Point Cloud Viewer (PCV) for Simulink®

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1. Introduction

　PCV for Simulink is a Simulink block which wraps OpenCV to display point cloud with faster performance.

2. Disclaimer

　The author of *PCV for Simulink* and the organization which the author belongs to, do NOT take any responsibility for any loss or damage of any kind incurred as a result of use or download of *PCV for Simulink* and related 3rd party software.

Note that the Point Cloud Viewer rendering methods using OpenCV is copied from OpenCV.jp sample written by Professor Norishige Fukushima.

http://opencv.jp/opencv2-x-samples/point-cloud-rendering

3. Required software

3-1. MATLAB® products

-    MATLAB R2011b 32bit/64bit or later

-    Simulink

Furthermore, these products are optional.

-    Computer Vision System Toolbox (highly recommended)

3-2. Operating System

Microsoft Windows7 32bit/64bit

3-3. C MEX Compiler

Install Microsoft Visual Studio 2010 Express Edition (VC++) and Microsoft Windows SDK 7.1 and set as C MEX Compiler.

3-3.Simulink for NID

http://www.mathworks.com/matlabcentral/fileexchange/32318-simulink-for-natural-interaction-device-nid

3-4 OpenCV

OpenCV 2.3.1 for Windows 32bit/64bit

http://sourceforge.net/projects/opencvlibrary/files/opencv-win/2.3.1/OpenCV-2.3.1-win-superpack.exe/download

Note that other versions of OpenCV do not work with PCV for Simulink.

4. Installations

Step1: Make sure that MATLAB R2011b 32bit/64bit or later is installed in Windows 32bit/64bit.

Step2: Make sure that VS2010 (VC++) is installed and setup as the MATLAB C MEX compiler.

Step3: Make sure that Simulink for NID is installed. Both of Kinect SDK and OpenNI can be used with PCV for Simulink.

Step4: Install OpenCV 2.3.1 and manually, add Windows environment path to the folder which OpenCV dll are stored.

In case of 32bit version of MATLAB R2011b or later,

set path to e.g. C:¥opencv¥build¥x86¥vc10¥bin

In case of 64bit version of MATLAB R2011b or later,

set path to e.g. C:¥opencv¥build¥x64¥vc10¥bin

Step5: Run slpcv¥setup_opencv.m. If everything is installed properly, C MEX file (sfun_pcv.mexw32) and simulinkfornidopencvinfo.m should be generated in slpcv¥Lib directory.

Note that detailed description about Point Cloud Viewer block is linked here:

Lib/doc_en/slpcv.html

5. Remarks

- PCV for Simulink does not support code generation by Simulink Coder.
  (Only Simulink Accelerator is supported).
- How to take point cloud panorama view:
  1. Run nid_cvst_ocv_panorama_qvga.mdl or nid_cvst_ocv_panorama_vga.mdl in Samples
  2. Slowly Turn NID in horizontal direction until xShift reaches 640 (in Display block)

Note that FOV of NID is 58 degree and it refers to 320 pixels in X. Therefore, total field of view in the panorama is 58 * (320 + 640)/320 = 174 degree.

7. Revisions

Version 0.2.0 (October 22, 2012)

- Changed supported version of MATLAB to R2011b or later (it used to be R2010b) to support both of 32bit and 64bit version of MATLAB
- Changed supported version of OpenCV to 2.3.1 (it used to be 2.2)

Note that Simulink for PCV 0.2.0 does not work in MATLAB R2010b anymore.

Version 0.1.0 (June 5, 2012)

- Initial public release