OpenCV

API Document

Version 1.1

e-con Systems

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Your Product Development Partner

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Introduction to OpenCV

OpenCV (Open Source Computer Vision Library) is an open source computer vision and machine learning software library. OpenCV libraries are used to communicate with cameras. APIs introduced in the OpenCV can be supported with all e-con Systems cameras.

This document provides the details about the APIs introduced in the OpenCV Video Capture class.

Description

The APIs introduced in the OpenCV can be used to communicate with the cameras. Human Interface Device(HID) related APIs were implemented in the OpenCV, which will be useful to access HID device information of the camera. The APIs introduced were solely related to communicate with camera properties and HID settings of the camera.

Introduced APIs

The details regarding the APIs introduced in OpenCV are covered in this section.

BOOL getDevices(int &devices)

This function retrieves the number of camera devices connected to the PC.

Parameters	Description	Return Values
`int &devices`	Number of camera devices connected to the port is retrieved.	TRUE on Success FALSE on Failure Number of Devices Connected

Sample Code

```
VideoCapture cap;
if(cap.getDevices(devices))
{
      cout << "The number of camera devices connected to the port is " << devices << '\n';
}
```

BOOL getDeviceInfo(int index, String &deviceName, String &vid, String &pid, String &devicePath)

This function will retrieve the Name, Vendor ID, Product ID and Path of the camera device connected to the port. Before calling this API, you must know the index of the camera device connected to the port.

Parameters	Description	Return Values
`int index`	You must input the camera device index.	TRUE on Success FALSE on Failure
`String &deviceName`	Retrieves the Name of the camera device.	
`String &vid`	Retrieves the Vendor ID of the camera device.	
`String &pid`	Retrieves the Product ID of the camera device.	
`String &devicePath`	Retrieves the Path of the camera device.	

Sample Code

```
VideoCapture cap;
if(cap.getDevices(devices))
{
      for(int i = 0; i < devices; i++)
      {
            if(cap.getDeviceInfo(i, deviceName, vid, pid,
devicePath))
            {
                  cout << "Camera Device Name = " <<
deviceName << endl;
                  cout << "Vendor ID = " << vid << endl;
                  cout << "Product ID = " << pid << endl;
                  cout << "Camera Device Path = " <<
devicePath << endl;
            }
      }
}
```

BOOL getFormats(int &formats)

This function is used to get the total number of Video formats supported by the camera with respect to frames per second (fps). Before calling this API, the camera must be opened.

Parameters	Description	Return Values
`int &formats`	Retrieves the number of formats supported by the camera with respect to fps.	TRUE on Success FALSE on Failure Number of Video formats supported.

Sample Code

```
VideoCapture cap;
cap.open(0);
if(cap.getFormats(formats))
{
      cout << "The total number of formats supported by
the Camera = " << formats << endl;
}
```

BOOL getFormatType(int formats, String &formatType, int &width, int &height, int &fps)

This function is used to get the Format type, width, height and fps of the camera device connected with respect to the index passed. Before calling this API, you must open the camera and pass the input parameter index to this API.

Parameters	Description	Return Values
`int formats`	Integer value to be passed as index to the API.	TRUE on Success FALSE on Failure
`String &formatType`	Retrieves the Format type of the camera with respect to the index passed.	
`int &width`	Retrieves the width of the resolution with respect to the index passed.	
`int &height`	Retrieves the height of the resolution with respect to the index passed.	
`int &fps`	Retrieves the fps with respect to the index passed.	

Sample Code

```
VideoCapture cap;
cap.open(0);
if(cap.getFormats(&formats))
{
      for (int i = 0; i < formats; i++)
      {
            if(cap.getFormatType(i, formatType, width,
height, fps))
            {
                  cout << "Video Format = " << formatType
<< endl;
                  cout << "Width = " << vid << endl;
                  cout << "Height = " << pid << endl;
                  cout << "FPS(Frames per Second = " << fps
<< endl;

            }
      }
}
```

BOOL setFormatType(int index)

This function is used to set the Format type, width, height and fps to the camera. Before calling this API, the camera must be open.

Parameters	Description	Return Values
`int index`	Index to be passed as the input to set the Video Format.	TRUE on Success FALSE on Failure

Sample Code

```
VideoCapture cap;
cap.open(0);
if(cap.getFormats(&formats))
{
      for (int i = 0; i < formats; i++)
      {
            if(cap.getFormatType(i, formatType, width,
height, fps))
            {
                  cout << "Video Format = "<< formatType <<
endl;
                  cout << "Width = " << width << endl;
                  cout << "Height = "<< height << endl;
                  cout << "FPS = " << fps;
            }
      }
}
cin >> index;
if(cap.setFormatType(index))
{
      cout << "Video Format Type is set" <<  endl;
}
```

BOOL get(int propId, long &min, long &max, long &steppingDelta, long &supportedMode, long &currentValue, long &currentMode, long &defaultValue)

This function is used to retrieve the Minimum, Maximum, Stepping Delta, Supported Mode, Current Value, Current Mode and Default Value of the Camera Video Properties. Before calling this API, the camera must be opened and you must know the property ID of the OpenCV Camera Properties (For example,

CV_CAP_PROP_BRIGHTNESS for brightness, CV_CAP_PROP_CONTRAST for contrast and so on).

Parameters	Description	Return Values
`int propId`	Input the property ID of the camera properties to the API.	TRUE on Success FALSE on Failure
`long &min`	Retrieves the Minimum value of the camera property supported.	
`long &max`	Retrieves the Maximum value of the camera property supported.	
`long &steppingDelta`	Retrieves the Stepping Delta of the camera property supported.	
`long &supportedMode`	Retrieves the supported Mode of the camera property (1-Auto, 2-Manual, 3-Auto and Manual).	
`long &currentValue`	Retrieves the current value set in the camera property.	
`long &currentMode`	Retrieves the current Mode set in the Camera.	
`Long &defaultValue`	Default value of the camera is retrieved for the camera property.	

Sample Code

```
VideoCapture cap;
cap.open(0);
if(get(CV_CAP_PROP_BRIGHTNESS, min, max, steppingDelta,
supportedMode, currentValue, currentMode, defaultValue))
{
      cout << "Brightness Values: " << endl;
      cout << " Minimum Value = " << min << endl;
      cout << " Maximum Value = " << max << endl;
      cout << "Stepping Delta = " << steppingDelta <<
endl;
      cout << "Supported Mode = "<< supportedMode << endl;
      cout << "Current Value = " << currentValue << endl;
      cout << "Current Mode = " << currentMode << endl;
      cout << "Default Value = " << defaultValue << endl;

}
```

BOOL set(int propId, long value, long mode)

This function is used to set the value and mode to the camera property which is passed as input parameter to the API. Before calling this function, the camera must be opened and you must know to which property the value is passed.

1 - Auto mode.

2 - Manual mode.

3 - Auto and Manual mode.

Parameters	Description	Return Values
`int propId`	You must input the property ID of the camera properties to the API.	
`long value`	The value to be set in the camera property is passed in this parameter.	
`long mode`	This parameter is used to change the mode of the camera property. (If the camera supports only auto mode, you cannot set the different value or mode and if the camera supports only manual mode, you cannot set the auto mode).	TRUE on Success FALSE on Failure

Sample Code

```
VideoCapture cap;
cap.open(0);
if(cap.set(CV_CAP_PROP_BRIGHTNESS, 12, 2))
{
      cout << "Camera Brightness value is set" << endl;
}
```

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Revision History

Rev	Date	Description	Author
1.0	10-Apr-18	Initial Draft	Chandra Sekar V
1.1	27-Jul-18	getFormatType API sample code has been modified	Chandra Sekar V