

How to build Gem in Microsoft Windows

Preamble

As I'm French, I have a French version of Visual C++ 2008 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.

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`¹ or something 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 Windows XP 32bit 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).

¹ <http://download.savannah.gnu.org/releases/freetype/freetype-2.5.0.tar.gz>

- 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). This is under the advanced system properties of Windows, its location depends on the Windows version.

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_static.vcproj` file in Visual C++. If you are not using VC8 the project should be converted automatically and please follow the wizard. You could also choose some project under other folder depending on your version.
- d) Then generate the solution (you may need to save the solution first). And you will get a `ftgl_static.lib` file under the `msvc/build` folder.

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. But you need git for windows² to do that. Here I quote Iohaness³ 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. Please read also `doc/CodingStyle.txt` before making changes.

² <http://msysgit.github.io/>

³ The original message is here : <http://lists.puredata.info/pipermail/gem-dev/2013-09/006564.html>

Configuring Gem solution in Visual C++

In the `Gem\build\win-vce20104` folder, you will find a `Gem.sln` file. Some conversion may be needed if you are using another version of Visual C++.

Once the project imported, open the *Properties manager*⁵ 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 Developer 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`).

⁴ The « e » is for Express, not for Embedded.

⁵ See FTGL and Freetype on page 1 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

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 `ARToolkit` properties sheet.