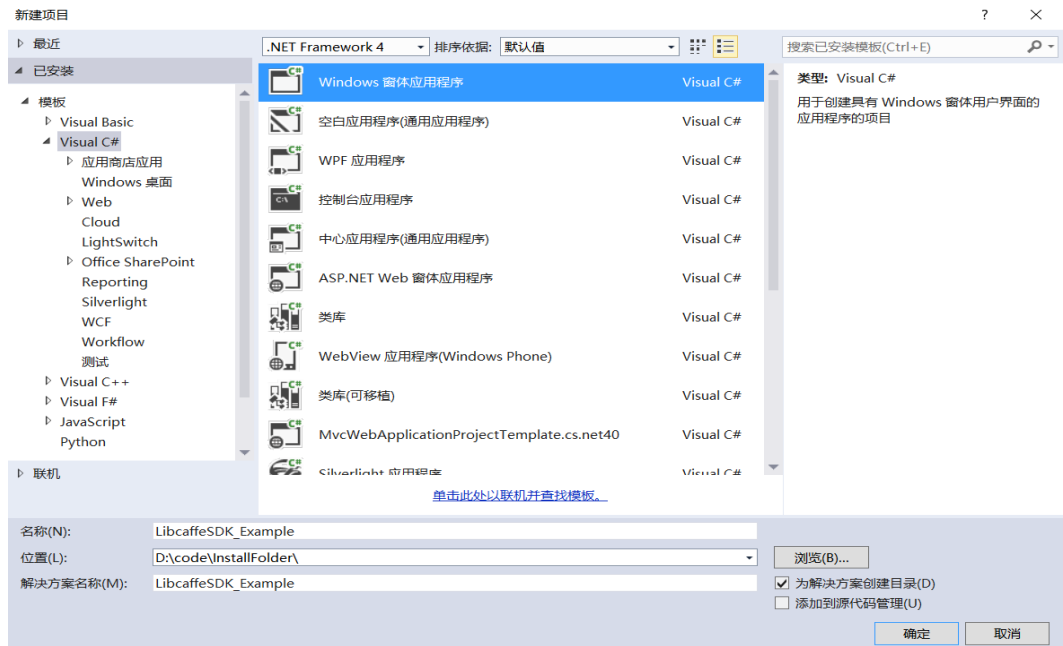
		model_file	information's road *.prototxt		image by one model
		string trained_file	Traied model road *.caffemodel		
		string mean_file	Mean file's road *.binaryproto		
		string image_file	Ready to check image's file road		

### Calling procedure:

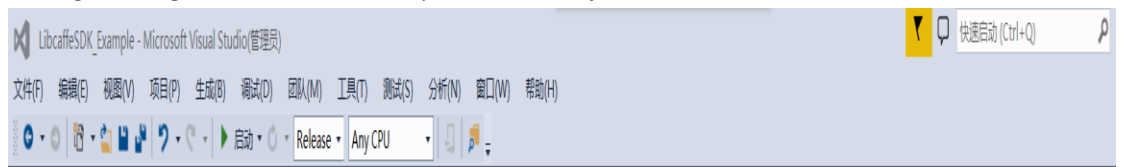
- 1、 Statement LibcaffeWrapper object。
- 2、 Initial object
- 3、 Make predict by function Predict or ANGPredict
- 4、 Get results by GetClass() and so on.

### Example:




























- 1、 Create a new C# Form application like this



2、Change configure to Release, and platform is Any CPU

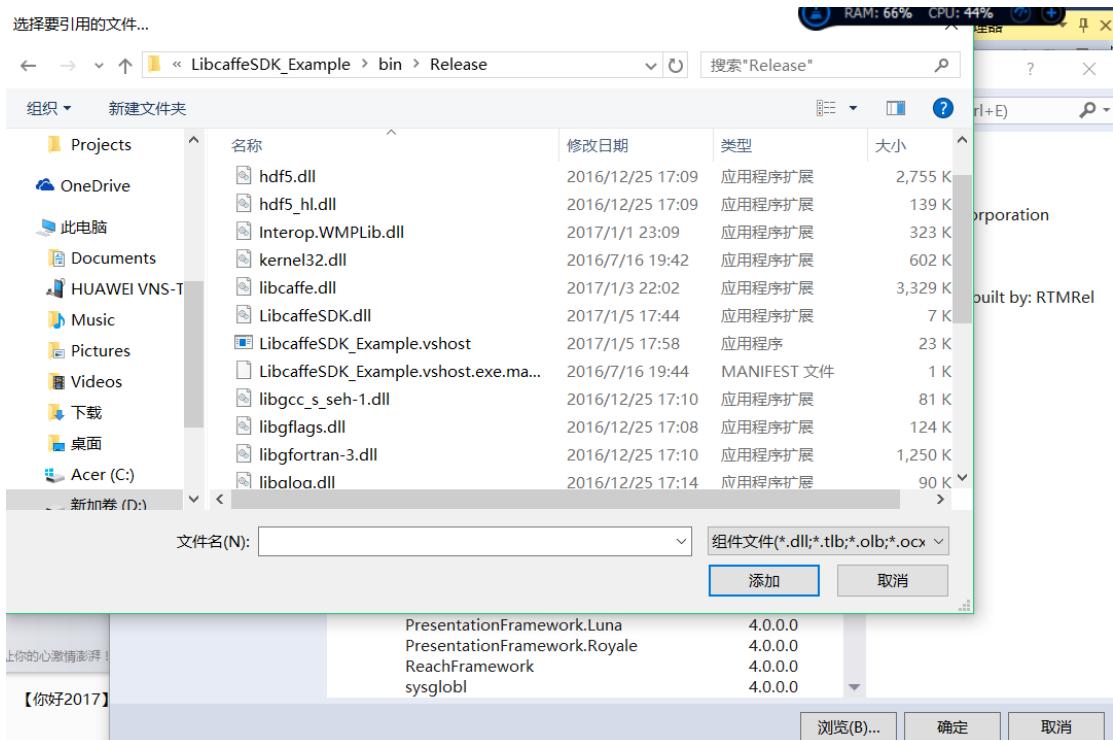


3、Copy all SDK to The output directory of the project

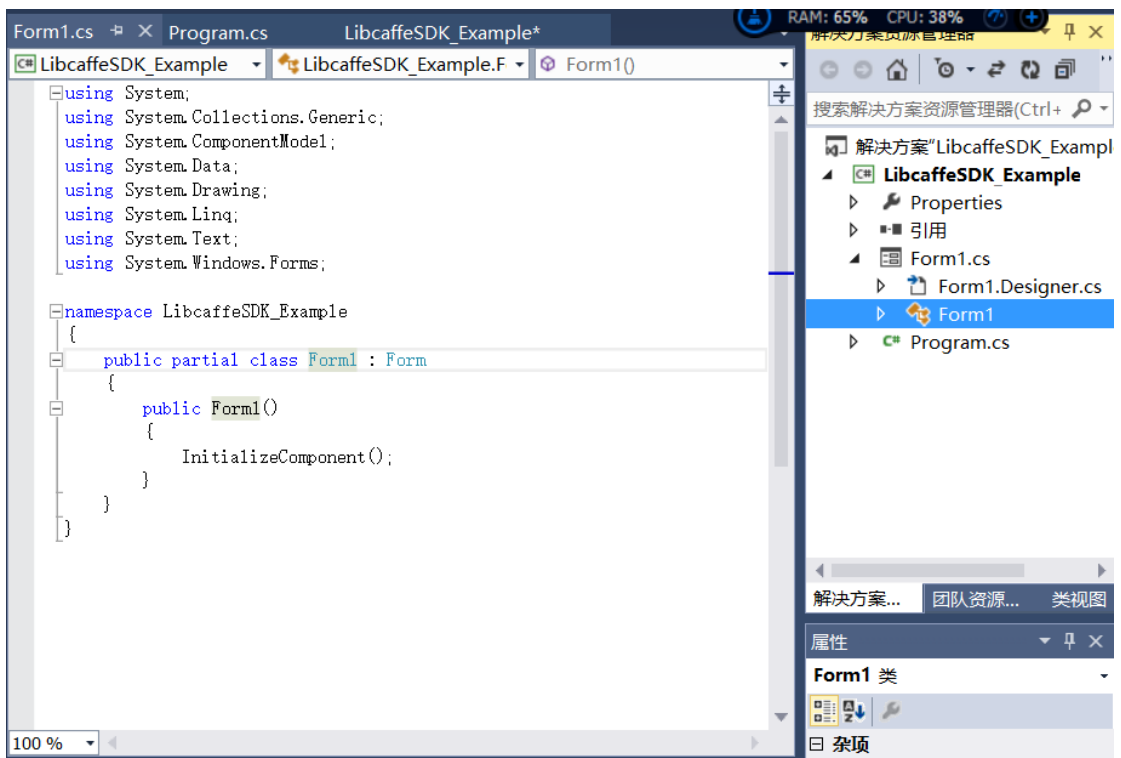
 advapi32.dll	2016/7/16 19:42	应用程序扩展	472 KB
 AxInterop.WMPLib.dll	2017/1/1 23:09	应用程序扩展	53 KB
 hdf5.dll	2016/12/25 17:09	应用程序扩展	2,755 KB
 hdf5_hl.dll	2016/12/25 17:09	应用程序扩展	139 KB
 Interop.WMPLib.dll	2017/1/1 23:09	应用程序扩展	323 KB
 kernel32.dll	2016/7/16 19:42	应用程序扩展	602 KB
 libcaffe.dll	2017/1/3 22:02	应用程序扩展	3,329 KB
 libcaffe	2017/1/3 22:01	Exports Library F...	2 KB
 libcaffe	2017/1/1 19:43	Object File Library	3 KB
 libcaffe	2017/1/3 22:02	Program Debug ...	16,780 KB
 LibcaffeSDK.dll	2017/1/5 17:44	应用程序扩展	7 KB
 LibcaffeSDK	2017/1/5 17:44	Program Debug ...	16 KB
 libgcc_s_seh-1.dll	2016/12/25 17:10	应用程序扩展	81 KB
 libgflags.dll	2016/12/25 17:08	应用程序扩展	124 KB
 libgfortran-3.dll	2016/12/25 17:10	应用程序扩展	1,250 KB
 libglog.dll	2016/12/25 17:14	应用程序扩展	90 KB
 libopenblas.dll	2016/12/25 17:10	应用程序扩展	37,442 KB
 libquadmath-0.dll	2016/12/25 17:10	应用程序扩展	324 KB
 lmdb.dll	2016/12/25 17:09	应用程序扩展	71 KB
 msvcpr120.dll	2013/10/4 23:58	应用程序扩展	645 KB
 msvcr120.dll	2013/10/4 23:58	应用程序扩展	941 KB
 opencv_core2410.dll	2016/12/25 17:14	应用程序扩展	2,514 KB
 opencv_highgui2410.dll	2016/12/25 17:14	应用程序扩展	2,354 KB
 opencv_imgproc2410.dll	2016/12/25 17:14	应用程序扩展	2,184 KB
 szip.dll	2016/12/25 17:09	应用程序扩展	75 KB
 wmp.dll	2016/11/2 18:22	应用程序扩展	13,126 KB
 zlib.dll	2016/12/25 17:09	应用程序扩展	108 KB

- 4、Right-click the project, add a reference from the output directory to find "LibcaffeSDK.dll", and add it





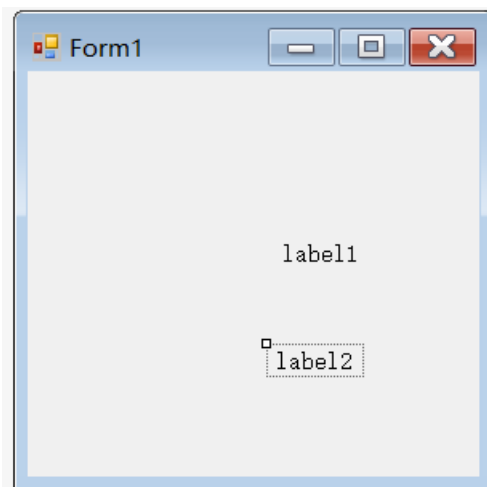
5、To Form1()'s source code,



Add `using LibcaffeSDK;`

```
using System;
using System.Collections.Generic;
using System.ComponentModel;
using System.Data;
using System.Drawing;
using System.Linq;
using System.Text;
using System.Windows.Forms;
using LibcaffeSDK;
```

- 6、Switch to Form1() interface, add two label, named label1 and label2. Like this:



- 7、Switch to Form1() source code,  
Change code like this,(And the way is in the annotation)

```
public Form1()
{
    InitializeComponent();

    LibCaffeWrapper Age; //Declare the object
    Age = new LibCaffeWrapper(1); //initial object

    Age.Predict("deploy_age.prototxt", //model information
               "age_net.caffemodel", //trained model
               "g_mean1229.binaryproto", //mean file
               "example_image.jpg"); //image road

    // in this project, it's a age predct
    //do prediction

    string AgeString = "";
    int AgeClass = Age.GetClassInfo(); //Get classInfo
    float AgeConfidence = Age.GetConfidence();
```

```

if (AgeClass == 0)
{
    AgeString = "(0-2)";

}
else if (AgeClass == 1)
{
    AgeString = "(4-6)";

}
else if (AgeClass == 2)
{
    AgeString = "(8-13)";

}
else if (AgeClass == 3)
{
    AgeString = "(15-20)";

}
else if (AgeClass == 4)
{
    AgeString = "(25-32)";

}
else if (AgeClass == 5)
{
    AgeString = "(38-43)";

}
else if (AgeClass == 6)
{
    AgeString = "(48-53)";

}
else if (AgeClass == 7)
{
    AgeString = "(60- )";

}

label1.Text = AgeString;    //show class
label2.Text = AgeConfidence.ToString();    //show confidence
}

```



8、Run it ,can see results.

