

### Final Project

As part of your final project, you will build a C application leveraging one or more open-source libraries. In addition to producing your own code, a critical skill of software development is the ability to utilize existing code. This involves reading documentation, compiling and linking library code with your own.

You are free to utilize any open-source library for your project. However, we recommend some libraries for which you may expect some level technical support from us.

#### **OpenCV**

OpenCV is a open-source computer vision library, originally developed by Intel and now widely developed by a large community of contributors. The library consists of routines for acquiring images from webcams, image processing operations, image analysis routines and pattern classifiers. Example applications that can be developed using OpenCV library include face-detection and recognition, object Identification etc. You can find more details at <http://sourceforge.net/projects/opencvlibrary/>

#### **ImageMagick**

ImageMagick is a software suite and also a library that allows you to to create, edit, and compose images. It can read, convert and write images in over 100 fromats that includes PNG, PDF, BMP, JPG etc. You can use imagemagick library to embedd text in images, do common operations such as enhancing color, scaling images etc. You can find more details about the library at <http://sourceforge.net/projects/opencvlibrary/>

#### **CUDA**

CUDA (C unified device architecture) is a library developed by NVIDIA to leverage the general purpose processing power of GPUs. CUDA allows you to use C-language to develop compute-intensive applications on the GPU. **Note:** While you can develop and debug code in emulation mode on any computer, you have to have a CUDA enabled NVIDIA graphics in order to leverage the processing power offered by these devices. You can find more details at [http://www.nvidia.com/object/cuda\\_home.html](http://www.nvidia.com/object/cuda_home.html)

#### **FFTW**

FFTW stands for fastest Fourier transform in the west! True to its name, FFTW is one of the fastest publicly available libraries for perform discrete Fourier transform in multiple dimensions. If you would like to build applications for signal processing, image processing, radar processing then you will find this library very valuable.

## SQLite

SQLite is a library that implements a SQL database engine. It makes working with databases as easy as reading and writing files. It implements a large section of the SQL specification. You can embed it in your applications without any configuration. You can find more details at <http://sqlite.org>

## libCURL

libCURL is a client side URL transfer library that supports over a dozen transfer protocols such as http, ftp, ftps, scp etc. Using this library you can build applications that uploads and downloads content over a network. libcurl is free, thread-safe, IPv6 compatible and fast. You can get more details about libCURL at <http://curl.haxx.se/>

## Deliverables

As part of the project submission you are required to submit a one-page proposal. Due to limited time frame, plan your project carefully. The proposal a week before the project is designed to force you to consider the scope and design of the project carefully. At the end of the project, you are required to submit a more substantial write up describing the nature of your project, your design choices, documentation to download and run your code. Also make sure you attribute any publicly available code that you used to its proper sources. Finally, you are also required to submit code as part of your submission. Code that cannot be run by the lab-assistants based on the provided documentation will not be evaluated.

## Important Dates

Project proposal	1/22
Project Report	1/29
Code	1/29

## Evaluation

In addition to writing code, documentation is critical if the code is intended for use by others than its authors. The projects will be evaluated on the correctness of code, ingenuity. It will also be evaluated on the extent of its documentation. Due to limited time, project material submitted after the deadlines will not be evaluated.

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6.087 Practical Programming in C  
January (IAP) 2010

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