DUO SDK

Overview

The DUO SDK provides APIs, examples and tooling for working with multi-view vision systems. Built on modern image processing techniques which leverage the latest technologies from Intel/AMD (SSE, AVX) and parallel computing methods. This is a highly optimized architecture for image acquisition/processing. Developers can leverage this framework to build and deploy their own applications.

Features

- Device API
- Middleware APIs
    - Dense3D API
- Samples
    - C++ Samples
    - C# Samples (.NET)
    - Dense3D Samples
    - OpenCV Samples
    - Qt5 Samples
- ARM/Tegra Platforms
- Linux/Mac/Windows Platforms
- Roll your own algorithms
- Robust & stable processing
- Optimized imaging pipeline

Libraries Summary

Here are the key libraries you will interact when working with the SDK:

- **DUOLib** - The DUO Device API provides low level access to the device allowing for control, configuration and device information.
- **DUODense3DLib** - The DUO Dense3D API provides high level processor for generation of a depth map from the image frames.

Compilation

We use the cross platform CMake tool to generate IDE/compiler specific projects. To compile the samples you will need to install the latest CMake and use either the command line or GUI to configure and generate the projects. We also provide examples that use OpenCV which you can download from their website. If you wish to bypass the OpenCV install simply remove Sample-06 from the CMakeLists.txt before generating your build files.

Build Environment

Windows

1) Visual Studio 2012+ Recommenced
2) Download and install CMake installer (Select the "Add to the PATH" option)
3) Download and extract OpenCV 2.4.7.2 into C:\OpenCV\2.4.7.2
4) Add `C:\OpenCV\2.4.7.2` to the system PATH variable

Mac OS X

1) Install XCode and make sure developer mode is enabled
2) Download and install CMake
4) Download and build/install OpenCV 2.4.7 from source

- Extract the zip and open a new terminal
- In the terminal and navigate to the OpenCV folder
- Use Cmake command line or GUI to generate UNIX Makefiles (should generate a build folder)
- Type 'cd build' and then `sudo make install` commands to install OpenCV

Linux OS

1) Install build-essential
2) Download and install CMake
3) Install `libgtk2.0-dev`
4) Download and build OpenCV 2.4.7 from source (similar to OSX)
5) Install OpenCV to `/usr/local`

Building the Samples

We provide a build script in the samples directory which you can run to quickly generate the sample binaries. The executable files will be generated in the bin folder. You can also use Cmake to generate for specific IDE/compiler such as Visual Studio/XCode/etc.

Windows:

Double-click or run `BuildAll-x86/x64.cmd` from command prompt

Linux/OSX:

In terminal type: `sh ./BuildAll.sh`

Samples

Included with the SDK are several examples to help developers get started. We will also publish more to the github project as we release updates.

duo3d/
samples

4
1

Samples for use with DUO devices. Learn more at: — Read More
http://duo3d.com/docs

Latest commit to the **master** branch on 10-29-2014

Download Archive

Capturing Motion Data

Sample 01 - Shows how to capture and debut the DUO minilx motion data.

Capturing Image Data

Sample 02 - Shows how to capture the DUO image frame data from CMOS sensors.

Configuring Parameters

Sample 03 - Shows how to configure the programmable LED Array.

Configuring LED Sequences

Sample 04 - Shows how to pass sequences the programmable LED Array.

Capture frames using polling mechanism

Sample 05 - Demonstrates polling mechanism for capturing frames.

Capture frames using polling mechanism (OpenCV)

OpenCV Sample - Demonstrates polling mechanism and displays captured frames using OpenCV.

Integration

DUO works well with common vision related frameworks such as the Robot Operating System (ROS), OpenCV, MRPT and more. Get started by reviewing our integration articles

Structure

Here is a quick overview of the structure of our SDK and samples:

```
+---Docs
+---Samples
|   +---bin (Output)
|   +---C#
|   |   +---DUODeviceLib
|   |   +---Sample-01-Console
|   |   +---Sample-02-DeviceConsole
|   |   \---Sample-03-WPF
|   +---C++
|   |   |   README.txt
|   |   |   CMakeLists.txt
|   |   +---Sample-01-Motion
|   |   +---Sample-02-Images
|   |   +---Sample-03-Parameters
|   |   +---Sample-04-Sequences
|   |   \---Sample-05-Polling
|   +---Dense3D
|   |   \---Sample-01-Dense3D
|   +---OpenCV
|   |   \---Sample-10-cvShowImage
|   \---Qt
|       \---Sample-01-Display
\---SDK
    +---include
    |       Dense3D.h
    |       DUOLib.h
    +---windows
    |   +---x64
    |   |      Dense3D.dll
    |   |      Dense3D.lib
    |   |      DUOLib.dll
    |   |      DUOLib.lib
    |   \---x86
    |           Dense3D.dll
    |           Dense3D.lib
    |           DUOLib.dll
    |           DUOLib.lib
    +---linux
    |   +---x64
    |           libduo.so
    |           libdense3d.so
    \---osx
        \---x64
                libduo.dylib
                libdense3d.dylib
```

Resources

Related

- DUO API
- DUO Developers
- DUO Devices
- DUO Downloads