How to build Gem in Microsoft Windows

Preambule

As I'm French, I have a French version of Visual C++ 2010 Express. I translated menu titles here myself and the translation may differ from the official one. I apologized for that.

Requirement

Visual C++

You need a Visual C++ environment to build Gem. You can download and install Visual C++ 2010 Express. A serial number is needed but you can get one for free from Microsoft.

> NOTE : In Visual C++ you will find the *Properties manager* (*Gestionnaire de propriétés*) under the View (Affichage) menu. If you have the Express edition, it is hidden... Click on *Tools* > *Parameters* > *Advanced parameters* (*Outils* > *Paramètres* > *Paramètres avancés*) to see it.

Puredata

You need the puredata sources to build Gem, the Vanilla or Extended version. The easiest way is to download a zip for Windows from http://puredata.info/downloads. Then unpack it.

Pthread

Download the latest release from here : http://sourceforge.net/projects/pthreads4w/ and unpack it.

FTGL and Freetype

You also need FTGL and Freetype libraries. There are binaries for Freetype on the web but I can't find any for FTGL.

1. Freetype
   a) Unfortunately, Freetype 2.3.5 has some linking issues. So I used the latest version available 2.5.0, but there are no binary. Here is how to build it yourself.
   b) Download freetype-2.5.0.tar.gz or somethingn like that from http://www.freetype.org/download.html.
   c) Extract the zip file in a place you know and you may remember easily (e.g. I put it in : `C:\Users\win7\Bibliothèques\freetype-2.5.0\`
   d) Open the solution which fits best your environment (for me and Visual C++ 2010 Express it's `builds\win32\vc2010\freetype.sln`)
   e) Select the `Release Multithreaded` and `Win32` configurations then hit `F7` to generate the solution.
   f) You should have a `freetype250MT.lib` under `objs\win32\vc2010` (or something else somewhere under the `objs` folder depending on your configuration).

g) For the next steps, it is useful to setup a global environment variable called `FREETYPE` and pointing to the root of the freetype directory (where `objs` and `include` folders are).

2. FTGL
   a) Download FTGL from http://sourceforge.net/projects/ftgl/
   b) Extract the tar.gz file (you may need a good archive extractor to do that, 7zip is a good candidate http://www.7-zip.org/) (again in a place you know and you may remember easily)
   c) Then open the `ftgl-2.1.3~rc5\msvc\vc8\ftgl.sln` file in Visual C++. If you are not using VC8 the project should be converted automatically and please follow the wizard.
   d) Then open the ftgl_dll property sheet and go to “Commun properies > Link editor > entry” (Propriétés communes > Editeur de liens > entrée) and change the `freetype250MT.lib` to the one you have generated on step 1.f.
   e) Now you can build the solution by pressing “F7”

Getting GEM sources

If you just want to build the last version of Gem but you do not planned to make modifications in the code, let's get a tarball from sourceforge or github of a fresh snapshot.

“Download a zip” here : https://github.com/umlaeute/Gem
or “Download snapshot” here : http://sourceforge.net/p/pd-gem/gem/ci/master/tree/

If you planned to make some improvement on Gem (and I encourage you to do that) then it's better to clone the Git repository. Here I quote Iohaness[1] who explains his preferred way to contribute (and this is not Windows specific) :

> - - go to http://github.com/ and get yourself an account (e.g. "rybn"),
> then log in.
> - - go to http://github.com/umlaeute/Gem, and click on the "Fork" button
> in the upper-right corner.
> - - this will fork the repository into http://github.com/rybn/Gem, go
> there and follow the instructions to clone the repository to your
> local machine.
> - - do work (add new abstractions/,...) and commit them to your local copy
> - - push them to github
> - - go back to http://github.com/rybn/Gem and click on "Pull Request"
> and follow the instructions there.
> - - i will get a notification that i should merge in your changes and
> can do so (after reviewing them)

Then you have a folder containing all the sources files, I will call it “Gem_root” in the next.

Configuring Gem solution in Visual C++

In the `Gem\build\win-vc2010e` folder, you will find a `Gem.sln` file. Some conversion may be needed if you are using another version of Visual C++.

1 The original message is here : http://lists.puredata.info/pipermail/gem-dev/2013-09/006564.html

Once the project imported, open the *Properties manager*[2] window and find the Puredata configuration. Open it and adjust the PD_DIR macro under the *User macro* page to point to your Pd folder.

In the `pthread` properties sheet change the `PTHREAD_DIR` and the PD_DIR macro to point to the `pthread` directory (for me it's `C:\Users\win7\Bibliothèques\pthreads-w32-2-9-1-release\Pre-built.2`) and to the `pd` directory.

In the `FTGL` properties sheet, under the `FTGL Release` or the `FTGL Debug` configuration, adjust the `FREETYPE` and the `FTGL` paths (e.g. `C:\Users\win7\Bibliothèques\freetype-2.3.5-1-lib` and `C:\Users\win7\Bibliothèques\ftgl-2.1.3~rc5`).

Now you will be able to generate at least the Gem project.

Building plugins and addons

To build plug-ins, you will need several additional libraries.

filmAVI – play films with Video for Windows

This plug-in should build without any additional library.

filmDS – play films with Direct Show

You need the Microsoft Windows SDK : http://msdn.microsoft.com/en-US/windows/desktop/bb980924. Some files lack in the one that comes with Visual C++ 2010 Express.

You need the Windows Driver Kit for ATL support : http://msdn.microsoft.com/en-us/windows/hardware/hh852365. Get the one compatible with your IDE (7.1,0 for me)

Update the macros in the DirectShow properties sheet.

filmQT – play films with QuickTime

You need the QuickTime SDK for Windows : https://developer.apple.com/quicktime/ (you need an Apple Developper account to download it...).

If you install it in the default location ("`C:\Program Files`") you don't need to adjust any path.

imageJPEG – load still image with libjpeg

You need libjpeg : http://gnuwin32.sourceforge.net/packages/jpeg.htm

Download the *Developer files* and extract it. Adjust the `LIBJPEG_DIR` macro in the `JPEG` properties sheet to point where you extracted the files (e.g. `C:\Users\win7\Bibliothèques\jpeg-6b-4-lib`).

2 See FTGL and Freetype Erreur : source de la référence non trouvée on page Erreur : source de la référence non trouvée if you can't find it.

imageTIFF – load still image with libtiff

You need the libtiff for Windows. Choose the *Developer files* here :http://gnuwin32.sourceforge.net/packages/tiff.htm. Then adjust the `LIBTIFF_DIR` macro in the `TIFF` properties sheet.

pix_artoolkit – detect ARToolkit tag with Gem

You need the ARToolkit library for Windows : http://sourceforge.net/projects/artoolkit/files/artoolkit/. The Windows binary release contains all what you need. Adjust the ARTOOLKIT_DIR variable in `pix_artoolkit` properties sheet.