# **CVI620/DPS920- Lab 1**

# **Introduction to OpenCV**

| Total Mark: | 10 marks (2.5% of the total course grade)   * 7 out of 10: Blackboard submission (Due: End of week 1) * 3 out of 10: Lab demo (Due: During lab of week 2) |
| --- | --- |
| Submission file(s): | * Team\_Contract.docx * PropertySheet\_debug.props |

Please work in **groups** to complete this lab. This lab is worth 2.5% of the total course grade and will be evaluated through your written submission, as well as the lab demo. During the lab demo, group members are *randomly* selected to explain the submitted solution. Group members not present during the lab demo will lose the demo mark.

Please submit the submission file(s) through Blackboard. Only one person must submit for the group.

## **Part I: The Team Contract**

Make groups of three to work on the assignments for this course. Ideally, you will stick together for the rest of the term ☺. Prepare and agree on a team contract to minimize future disagreements. This contract must contain “Team Procedures”, “Team Expectations” and “Consequences”. Note that the course instructor can void this contract. See the following links for samples:

* Guidelines for writing team contracts- University of Arizona: <http://math.arizona.edu/~kerimar/Team%20Contract.doc>
* Team Contract- Georgia Tech: <http://www.cc.gatech.edu/~simpkins/teaching/gatech/cs4911/project/team-contract.pdf>

Submit a signed copy of the contract as Team\_Contract.docx. (Adding your names at the end of the digital document is sufficient.)

## **Part II: Property sheet for OpenCV projects**

1. Follow the instructions in wk01\_software\_installation.txt for software installation.
2. Create a New Project in VS, choose Console Application (C++) and name it Lab01.
3. In this step, we will build the 'Debug' Property Sheet for OpenCV projects. We will be able to re-use this in our future projects. More information and pictures are available here:

<https://docs.opencv.org/3.4.9/dd/d6e/tutorial_windows_visual_studio_opencv.html>

* + 1. Go to View > Other Windows > Property Manager
    2. Expand Lab01 and right click on 'Debug | x64' and select 'Add New Project Property Sheet' and name it ‘PropertySheet\_debug.props’
    3. Expand 'Debug | x64' and right click the new property sheet created and select Properties
    4. Go to C/C++ > General > Additional include directories and set to:

$(OPENCV\_DIR)/../../include/

* + 1. Go to Linker > General > Additional library directories and set to

$(OPENCV\_DIR)\lib

* + 1. Go to Linker > input > Additional dependencies and click on Edit. Add the following:

opencv\_world349d.lib

(The letter d in file name is for debug.)

1. Close the property pages. Then right click on PropertySheet\_debug, and select 'Save PropertySheet\_debug'
2. Submit this file.

Similarly, you could create a property sheet for release builds, if needed.

## **Part III: A simple OpenCV project**

1. In VS, make sure ‘Debug’ and ‘x64’ are selected.
2. Copy and paste the following code in Lab01.cpp.

/\* Source: <https://docs.opencv.org/3.4.9/dd/d6e/tutorial_windows_visual_studio_opencv.html> \*/

#include <opencv2/core.hpp>

#include <opencv2/imgcodecs.hpp>

#include <opencv2/highgui.hpp>

#include <iostream>

using namespace cv;

using namespace std;

int main(int argc, char\*\* argv)

{

if (argc != 2)

{

cout << " Usage: " << argv[0] << " ImageToLoadAndDisplay" << endl;

return -1;

}

Mat image;

image = imread(argv[1], IMREAD\_COLOR); // Read the file

if (image.empty()) // Check for invalid input

{

cout << "Could not open or find the image" << std::endl;

return -1;

}

namedWindow("Display window", WINDOW\_AUTOSIZE); // Create a window for display.

imshow("Display window", image); // Show our image inside it.

waitKey(0); // Wait for a keystroke in the window

return 0;

}

1. Go to Build > Build solution.
2. Copy a jpg file (e.g. sample.jpg) to the output folder (Debug or Release) and run with the jpg file name as an argument in Command Prompt. For example:

> Lab01.exe sample.jpg

You should see the jpg in a window. Press any key to exit.

(Or add the jpg file to Project properties> Debugging > Command Arguments and run in VS)