



OpenCV for Raspberry Pi

The OpenCV library for Raspberry Pi allows for the use of numerous algorithms of computer vision and image processing in an IEC implementation language.

Product description

The library allows for the use of OpenCV (see <http://opencv.org/>) with an IEC implementation language. Images taken by a camera, such as the RaspiCam or a USB webcam, can be analyzed and further processed on the PLC.

In addition to algorithms for object detection including various filters (for example, Canny, Gauss) and functions for camera calibration, the library contains functions for reading and saving images and other media files.

Scope

The library contains only functions and structures of the C API from OpenCV in Version 2.4.9. Altogether there are about 480 functions from OpenCV that can be used.

More information

Installing the CODESYS package

Install the package "OpenCV_for_Raspberry_Pi.package" from the CODESYS Package Manager.

Installing OpenCV on Raspberry Pi

In order to use the library on the Raspberry Pi, OpenCV must already be installed on the Raspberry Pi. The specific version can be installed using the following command:

```
sudo apt-get install libopencv-dev=2.4.9.1+dfsg-1+deb8u1.
```

Setting up the temporary file system

For temporary buffering of images, a temporary file system is required in the /tmp folder.

Commands for setting up the temporary file system:

```
sudo -s
```

Add the following lines in the file /etc/fstab (if not already available):

```
tmp          /tmp          tmpfs        defaults    0          0
```

Restart the system:

```
reboot
```

Installing the OpenCV component for the runtime system

Then the OpenCV component for the runtime system has to be installed.

The Debian package "codesys_raspi_opencv_V3.5.11.0.deb" is located in the installation directory. CODESYS can be used in order to copy the file (Device => Files) to the root directory of the Raspberry Pi.

Then execute the following commands on the Raspberry Pi:

```
sudo -s
```

```
cd /var/opt/codesys
```

```
dpkg -i codesys_raspi_opencv_V3.5.11.0.deb
```

```
exit
```

Now the functions of OpenCV can be used in CODESYS via the library "CmpOpenCV". The description of the individual functions is located in the OpenCV documentation (see <http://docs.opencv.org/2.4.9/>).

Sample project

The package includes the sample project "CameraStreamOpenCVExample.project" which demonstrates how to use a camera with a simple linear (Sobel) filter. In addition, the example demonstrates how to display an image

in the web visualization.

Note: The image is displayed in the web visualization only. The image is not displayed in the integrated visualization.

Features

- Some OpenCV structures have the extension “_CDSType” in the OpenCV CODESYS library. This is used for reducing name conflicts between structures and their initialization functions, which are differentiated in the C-API only by uppercase/lowercase.

For example: *cvScalar* becomes *cvScalar_CDSType*

- Some OpenCV functions expect the value of an enum as the argument. As these are not available in the library, the corresponding numeric value has to be specified instead.

For example: *cvCvtColor (img, destination, CV_RGB2GRAY)* becomes *cvCvtColor(img, destination, 7)*

The values of the enums are described in the online help of OpenCV or in the header files.

General information

Manufacturer:

3S-Smart Software Solutions GmbH
 Memminger Strasse 151
 87439 Kempten
 Germany

Support:

<https://support.codesys.com>

Item:

OpenCV for Raspberry Pi

Item number:

000088

Sales:

CODESYS Store

<https://store.codesys.com>

Included in delivery:

CODESYS package with the following components:

- Runtime system extension (Debian package)
- Library CmpOpenCV
- Sample project

System requirements and restrictions

Programming System	CODESYS Development System V3.5.11.0 or higher
Runtime System	CODESYS Control for Raspberry Pi V3.5.11.0 or higher
Supported Platforms/ Devices	CODESYS Control for Raspberry Pi
Additional Requirements	OpenCV 2.4.9.1
Restrictions	The library contains only functions and structures of the C API from OpenCV in Version 2.4.9.
Licensing	-
Required Accessories	-

Note: Not all CODESYS features are available in all territories. For more information on geographic restrictions, please contact sales@codesys.com.

Note: Technical specifications are subject to change. Errors and omissions excepted. The content of the current online version of this document applies.