OpenCV for Unity 2.3.4

WebGL support
iOS & **Android** support
Windows10 UWP support
Win & **Mac** & **Linux** Standalone support
Support for preview in the **Editor**
Work with Unity Free & Pro

System Requirements
Build Win Standalone & Preview Editor : Windows8 or later
Build Mac Standalone & Preview Editor : OSX 10.9 or later

OpenCV for Unity is an Assets Plugin for using **OpenCV** from within **Unity**.

- Since this package is **a clone of OpenCV Java**, you are able to use the same API as OpenCV Java 4.0.0(git: opencv,opencv-contrib).
- You can image processing in **real-time** by using the **WebCamTexture** capabilities of Unity. **(real-time face detection works smoothly on iPhone 5)**
- Provides a method to interconversion of **Unity's Texture2D** and **OpenCV's Mat**.
- **IDisposable** is implemented in many classes.You can manage the resources with the "**using**" statement.
- **Examples of integration with other publisher assets** are available. （e.g. PlayMaker, NatCam, NatCorder)

Official Site | ExampleCode | Android Demo WebGL Demo | Tutorial & Demo Video | Forum | API Reference | Support Modules

Please refer to OpenCV official document for the details of the argument of the method.

OpenCV for Unity uses **OpenCV** under **3-clause BSD License**; see Third-Party Notices.txt file in package for details

Example code using OpenCV for Unity is available.

- MarkerBased AR Example
- MarkerLess AR Example
- FaceTracker Example
- FaceSwapper Example
- FaceMask Example
- RealTime FaceRecognition Example
- GoogleVRWithOpenCVForUnityExample
- Voforia with OpenCV for Unity Example
- Kinect with OpenCV for Unity Example
- AVPro with OpenCV for Unity Example
- HoloLens with OpenCV for Unity Example
- PlayMakerActions for OpenCVforUnity
- NatCam with OpenCVForUnity Example

- NatCorder with OpenCVForUnity Example
- MagicLeapWithOpenCVForUnityExample

Version changes
2.3.4 [Common]Added MaskRCNNExample. [WebGL]Added Unity2019.1 or later support.
2.3.3 [Common]Updated to OpenCV4.0.0. [Common]Re-assined namespace as was classified by module names. [Common]Updated to WebCamTextureToMatHelper.cs v1.1.0. [Common]Updated to ImageOptimizationHelper v1.1.0 [Common] Added Utils_GetFilePathExample, FaceMarkExample and QRCodeDetectorExample.
2.3.2 [macOS]Removed 32bit architecture(i386) from opencvforuntiy.bundle.
2.3.1 [Common]Updated to OpenCV3.4.2. [Android,UWP]Fixed Utils.setDebugMode() method on the IL2CPP backend. [Common]Added DnnObjectDetectionExample and DnnObjectDetectionWebCamTextureExample.
2.3.0 [iOS]Added a function to automatically remove the simulator architecture(i386,x86_64) at build time. [Common] Improved OpenCVForUnityMenuItem.setPluginImportSettings() method.
2.2.9 [Linux]Simplified the Linux platform setup procedure. [Common]Added support for Utils. setDebugMode() method on all platforms. [Common]Updated to WebCamTextureToMatHelper.cs v1.0.9. [Common]Added MatToTextureInRenderThreadExample and AlphaBlendingExample.
2.2.8 [Common]Updated to WebCamTextureToMatHelper.cs v1.0.7. [Common]Added MatBasicProcessingExample. [Common]Fixed WebCamTextureToMatExample, WebCamTextureToMatHelperExample, ArUcoExample. [Common]Added flip flag to Utils.fastMatToTexture2D() method and Utils.fastTexture2DToMat() method. [Common]Added throwException flag to Utils.setDebugMode() method.
2.2.7 [Common]Updated to OpenCV3.4.1. [Common]Added OpenPoseExample(The model file is not included in this asset.), KalmanFilterExample, ArUcoCameraCalibrationExample. [Common]Fixed VideoWriterExample, VideoCaptureExample, ImwriteScreenCaptureExample, CamShiftExample, TrackingExample, HandPoseEstimationExample, ArUcoCreateMarkerExample, ArUcoExample, ArUcoWebCamTextureExample. [Common] Updated to WebCamTextureToMatHelper.cs v1.0.6.
2.2.6 [Android]Added arm64-v8a Architecture. [Common]Added ImwriteScreenCaptureExample.
2.2.5 [Common] Updated to WebCamTextureToMatHelper.cs v1.0.4. [Common] Fixed MobileNetSSDExample and MobileNetSSDWebCamTextureExample.
2.2.4 [Common]Updated to OpenCV3.3.1. [Common]Added ResnetSSDFaceDetectionExample, YoloObjectDetectionExample, YoloObjectDetectionWebCamTextureExample.
2.2.3 [Common]Updated to WebCamTextureToMatHelper.cs v1.0.3. [iOS] opencv2.framework is changed from static framework to embededd framework. (Target minimum iOS Version must be set to 8.0 or higher.)
2.2.2 [Common]Added TextRecognitionExample.
2.2.1 [Common]Updated to OpenCV3.3.0. [Common]Added dnn module.(win,mac,ios,android platform) [Common]Added img_hash, reg, text module.(all platform) [Common]Added MobileNetSSDExample, MobileNetSSDWebCamTextureExample, TensorFlowWebCamTextureExample, ThinPlateSplineShapeTransformerExample, TextDetectionExample, VideoWriterExample. [Common]WindowsStoreApp8.1 & WindowsPhone8.1 support have been deprecated.

2.2.0 [Common]Updated WebCamTextureToMatHelper.cs v1.0.2 [Common]Improved Utils.getFilePathAsync().

2.1.9 [WebGL]Fixed Utils.getFilePathAsync() method.

2.1.8 [Common]Added PCAExample. [Common]Updated WebCamTextureToMatHelper.cs and OptimizationWebCamTextureToMatHelper.cs(Changed several method names.).

2.1.7 [Common]Improved Utils.getFilePath() and Utils.getFilePathAsync(). [Common]Improved WebCamTextureAsyncDetectFaceExample.cs. [Common] Fixed the const value of Calib3d class.

2.1.6 [Common]Fixed fastMatToTexture2D() method.

2.1.5 [Common]Updated to OpenCV3.2.0. [Common]Added fuzzy, phase_unwrapping, saliency, shape, tracking module. [Common]Added TrackingSample. [iOS]Added ios_exclude_contrib.zip for build size reduction. [Android]Added android_exclude_contrib.zip for build size reduction.

2.1.4 [Common]Changed the scene name.("Sample" to "Example") [Common]Fixed ArUcoTexture2DExample and ArUcoWebCamTextureExample. [Common]Added ConnectedComponentsExample. [Common]Added GreenScreenExample.

2.1.3 [UWP]Added OpenCVForUnityUWP_Beta3.zip.

2.1.2 [Common]Fixed WebCamTextureToMatHelper.cs.(flipVertical and flipHorizontal flag)

2.1.1 [Common]Fixed OpenCVForUnityMenuItem.cs.(No valid name for platform: 11 Error) [Common]Added Utils.textureToTexture2D() method. [Common]Added Mat class operators. [Common]Added PolygonFilterSample.

2.1.0 [Common]Fixed WebCamTextureToMatHelper class. [Common]Added Utils.getVersion(). [Common]Fixed Utils.getFilePathAsync().

2.0.9 [WebGL]Added WebGL(beta) support.(Unity5.3 or later)

2.0.8 [Common]Improved WebCamTextureHelper class. [Common]Fixed ArUcoSample.

2.0.7 [Common]Added aruco, structured_light, xfeatures2d module. [Common]Added ArUcoSample, GrabCutSample, InpaintSample, MatchShapesSample, MSERSample.

2.0.6 [WSA]Fixed an issue where Windows App Certification Kit fails.

2.0.5 [Common]Added HOGDescriptorSample.

2.0.4 [Android]Added Support for Split Application Binary (.OBB) [Android]Removed opencvforunity.jar.

2.0.3 [Common]Added SVMSample. [Common]Fixed VideoCaptureSample and WebCamTextureAsyncDetectFaceSample. [UWP]Added OpenCVForUnityUWP_Beta2.zip.

2.0.2 [Common]Fixed CS0618 warnings: `UnityEngine.Application.LoadLevel(string)' is obsolete: `Use SceneManager.LoadScene'.

2.0.1 [OSX]Fixed SIGILL Exception. [Common]Added Utils.setDebugMode() method. [Common]Added MatchTemplateSample, StereoBMSample, SeamlessCloneSample and WebCamTextureDetectCirclesSample. [Common]Added flipVertical flag, flapHorizontal flag and GetWebCamDevice() method to WebCamTextureToMatHelper.cs.

2.0.0 [Common]Updated to OpenCV3.1.0. [Common]Included Old Version based on “OpenCV2.4.11”. [Common] Included Beta Version of Windows10 UWP Support.(This is beta version based on OpenCV3.0.0. opencv_contrib modules is not supported.)

Beta16 [iOS]Fixed libopencvforunity.a Bitcode Setting.

Beta15 [Common]Fixed WebCamTextureToMatHelper.cs.(Add didUpdateThisFrame () method)

Beta14 [Common]Fixed WebCamTextureToMatHelper.cs.(Bug of rotation convertion from WebCamTexture to Mat in Win,Mac StandAlone Build)

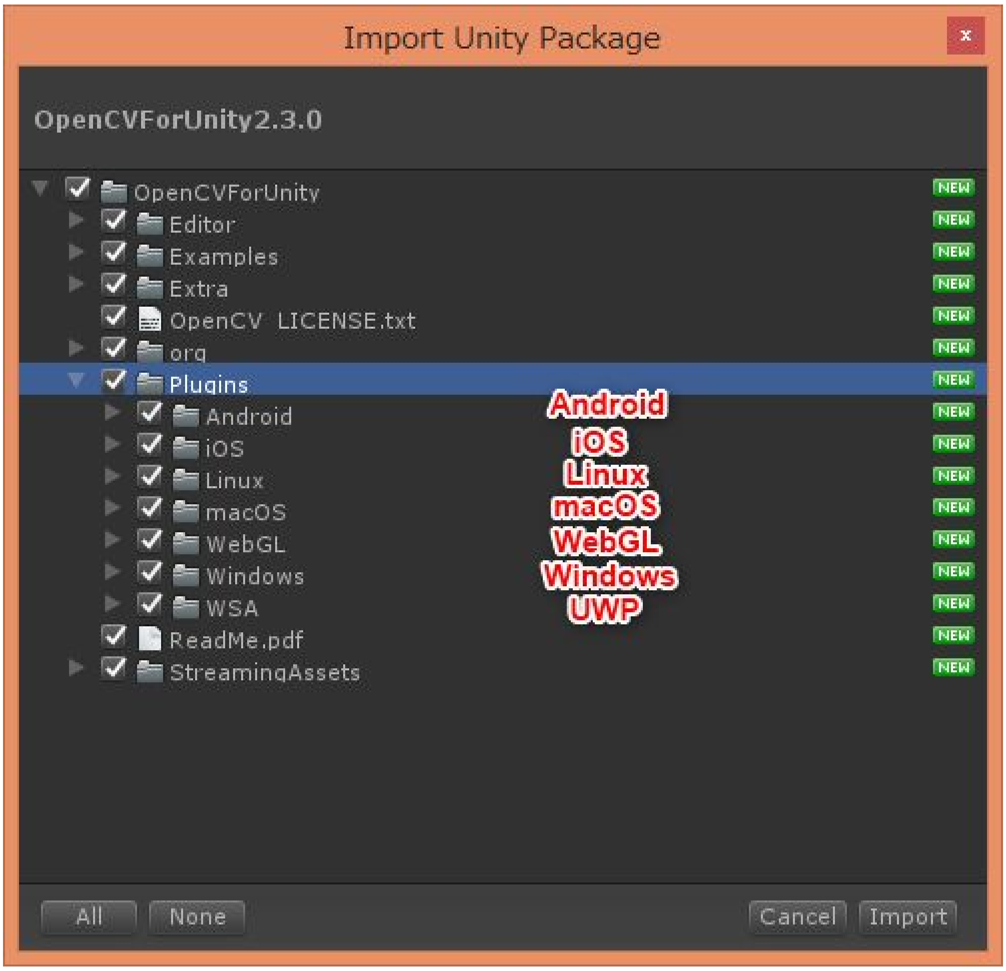
Beta13 [Common]Added fastTexture2DToMat() and fastMatToTexture2D(). [Common] Renewed the samples using WebCamTextureToMatHelper.(Supports all screen orientation.)

Beta12 [iOS]Fixed malloc_error that occurs in Unity5.3.1p2.

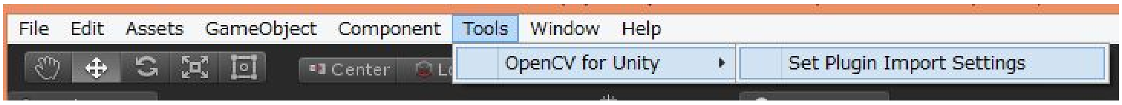
Beta11 [iOS]Enabled Jpeg format.(Added mjpeg format support in VideoCapture class)
Beta10 [iOS]Enabled Bitcode.
Beta9 [UWP]Added support for Windows10 UWP.(This is a test version. opencv_contrib modules is not supported.)
Beta8 [Common]Fix FaceRecognizerSample. [Common] Delete the method using Default parameter specifiers. [Android] Compile the library using "armabi-v7a with NEON" option.
Beta7 [Common]Add WrapPerspectiveSample, HandPoseEstimationSample.
Beta6 [iOS]Fix WebCamTexture bug of SampleScene in Unity5.2.
Beta5 [Linux]Add Linux Support. [WindowsStoreApp8.1]Support for methods using Low-level Native Plugin Interface. [Common]Rewrite SampleScene.
Beta4 [Common]Add Utils. getGraphicsDeviceType(). [Common]Add SampleScene Setup Tutorial Video for Unity5.
Beta3 [Common]Add CamShiftSample.(Object Tracking) [Common]Add OpenCVForUnityMenuItem.cs.(This script set plugin import settings automatically from MenuItem.)
Beta2 [iOS] Fix problem when working with Metaio(UnityAppController problem). [Common]Add [System.Serializable] to basic class. [Common] change folder name from "OpenCVForUnity/OpenCVForUnity_Editor/" to "OpenCVForUnity/Editor/". [iOS]Move "OpenCVForUnity/OpenCVForUnity_Editor/opencv2.framework" to "OpenCVForUnity/Plugins/iOS"folder.

Quick setup procedure to run the example scenes (Setup Tutorial Video)

1. Import the OpenCVForUnity.package. You do not need to import plug-in files for platforms not supported by your project. **If there is a previous version of OpenCVForUnity in the project, please delete the OpenCVForUnity folder first and then import the new version.**



2. Select MenuItem[Tools/OpenCV for Unity/Set Plugin Import Settings].

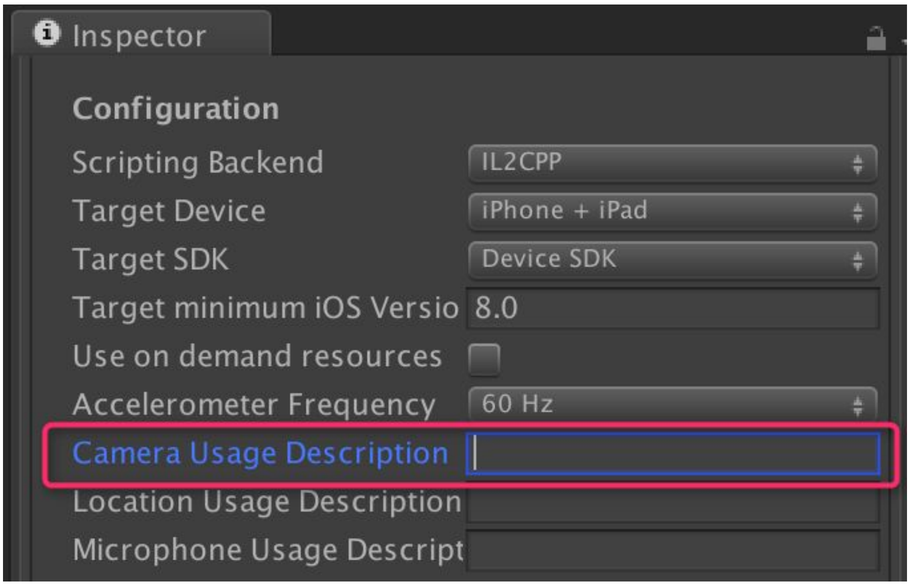


3. Move the “OpenCVForUnity/StreamingAssets/” folder to the “Assets/” folder.
   - Additional Setup for MobileNetSSDExample or MobileNetSSDWebCamTextureExample : Download https://github.com/chuanqi305/MobileNet-SSD/blob/master/images/004545.jpg. Copy 004545.jpg to “Assets/StreamingAssets/dnn/” folder. Download https://drive.google.com/file/d/0B3gersZ2cHIxRm5PMWRoTkdHdHc/view. Copy MobileNetSSD_deploy.caffemodel to “Assets/StreamingAssets/dnn/” folder. Downlod https://raw.githubusercontent.com/chuanqi305/MobileNet-SSD/master/MobileNetSSD_deploy.prototxt. Copy MobileNetSSD_deploy.prototxt to “Assets/StreamingAssets/dnn/” folder.
   - Additional Setup for OpenPoseExample : Downlod

https://github.com/CMU-Perceptual-Computing-Lab/openpose/blob/master/examples/media/COCO_val2014_000000000589.jpg. Copy COCO_val2014_000000000589.jpg to “Assets/StreamingAssets/dnn/” folder. Downlod http://posefs1.perception.cs.cmu.edu/OpenPose/models/pose/mpi/pose_iter_160000.caffemodel. Copy pose_iter_160000.caffemodel to “Assets/StreamingAssets/dnn/” folder. Download https://raw.githubusercontent.com/opencv/opencv_extra/master/testdata/dnn/openpose_pose_mpi_faster_4_stages.prototxt. Copy openpose_pose_mpi_faster_4_stages.prototxt to “Assets/StreamingAssets/dnn/” folder.

- Additional Setup for ResnetSSDFaceDetectionExample : Downlod https://raw.githubusercontent.com/opencv/opencv_3rdparty/b2bfc75f6aea5b1f834ff0f0b865a7c18ff1459f/res10_300x300_ssd_iter_140000.caffemodel. Copy res10_300x300_ssd_iter_140000.caffemodel to “Assets/StreamingAssets/dnn/” folder. Downlod https://raw.githubusercontent.com/opencv/opencv/master/samples/dnn/face_detector/deploy.prototxt. Copy deploy.prototxt to “Assets/StreamingAssets/dnn/” folder.
- Additional Setup for MaskRCNNExample : Downlod https://github.com/chuanqi305/MobileNet-SSD/blob/master/images/004545.jpg. Copy 004545.jpg to “Assets/StreamingAssets/dnn/” folder. Downlod and unzip http://download.tensorflow.org/models/object_detection/mask_rcnn_inception_v2_coco_2018_01_28.tar.gz. Copy mask_rcnn_inception_v2_coco_2018_01_28.pb to “Assets/StreamingAssets/dnn/” folder. Download https://raw.githubusercontent.com/opencv/opencv_extra/master/testdata/dnn/mask_rcnn_inception_v2_coco_2018_01_28.pbtxt. Copy mask_rcnn_inception_v2_coco_2018_01_28.pbtxt to “Assets/StreamingAssets/dnn/” folder. Download https://raw.githubusercontent.com/spmallick/learnopencv/master/Mask-RCNN/mscoco_labels.names. Copy mscoco_labels.names to “Assets/StreamingAssets/dnn/” folder.
- Additional Setup for TensorFlowWebCamTextureExample : Downlod and unzip https://storage.googleapis.com/download.tensorflow.org/models/inception5h.zip. Copy tensorflow_inception_graph.pb and imagenet_comp_graph_label_strings.txt to “Assets/StreamingAssets/dnn/” folder.
- Additional Setup for YoloObjectDetectionExample or YoloObjectDetectionWebCamTextureExample : Downlod https://github.com/pjreddie/darknet/blob/master/data/person.jpg. Copy person.jpg to “Assets/StreamingAssets/dnn/” folder. Downlod https://raw.githubusercontent.com/pjreddie/darknet/master/cfg/yolov3-tiny.cfg. Copy yolov3-tiny.cfg to “Assets/StreamingAssets/dnn/” folder. Downlod https://pjreddie.com/media/files/yolov3-tiny.weights. Copy yolov3-tiny.weights to “Assets/StreamingAssets/dnn/” folder. Downlod https://github.com/pjreddie/darknet/tree/master/data/coco.names. Copy coco.names to “Assets/StreamingAssets/dnn/” folder.
- Additional Setup for FaceMarkExample : Downlod https://github.com/spmallick/GSOC2017/blob/master/data/lbfmodel.yaml. Copy lbfmodel.yaml to “Assets/StreamingAssets/facemark/” folder.

4. **[iOS]** Set [PlayerSettings]-[Other Settings]-[Configuration]-[Camera Usage Description].



Inspector

Configuration

Scripting Backend: IL2CPP

Target Device: iPhone + iPad

Target SDK: Device SDK

Target minimum iOS Versio: 8.0

Use on demand resources: □

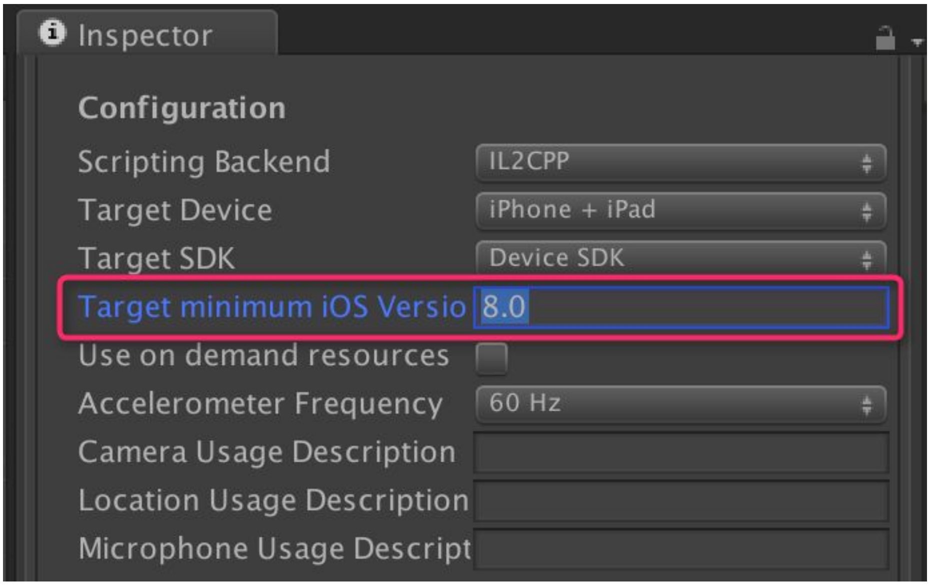
Accelerometer Frequency: 60 Hz

Camera Usage Description:

Location Usage Description:

Microphone Usage Descript:

Set Target minimum iOS Version to 8.0 or higher.



Inspector

Configuration

Scripting Backend: IL2CPP

Target Device: iPhone + iPad

Target SDK: Device SDK

Target minimum iOS Versio: 8.0

Use on demand resources: □

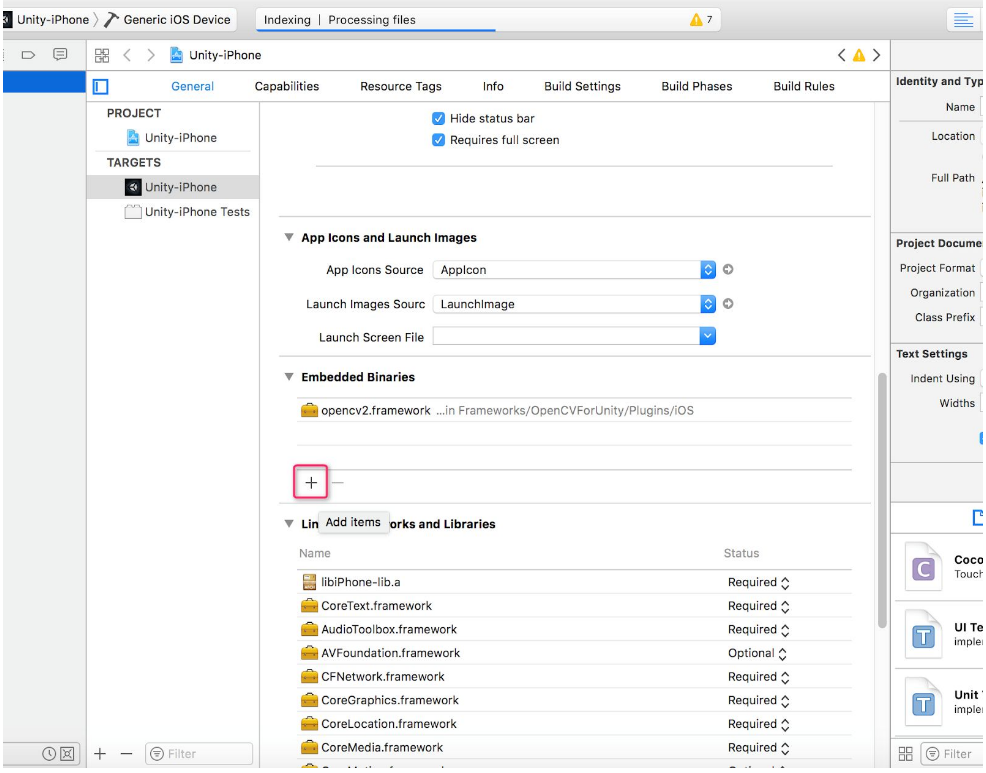
Accelerometer Frequency: 60 Hz

Camera Usage Description:

Location Usage Description:

Microphone Usage Descript:

If the version of Unity is less than 2017.2, you have to set opencv2.framework to Embedded Binaries manually.



☑ Hide status bar

☑ Requires full screen

App Icons and Launch Images

App Icons Source: AppIcon

Launch Images Sourc: LaunchImage

Launch Screen File:

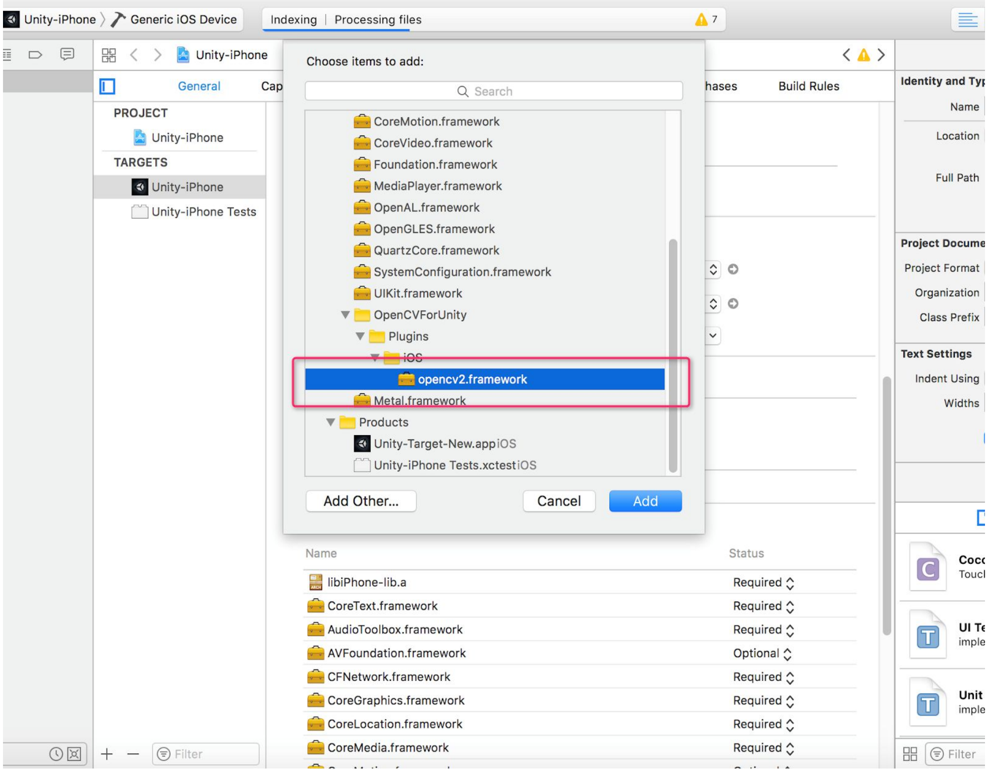
Embedded Binaries

opencv2.framework ...in Frameworks/OpenCVForUnity/Plugins/iOS

+ –

Lin orks and Libraries

Name	Status
libiPhone-lib.a	Required ◇
CoreText.framework	Required ◇
AudioToolbox.framework	Required ◇
AVFoundation.framework	Optional ◇
CFNetwork.framework	Required ◇
CoreGraphics.framework	Required ◇
CoreLocation.framework	Required ◇
CoreMedia.framework	Required ◇



Choose items to add:

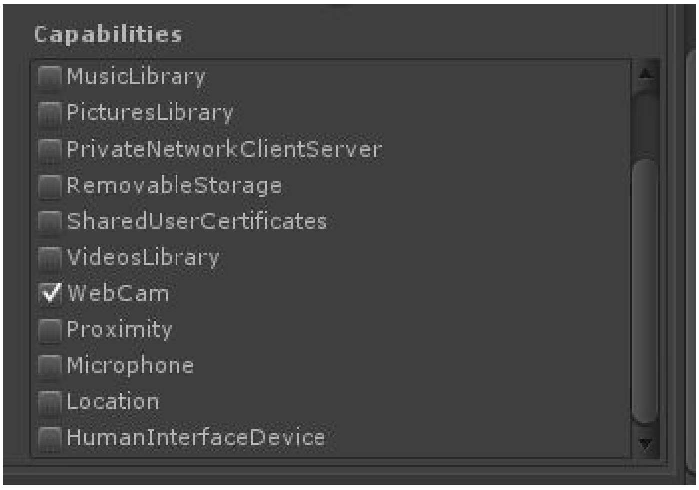
Search

CoreMotion.framework
CoreVideo.framework
Foundation.framework
MediaPlayer.framework
OpenAL.framework
OpenGLES.framework
QuartzCore.framework
SystemConfiguration.framework
UIKit.framework
OpenCVForUnity
Plugins
iOS
opencv2.framework
Metal.framework
Products
Unity-Target-New.app iOS
Unity-iPhone Tests.xctest iOS

Add Other... Cancel Add

Name	Status
libiPhone-lib.a	Required ◇
CoreText.framework	Required ◇
AudioToolbox.framework	Required ◇
AVFoundation.framework	Optional ◇
CFNetwork.framework	Required ◇
CoreGraphics.framework	Required ◇
CoreLocation.framework	Required ◇
CoreMedia.framework	Required ◇

5. **[Windows10 UWP]** If use webCamTextue class, Please choose “WebCam” in [PlayerSettings]-[PublishingSettings]-[Capabilities].

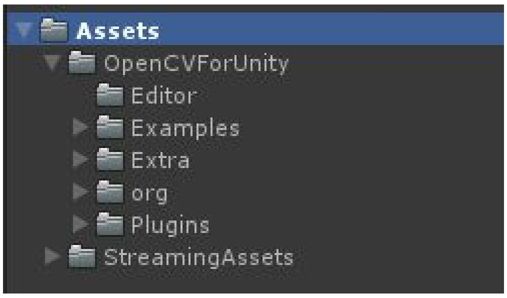


Capabilities

☐ MusicLibrary
☐ PicturesLibrary
☐ PrivateNetworkClientServer
☐ RemovableStorage
☐ SharedUserCertificates
☐ VideosLibrary
☑ WebCam
☐ Proximity
☐ Microphone
☐ Location
☐ HumanInterfaceDevice

6. Add all of the "***.unity" in the "OpenCVForUnity/Examples" folder to [Build Settings] – [Scene In Build].

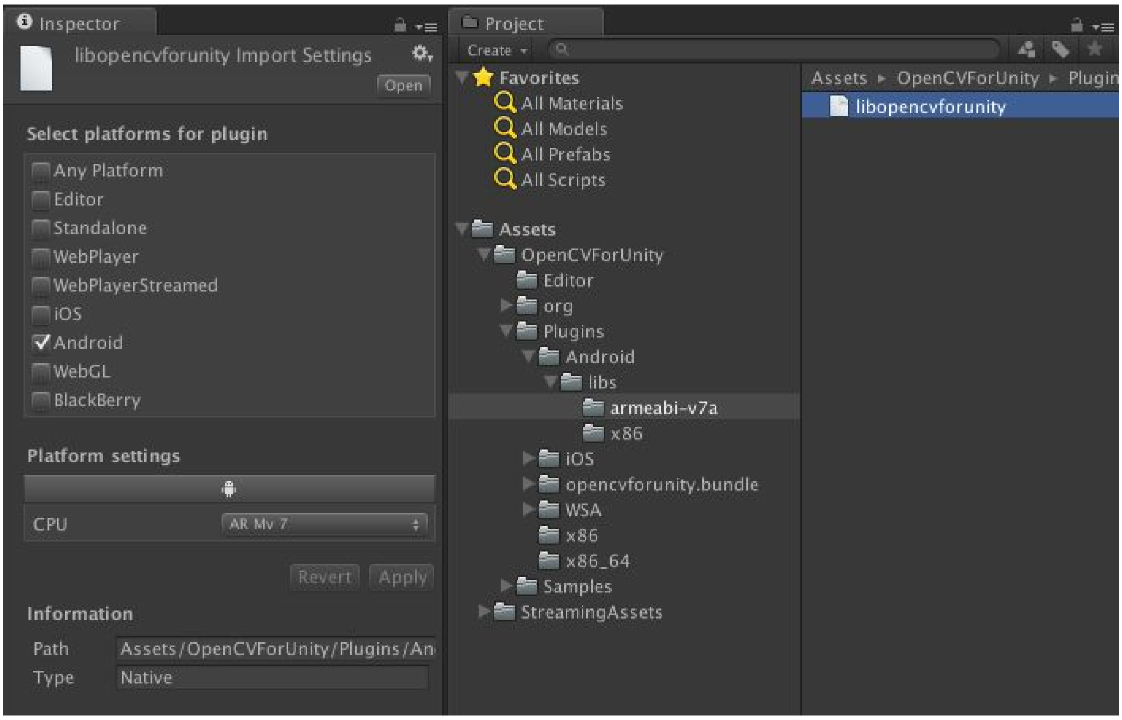
Screenshot after the setup



```
▼ Assets
  ▼ OpenCVForUnity
      Editor
    ▶ Examples
    ▶ Extra
    ▶ org
    ▶ Plugins
  ▶ StreamingAssets
```

Android Setup Procedure

- “OpenCVForUnity/Plugins/libs/armeabi-v7a/*.so” – Select platform Android and CPU ARMv7 in Inspector.



libopencvforunity Import Settings

Select platforms for plugin

☐ Any Platform
☐ Editor
☐ Standalone
☐ WebPlayer
☐ WebPlayerStreamed
☐ iOS
☑ Android
☐ WebGL
☐ BlackBerry

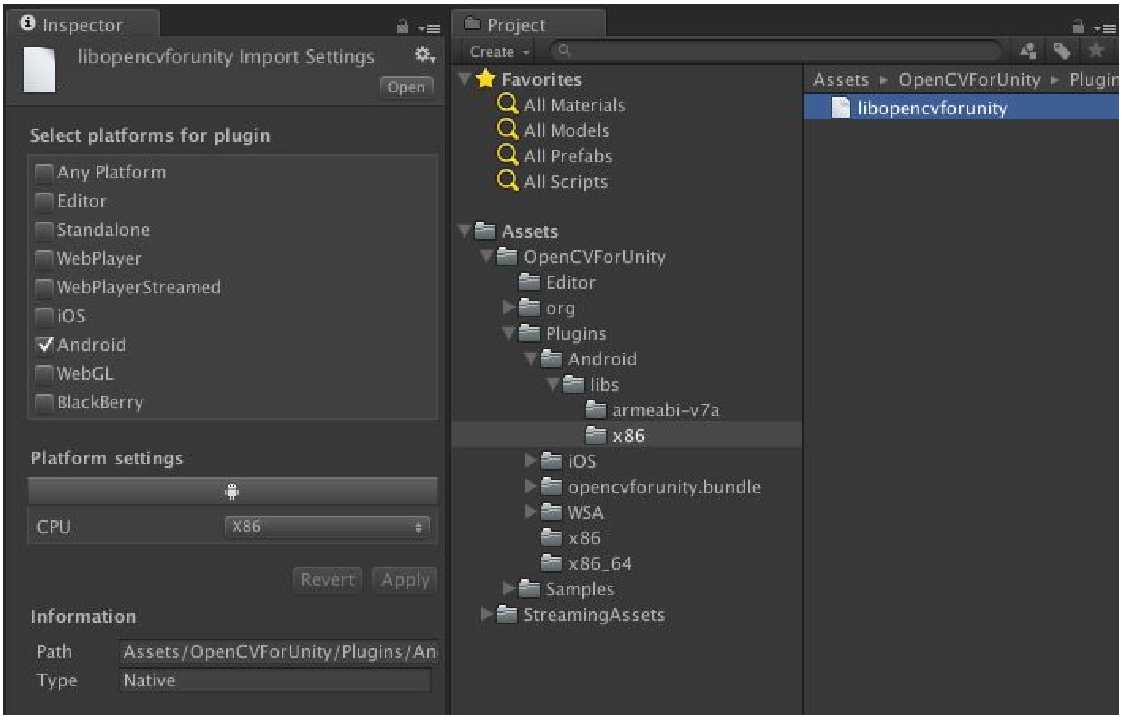
Platform settings

CPU: ARMv7

Information

Path: Assets/OpenCVForUnity/Plugins/An
Type: Native

- “OpenCVForUnity/Plugins/libs/x86/*.so” – Select platform Android and CPU x86 in Inspector.



libopencvforunity Import Settings

Select platforms for plugin

☐ Any Platform
☐ Editor
☐ Standalone
☐ WebPlayer
☐ WebPlayerStreamed
☐ iOS
☑ Android
☐ WebGL
☐ BlackBerry

Platform settings

CPU: X86

Information

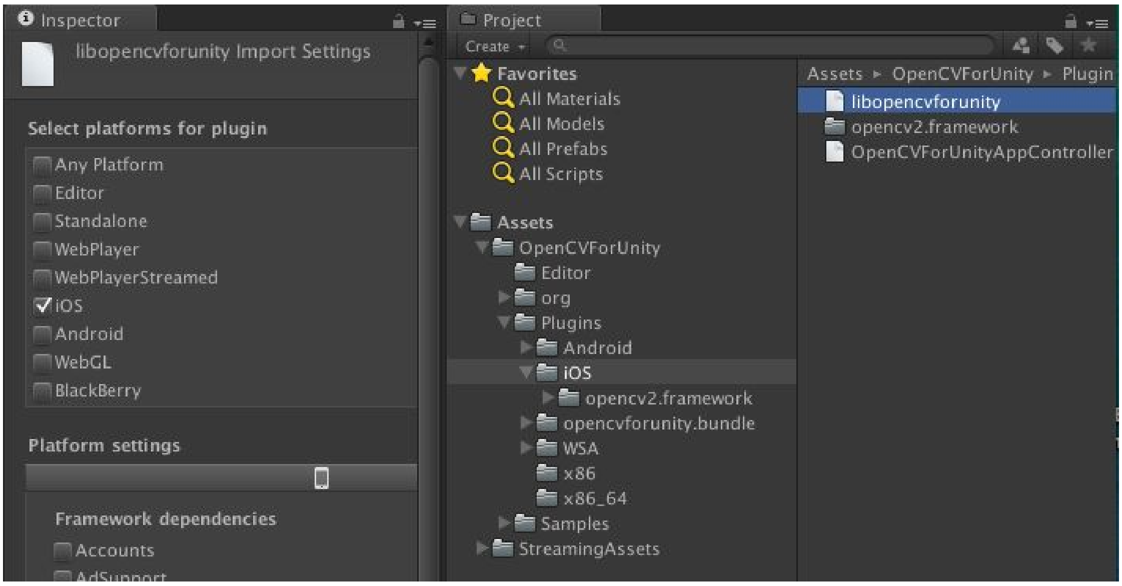
Path: Assets/OpenCVForUnity/Plugins/An
Type: Native

- If you do not use opencv_contrib module, build size will be reduced by using native plugin file excluding opencv_contrib module.

1. Replace the OpenCVForUnity/Plugins/Android/libs folder to the OpenCVForUnity/Extra/exclude_contrib/Android/libs folder.
2. Select MenuItem[Tools/OpenCV for Unity/Set Plugin Import Settings].
3. Delete the OpenCVForUnity/Assets/OpenCVForUnity/org/opencv_contrib folder and the OpenCVForUnity/Examples/ContribModules folder.

iOS Setup Procedure

- "OpenCVForUnity/Plugins/iOS/libopencvforunity.a" – Select platform iOS in Inspector.



libopencvforunity Import Settings

Select platforms for plugin

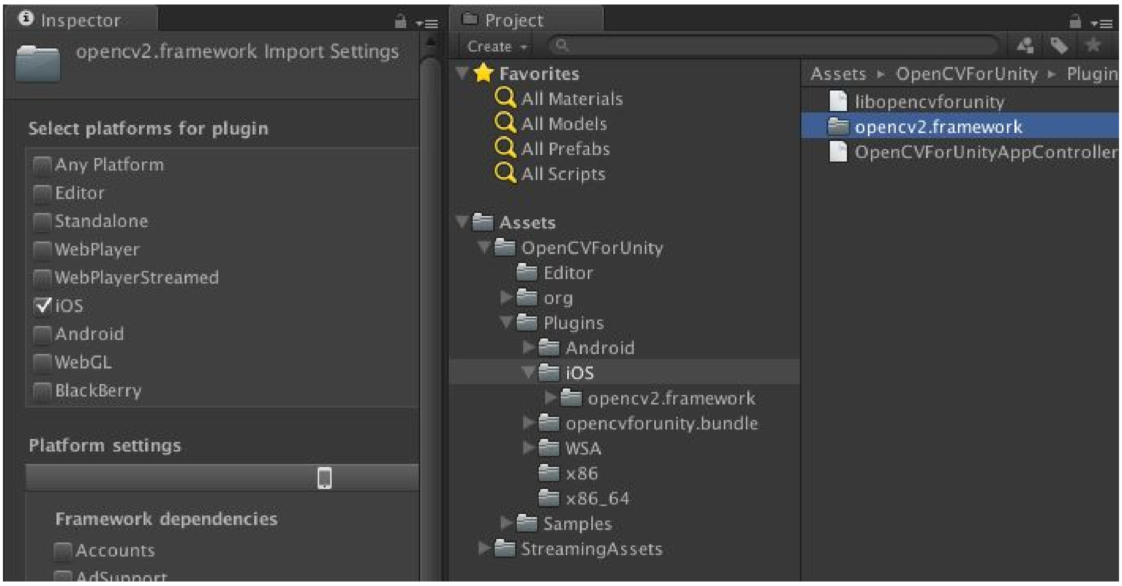
□ Any Platform
□ Editor
□ Standalone
□ WebPlayer
□ WebPlayerStreamed
☑ iOS
□ Android
□ WebGL
□ BlackBerry

Platform settings

Framework dependencies

□ Accounts
□ AdSupport

- "OpenCVForUnity/Plugins/iOS/opencv2.framework" – Select platform iOS in Inspector.



opencv2.framework Import Settings

Select platforms for plugin

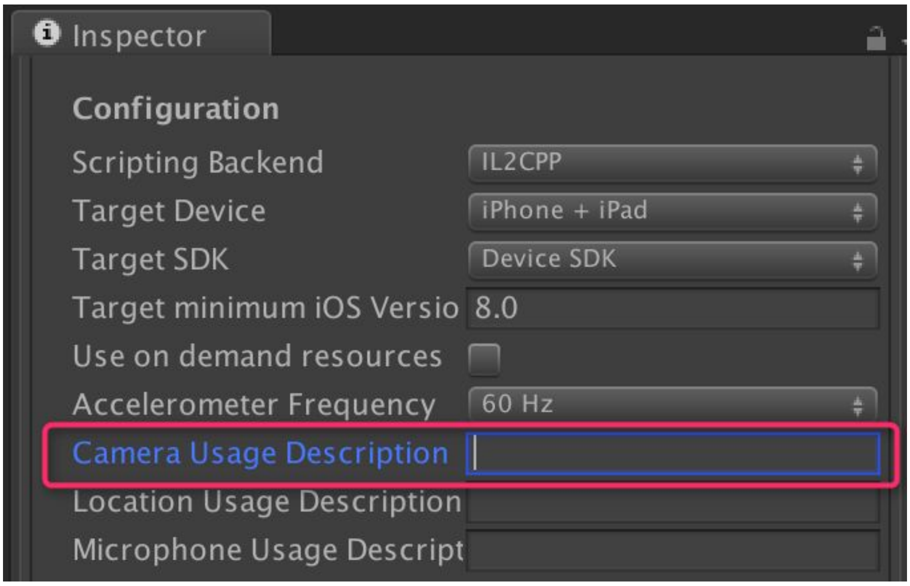
□ Any Platform
□ Editor
□ Standalone
□ WebPlayer
□ WebPlayerStreamed
☑ iOS
□ Android
□ WebGL
□ BlackBerry

Platform settings

Framework dependencies

□ Accounts
□ AdSupport

- If iOS platform, Set [PlayerSettings]-[Other Settings]-[Configuration]-[Camera Usage Description].



Inspector

Configuration

Scripting Backend: IL2CPP

Target Device: iPhone + iPad

Target SDK: Device SDK

Target minimum iOS Versio: 8.0

Use on demand resources: □

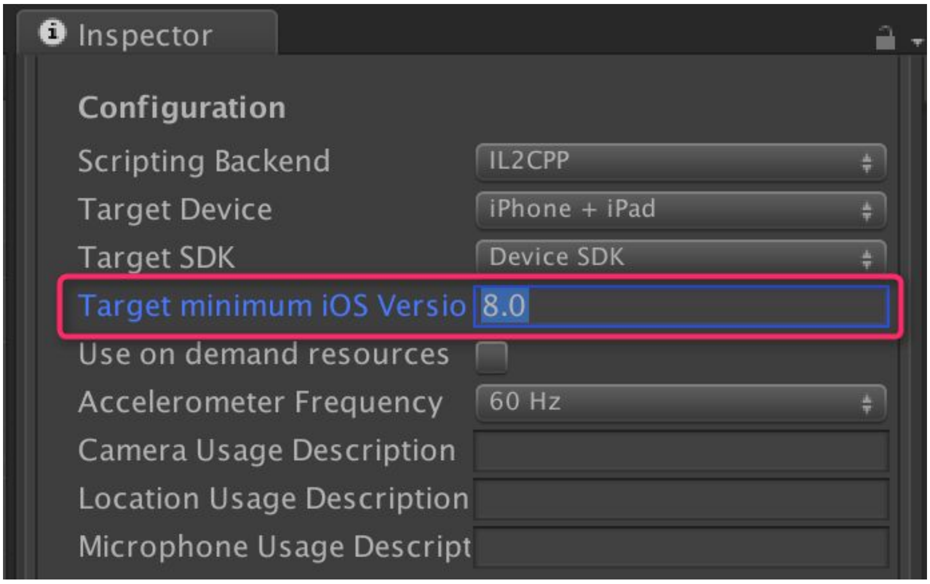
Accelerometer Frequency: 60 Hz

Camera Usage Description:

Location Usage Description:

Microphone Usage Descript:

- Set Target minimum iOS Version to 8.0 or higher.



Inspector

Configuration

Scripting Backend: IL2CPP

Target Device: iPhone + iPad

Target SDK: Device SDK

Target minimum iOS Versio: 8.0

Use on demand resources: □

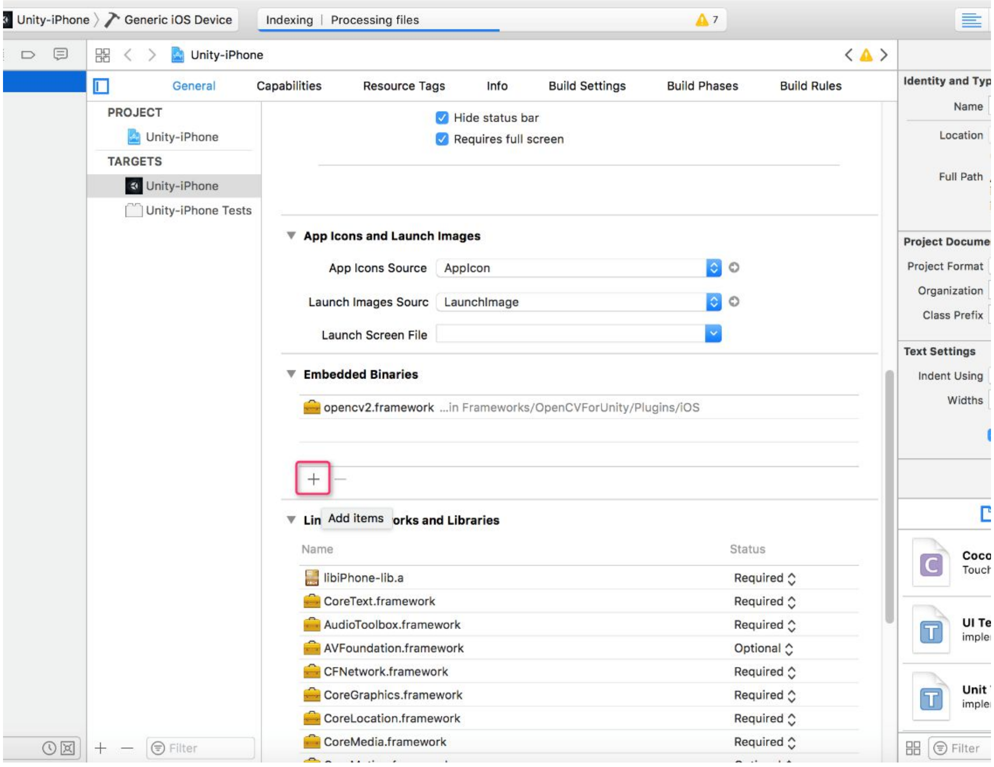
Accelerometer Frequency: 60 Hz

Camera Usage Description:

Location Usage Description:

Microphone Usage Descript:

- If the version of Unity is less than 2017.2, you have to set opencv2.framework to Embedded Binaries manually.



☑ Hide status bar
☑ Requires full screen

App Icons and Launch Images

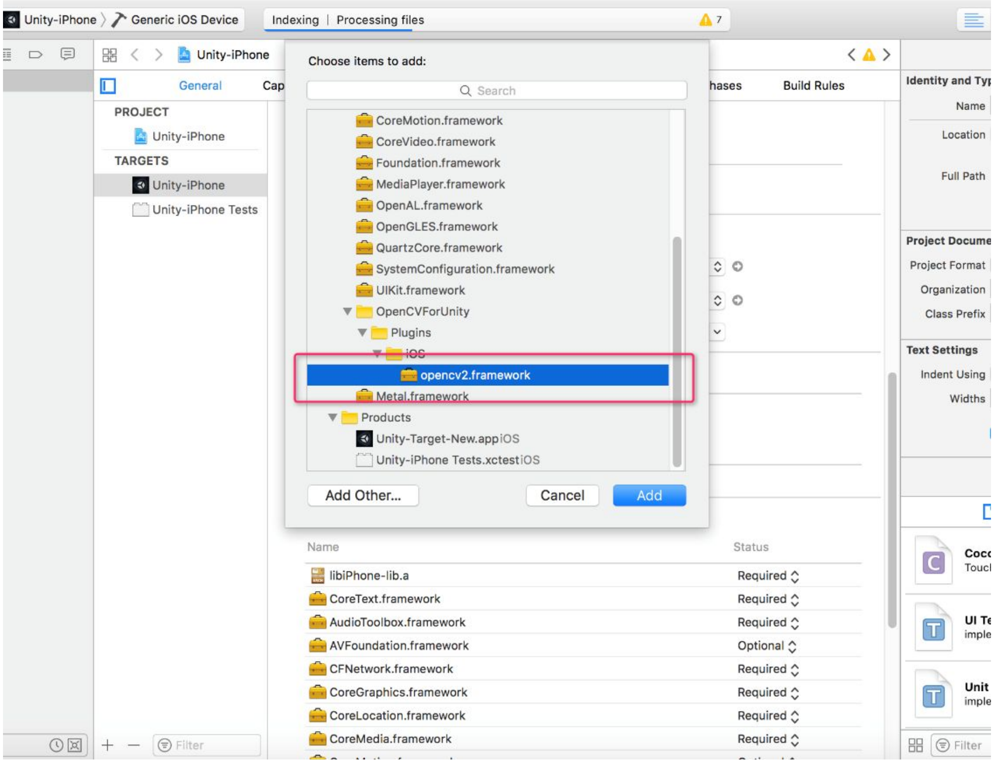
App Icons Source: AppIcon
Launch Images Sourc: LaunchImage
Launch Screen File:

Embedded Binaries

opencv2.framework ...in Frameworks/OpenCVForUnity/Plugins/iOS

Lin[ked Framew]orks and Libraries

Name	Status
libiPhone-lib.a	Required
CoreText.framework	Required
AudioToolbox.framework	Required
AVFoundation.framework	Optional
CFNetwork.framework	Required
CoreGraphics.framework	Required
CoreLocation.framework	Required
CoreMedia.framework	Required

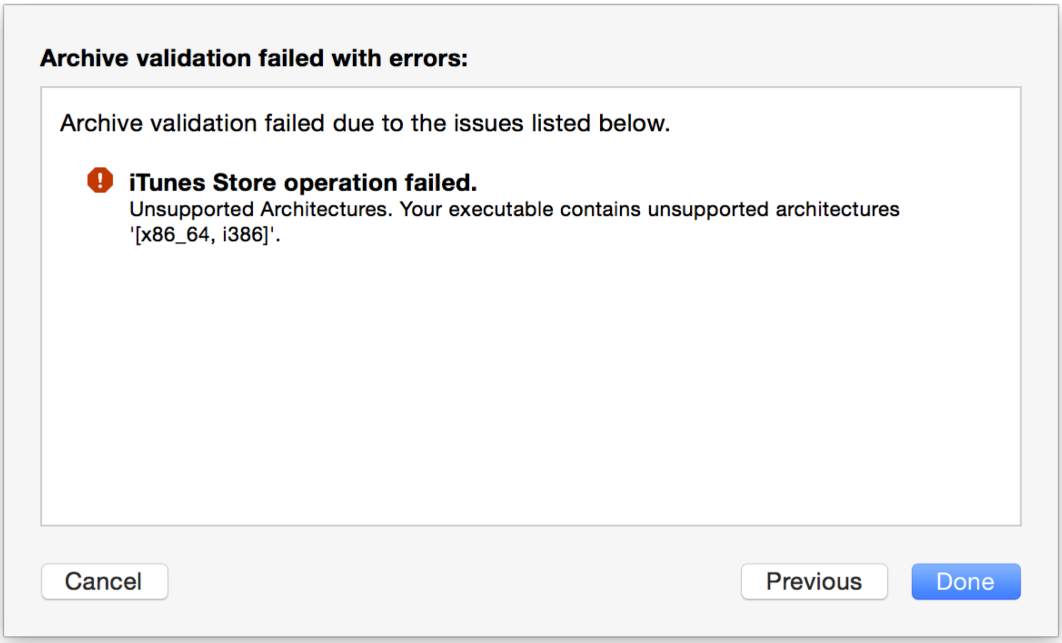


Choose items to add:

- CoreMotion.framework
- CoreVideo.framework
- Foundation.framework
- MediaPlayer.framework
- OpenAL.framework
- OpenGLES.framework
- QuartzCore.framework
- SystemConfiguration.framework
- UIKit.framework
- OpenCVForUnity
  - Plugins
    - iOS
      - opencv2.framework
- Metal.framework
- Products
  - Unity-Target-New.app iOS
  - Unity-iPhone Tests.xctest iOS

Name	Status
libiPhone-lib.a	Required
CoreText.framework	Required
AudioToolbox.framework	Required
AVFoundation.framework	Optional
CFNetwork.framework	Required
CoreGraphics.framework	Required
CoreLocation.framework	Required
CoreMedia.framework	Required

- When exporting ipa file, you need to remove the unneeded architectures from opencv2.framework, before submitting it.



Archive validation failed with errors:

Archive validation failed due to the issues listed below.

iTunes Store operation failed.
Unsupported Architectures. Your executable contains unsupported architectures '[x86_64, i386]'.

Please see Q & A No.9 for details.

- When "-ObjC" is set to "OTHER_LDFLAGS" by other Asset, the following error may occur.

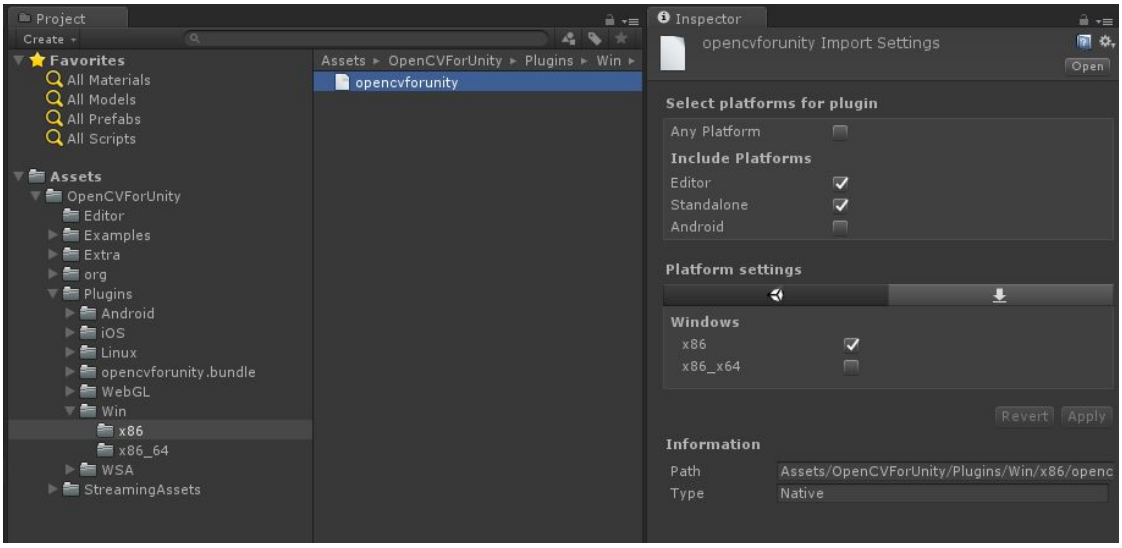
```
Undefined symbols for architecture armv7:

  "_OBJC_CLASS_$_ALAssetsLibrary", referenced from:

      objc-class-ref in opencv2(cap_ios_video_camera.o)

ld: symbol(s) not found for architecture armv7

clang: error: linker command failed with exit code 1 (use -v to see invocation)
```

In that case, add “proj.AddFrameworkToProject (target, "AssetsLibrary.framework", false);” to “Assets/OpenCVForUnity/Editor/iOS_BuildPostprocessor.cs”.

- If you do not use opencv_contrib module, build size will be reduced by using native plugin file excluding opencv_contrib module.
  1. Replace the OpenCVForUnity/Plugins/iOS folder to the OpenCVForUnity/Extra/exclude_contrib/iOS folder.
  2. Select MenuItem[Tools/OpenCV for Unity/Set Plugin Import Settings].
  3. Delete the OpenCVForUnity/Assets/OpenCVForUnity/org/opencv_contrib folder and the OpenCVForUnity/Examples/ContribModules folder.

Win Standalone Setup Procedure

- "OpenCVForUnity/Plugins/Windows/x86/opencvforunity.dll" – Select platform Editor,Standalone and CPU x86 and OS Windows in Inspector.



opencvforunity Import Settings

Select platforms for plugin

Any Platform ☐

Include Platforms

Editor ☑

Standalone ☑

Android ☐

Platform settings

Windows

x86 ☑

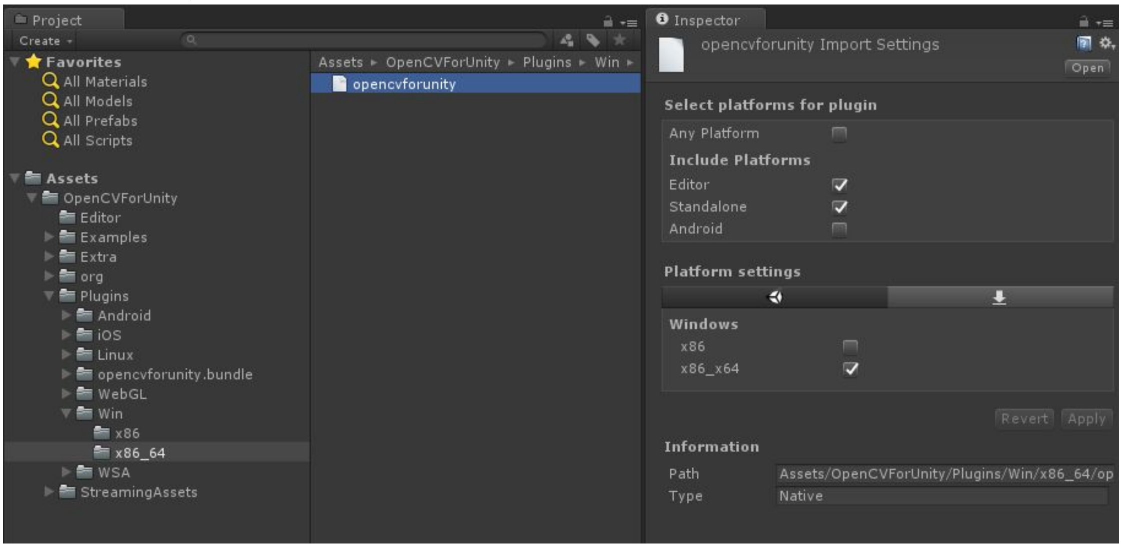
x86_x64 ☐

Information

Path Assets/OpenCVForUnity/Plugins/Win/x86/openc

Type Native

- "OpenCVForUnity/Plugins/Windows/x86_64/opencvforunity.dll" – Select platform Editor,Standalone and CPU x86_64 and OS Windows in Inspector.



opencvforunity Import Settings

Select platforms for plugin

Any Platform ☐

Include Platforms

Editor ☑

Standalone ☑

Android ☐

Platform settings

Windows

x86 ☐

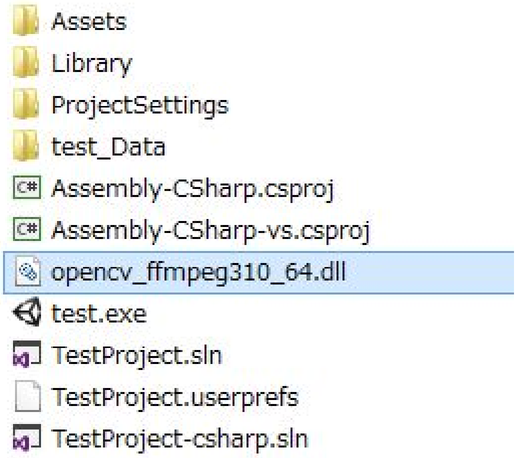
x86_x64 ☑

Information

Path Assets/OpenCVForUnity/Plugins/Win/x86_64/op

Type Native

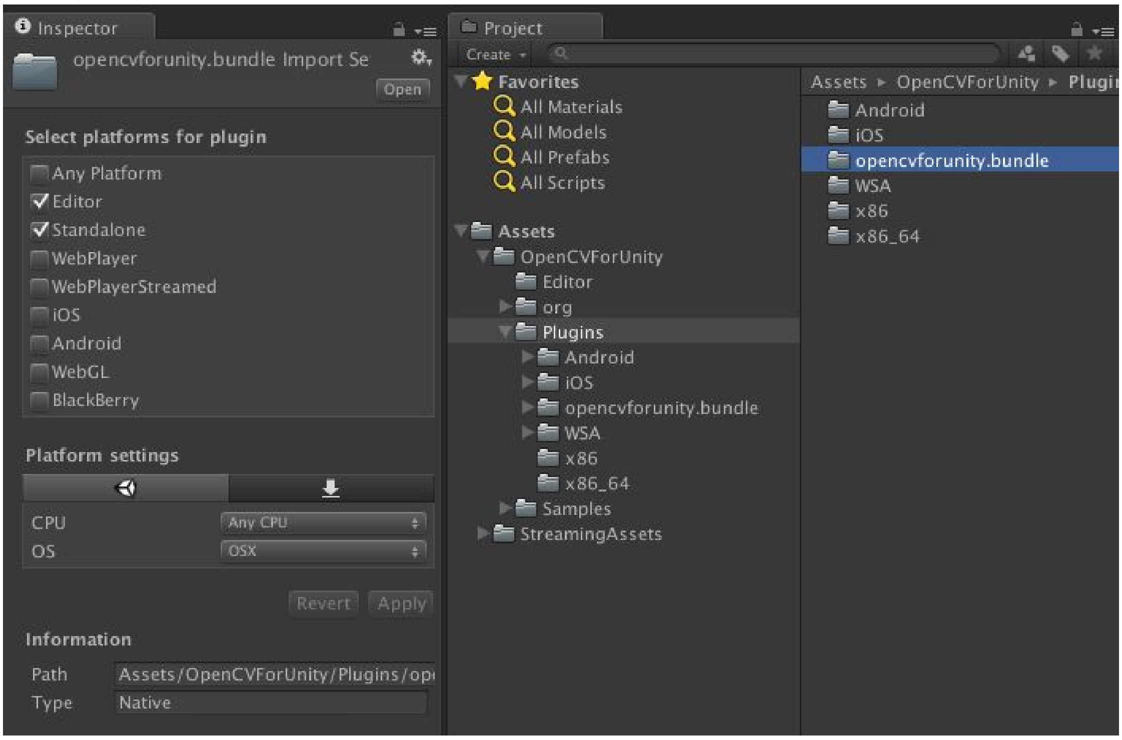
- If you want to use more video formats with the "Video Capture (string filename)" or "VideoWriter" method, setup is required.
  1)Download "OpenCV for Windows Version 4.0.0"(http://opencv.org/downloads.html).
  2)Set PATH variable to "opencv_ffmpeg4.0.0.dll" or "opencv_ffmpeg4.0.0_64.dll".
  if 32bit, "\path\to\opencv\build\x86\vc14\bin\".
  if 64bit, "\path\to\opencv\build\x64\vc14\bin\".
  Or
  2)Copy to Project Folder.



Assets
Library
ProjectSettings
test_Data
Assembly-CSharp.csproj
Assembly-CSharp-vs.csproj
opencv_ffmpeg310_64.dll
test.exe
TestProject.sln
TestProject.userprefs
TestProject-csharp.sln

Mac Standalone Setup Procedure

- "OpenCVForUnity/Plugins/macOS/opencvforunity.bundle" – Select platform Editor,Standalone and CPU x86_64 and OS OSX in Inspector.



opencvforunity.bundle Import Se

Select platforms for plugin

□ Any Platform
☑ Editor
☑ Standalone
□ WebPlayer
□ WebPlayerStreamed
□ iOS
□ Android
□ WebGL
□ BlackBerry

Platform settings

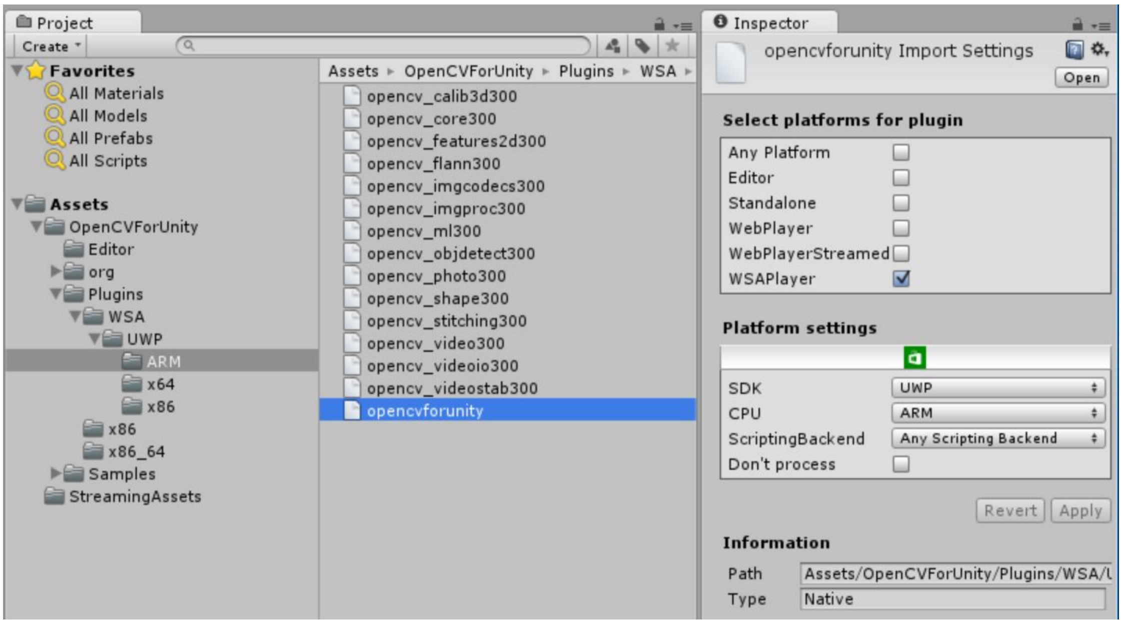
CPU: Any CPU
OS: OSX

Information

Path: Assets/OpenCVForUnity/Plugins/op
Type: Native

UWP Setup Procedure

- “OpenCVForUnity/Plugins/WSA/UWP/ARM/*.dll” – Select platform WSAPlayer and SDK81 and CPU ARM in Inspector. Set “x86” and ”x64” in the same way as “ARM”.



opencvforunity Import Settings

Select platforms for plugin

Any Platform	☐
Editor	☐
Standalone	☐
WebPlayer	☐
WebPlayerStreamed	☐
WSAPlayer	☑

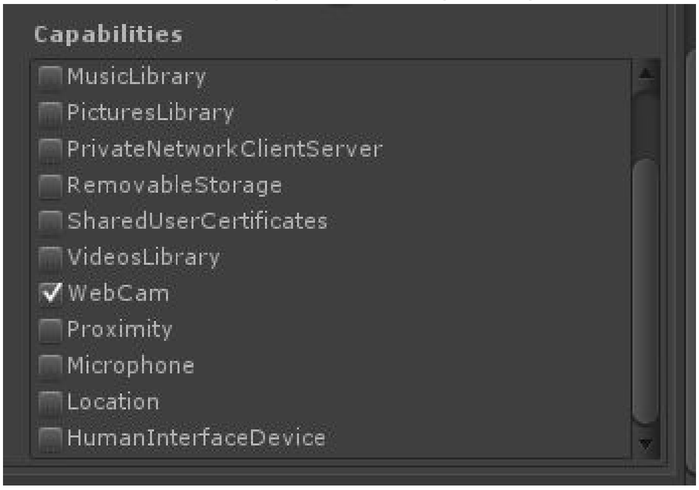
Platform settings

SDK	UWP
CPU	ARM
ScriptingBackend	Any Scripting Backend
Don't process	☐

Information

Path	Assets/OpenCVForUnity/Plugins/WSA/U
Type	Native

- If use webCamTextue class, Please choose “WebCam” in [PlayerSettings]-[PublishingSettings]-[Capabilities].

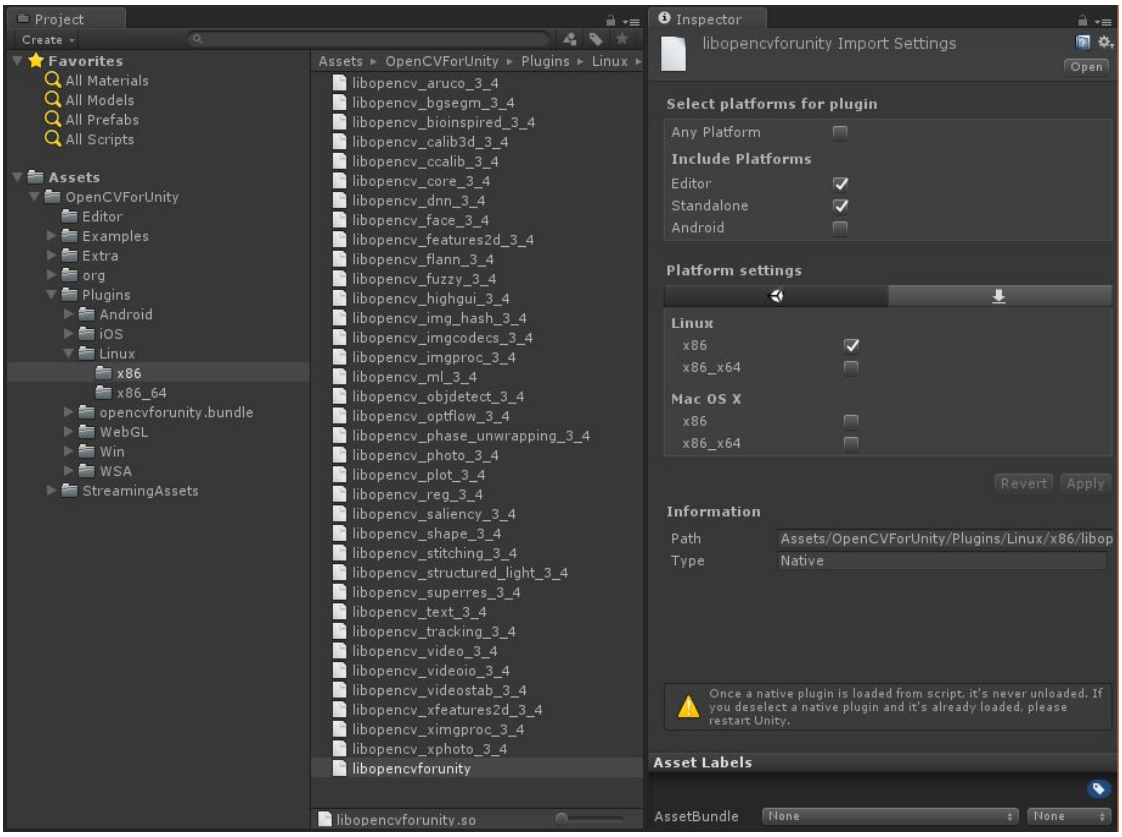


Capabilities

☐ MusicLibrary
☐ PicturesLibrary
☐ PrivateNetworkClientServer
☐ RemovableStorage
☐ SharedUserCertificates
☐ VideosLibrary
☑ WebCam
☐ Proximity
☐ Microphone
☐ Location
☐ HumanInterfaceDevice

Linux Setup Procedure

- “OpenCVForUnity/Plugins/Linux/x86/libopencvforunity.so” – Select platform Editor,Standalone and CPU x86 and OS Linux in Inspector.



libopencvforunity Import Settings

Select platforms for plugin

Any Platform □
Include Platforms
Editor ☑
Standalone ☑
Android □

Platform settings

Linux
x86 ☑
x86_x64 □

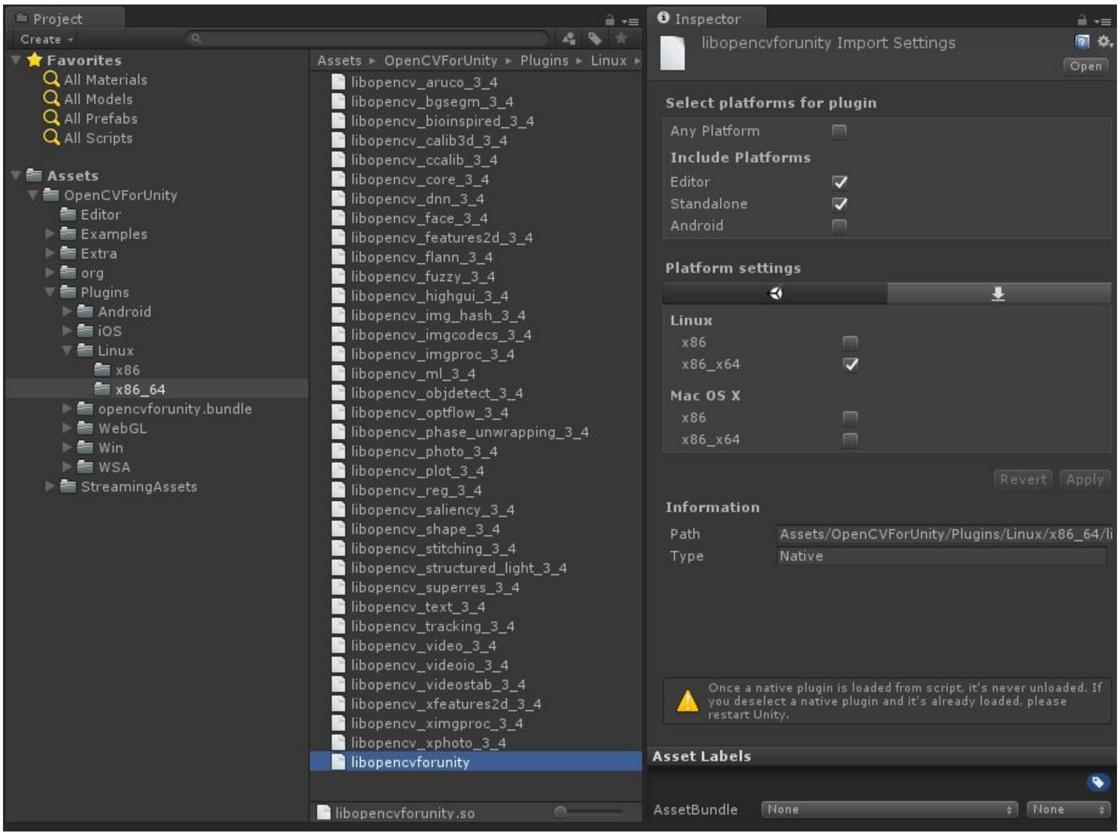
Mac OS X
x86 □
x86_x64 □

Information

Path Assets/OpenCVForUnity/Plugins/Linux/x86/libop
Type Native

Once a native plugin is loaded from script, it's never unloaded. If you deselect a native plugin and it's already loaded, please restart Unity.

- “OpenCVForUnity/Plugins/Linux/x86_64/libopencvforunity.so” – Select platform Editor,Standalone and CPU x86_64 and OS Linux in Inspector.



libopencvforunity Import Settings

Select platforms for plugin

Any Platform □

Include Platforms

Editor ☑

Standalone ☑

Android □

Platform settings

Linux

x86 □

x86_x64 ☑

Mac OS X

x86 □

x86_x64 □

Information

Path Assets/OpenCVForUnity/Plugins/Linux/x86_64/li

Type Native

Once a native plugin is loaded from script, it's never unloaded. If you deselect a native plugin and it's already loaded, please restart Unity.

Asset Labels

AssetBundle None None

- Additional Setting is required to run on the editor. http://forum.unity3d.com/threads/native-plugin-in-editor-steam-specifically.384970/

- If you want to use the OpenCV library you built yourself, you can create the libopencv_*_4_0.so file by following the procedure below.

  1. Build OpenCV4.0.0. (https://github.com/opencv/opencv/tree/59e2ca16d9567dba3bc3ddc318f21dcaae98dc6b) with opencv-contrib(https://github.com/opencv/opencv_contrib/tree/d511587cf0bc782022db215d20d960afb2e9efe2)

Example of Build command

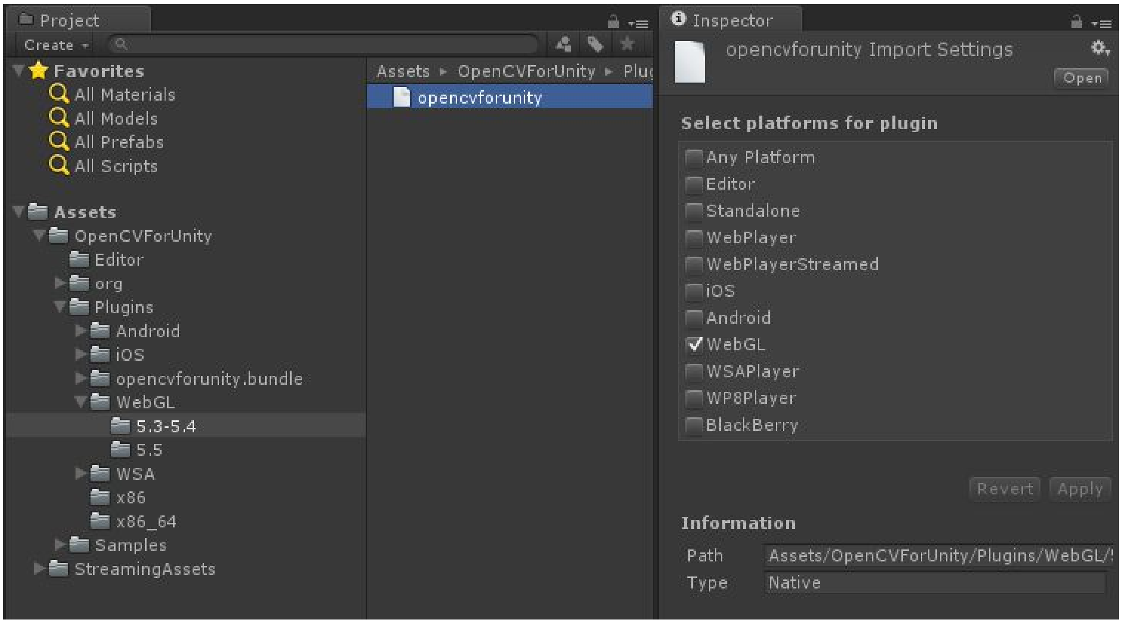
```
#!/bin/sh

sudo apt-get -y install build-essential cmake3 git pkg-config unzip

mkdir opencv
cd opencv
wget
        https://github.com/opencv/opencv/archive/59e2ca16d9567dba3bc3ddc318f21dcaae98dc6b.zip
unzip 59e2ca16d9567dba3bc3ddc318f21dcaae98dc6b.zip
wget
        https://github.com/opencv/opencv_contrib/archive/d511587cf0bc782022db215d20d960afb2e9efe2.zip
```

```
unzip d511587cf0bc782022db215d20d960afb2e9efe2.zip
cd opencv-59e2ca16d9567dba3bc3ddc318f21dcaae98dc6b
mkdir build
cd build
cmake -D CMAKE_BUILD_TYPE=RELEASE -D CMAKE_INSTALL_PREFIX=/usr/local -D
        WITH_TBB=ON -D BUILD_opencv_python2=OFF -D
        BUILD_opencv_python3=OFF -D BUILD_opencv_java=OFF -D WITH_V4L=ON -D
        WITH_OPENCL=OFF -D CV_TRACE=OFF -D
        OPENCV_EXTRA_MODULES_PATH=../../opencv_contrib-d511587cf0bc782022db2
        15d20d960afb2e9efe2/modules -D WITH_FFMPEG=OFF -DENABLE_CXX11=ON
        -D CPU_BASELINE=SSE2 -D BUILD_opencv_gapi=OFF -D
        BUILD_opencv_datasets=OFF -D BUILD_opencv_dnn_objdetect=OFF -D
        BUILD_opencv_dpm=OFF -D BUILD_opencv_hfs=OFF -D
        BUILD_opencv_line_descriptor=OFF -D BUILD_opencv_rgbd=OFF -D
        BUILD_opencv_stereo=OFF -D BUILD_opencv_surface_matching=OFF -D
        BUILD_opencv_xobjdetect=OFF ..
make -j $(nproc)
sudo make install
sudo /bin/bash -c 'echo "/usr/local/lib" > /etc/ld.so.conf.d/opencv.conf'
sudo ldconfig

sudo apt-get install rpl
objdump -p libopencvforunity.so
rpl -R -e .so.4.0 "_4_0.so" libopencvforunity.so
rpl -R -e .so.4.0 "_4_0.so" libopencv*.so.4.0.0
rename "s/".so.4.0.0"/"_4_0.so"/;" libopencv_*.so.4.0.0
```

2. Copy libopencv_*_4_0.so to “/OpenCVForUnity/Plugins/Linux/x86_64” folder.

WebGL Setup Procedure

- "OpenCVForUnity/Plugins/WebGL/unity_version/opencvforunity.bc" – Select platform WebGL in Inspector. By Selecting MenuItem [Tools/OpenCV for Unity/Set Plugin Import Settings], You can easily set up.



opencvforunity Import Settings

Select platforms for plugin

□ Any Platform
□ Editor
□ Standalone
□ WebPlayer
□ WebPlayerStreamed
□ iOS
□ Android
☑ WebGL
□ WSAPlayer
□ WP8Player
□ BlackBerry

Information

Path Assets/OpenCVForUnity/Plugins/WebGL/5

Type Native

- Put the file that you want to use for Utils.getFilePathAsync() in the "Aseets/StreamingAssets/". In Case of WebGL platform, you need to use Utils.getFilePathAsync() instead of Utils.getFilePath(). (haarcascade_frontalface_alt.xml is for OpenCVForUnityExample.scene. Please copy only when necessary.)
- In the WebGL (asm.js) platform, the calculation result of Float type may be significantly different from other platforms. When using the OpenCV's method that use the Mat class (CvType is CV_32F) as an argument, you need to pay attention to the calculation precision.

Q & A

Q1.

Asset package size is large. Is there a way to reduce?

A1.

Please remove plugin folders of non-output target platforms that are included in the package.

Q2.

Support Web platform?

A2.

Since the Unity Web Player does not support the native plugin, “OpenCV for Unity" does not support "WebPlayer Platform”.

A WebGL platform was added as an alternative. (Unity 5.3 or higher).

Q3.

How do learn the details of OpenCV's method and argument?

A3.

Please refer to OpenCV official document (http://docs.opencv.org/4.0.0/index.html) and OpenCV Tutorials (http://docs.opencv.org/4.0.0/d9/df8/tutorial_root.html) for the details of the argument of the method..

Q4.

How can I convert Mat class operators defined in C++?

A4.

Way to translation of Mat class operators defined in C++.

https://enoxsoftware.com/opencvforunity/way-to-translation-of-mat-class-operators-defined-in-cpp/

Q5.

“DllNotFoundException: opencvforunity” is displayed on the console when run the example scene.

A5.

The plugin does not seem to be loaded correctly. Please check the setup procedure.

Q6.

“ArgumentException: The output Mat object has to be of the same size” is displayed on the console when run the example scene.

A6.

After having setup Plugin, Plugin may work well when you reboot Unity.

Q7.

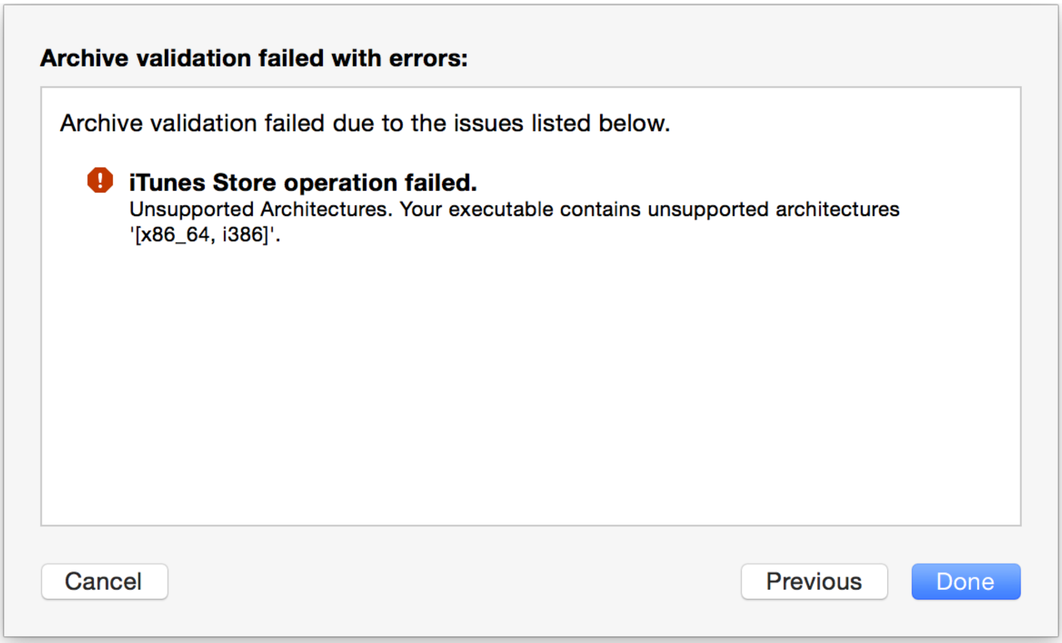
“Level 'Texture2DtoMatExample' (-1) could not be loaded because it has not been added to the build settings.” is displayed on the console when run the example scene.

A7.

Please add all of “***.unity” scenes into the “Assets/OpenCVForUnity/Examples” folder to [Build Settings] – [Scene In Build].

Q8.
In DetectFaceExample or WebCamTextureDetectFaceExample, red rectangle is not displayed around a face.
A8.
You might have failed to read the "haarcascade_frontalface_alt.xml". Please confirm whether there is the "StreamingAssets" folder at the right position.

Q9.
[iOS]Submit to App Store issues: Unsupported Architecture x86, i386"Unsupported Architecture. Your executable contains unsupported architecture '[x86_64, i386]'."



Archive validation failed with errors:

Archive validation failed due to the issues listed below.

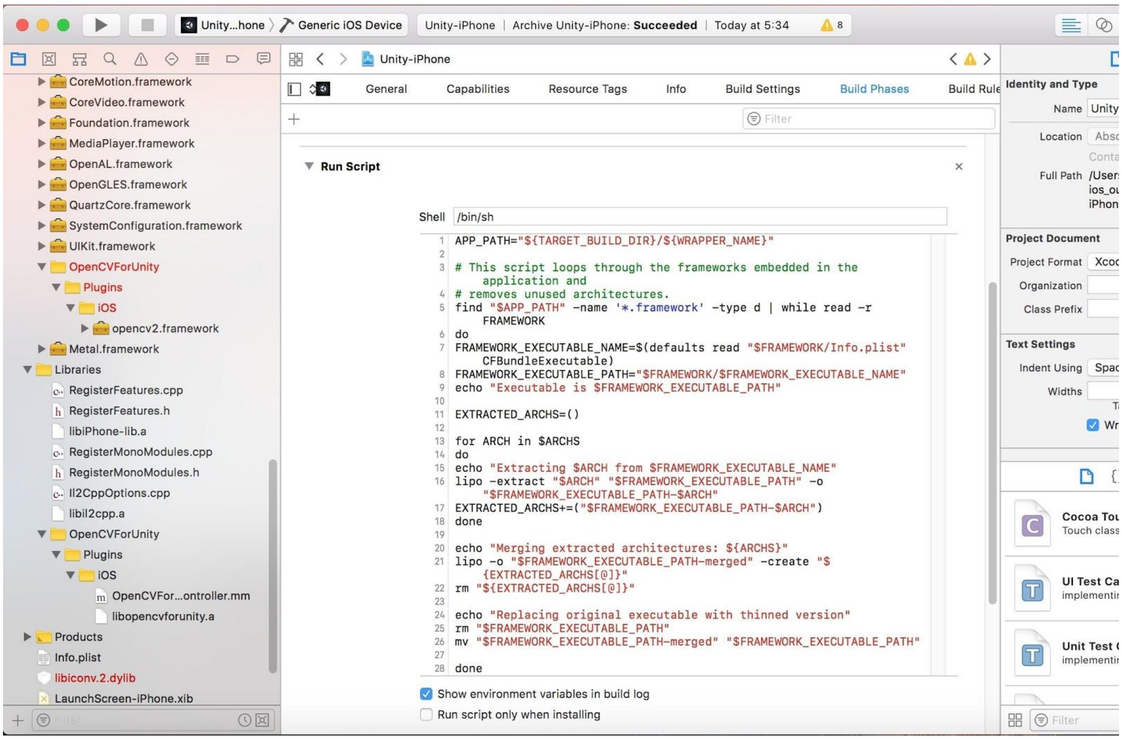
iTunes Store operation failed.
Unsupported Architectures. Your executable contains unsupported architectures '[x86_64, i386]'.

A9.
http://ioscake.com/submit-to-app-store-issues-unsupported-architecture-x86.html
"The problem is that the Buy framework contains a build for both the simulator (x86_64) and the actual devices (ARM).

Of course, you aren't allowed to submit to the App Store a binary for an unsupported architecture, so the solution is to "manually" remove the unneeded architectures from the final binary, before submitting it."

There are **two ways** to solve this error.

1. Please add the script of this page to BuildPhases->RunScript.
   http://ikennd.ac/blog/2015/02/stripping-unwanted-architectures-from-dynamic-libraries-in-xcode/



Run Script

Shell /bin/sh

```
APP_PATH="${TARGET_BUILD_DIR}/${WRAPPER_NAME}"

# This script loops through the frameworks embedded in the application and
# removes unused architectures.
find "$APP_PATH" -name '*.framework' -type d | while read -r FRAMEWORK
do
FRAMEWORK_EXECUTABLE_NAME=$(defaults read "$FRAMEWORK/Info.plist" CFBundleExecutable)
FRAMEWORK_EXECUTABLE_PATH="$FRAMEWORK/$FRAMEWORK_EXECUTABLE_NAME"
echo "Executable is $FRAMEWORK_EXECUTABLE_PATH"

EXTRACTED_ARCHS=()

for ARCH in $ARCHS
do
echo "Extracting $ARCH from $FRAMEWORK_EXECUTABLE_NAME"
lipo -extract "$ARCH" "$FRAMEWORK_EXECUTABLE_PATH" -o "$FRAMEWORK_EXECUTABLE_PATH-$ARCH"
EXTRACTED_ARCHS+=("$FRAMEWORK_EXECUTABLE_PATH-$ARCH")
done

echo "Merging extracted architectures: ${ARCHS}"
lipo -o "$FRAMEWORK_EXECUTABLE_PATH-merged" -create "${EXTRACTED_ARCHS[@]}"
rm "${EXTRACTED_ARCHS[@]}"

echo "Replacing original executable with thinned version"
rm "$FRAMEWORK_EXECUTABLE_PATH"
mv "$FRAMEWORK_EXECUTABLE_PATH-merged" "$FRAMEWORK_EXECUTABLE_PATH"

done
```

☑ Show environment variables in build log

□ Run script only when installing

2. Please execute the following command on terminal.
https://stackoverflow.com/questions/42641806/check-and-remove-unsupported-architecture-x86-64-i386-in-ipa-archive

```
//remove i386 architectures.
lipo -remove i386 opencv2.framework/opencv2 -o opencv2.framework/opencv2

//remove x86_64 architectures.
lipo -remove x86_64 opencv2.framework/opencv2 -o opencv2.framework/opencv2

//check the architectures.
lipo -info opencv2.framework/opencv2
```