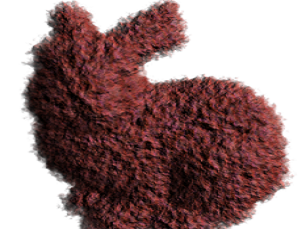
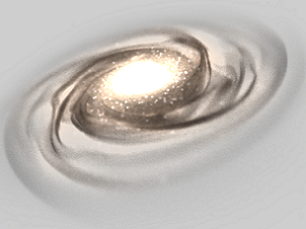
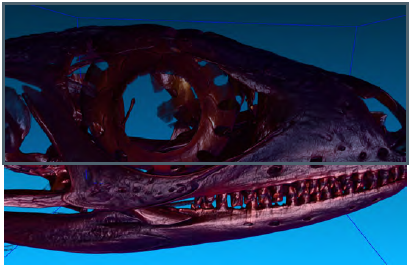


ISSN 0249-6399



**GigaSpace, getting started guide for Microsoft Windows**

Pascal Guehl , Fabrice Neyret

**N° 9999**

23/12/2012

Project-Team Maverick

**GigaSpace, getting started guide for Microsoft Windows**

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Project-Teams Maverick

Technical Report N° 9999 — 23/12/2012 —99 pages.

**Abstract:** This the programming guide of the GigaVoxels library.

**Key-words:** insérez ici les mots-clés en anglais



**GigaSpace, getting started guide for Microsoft Windows**

**Résumé :** This is the GigaVoxels library programming guide for developers. It is an deep insight for make benefit glorious nation of voxels worshipers.

**Mots clés :** insérez ici les mots-clés en français

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[1. Coding Rules 6](#_Toc344997370)

[2. Simple Sphere tutorial **Erreur ! Signet non défini.**](#_Toc344997371)

[3. Amplified Surface/Volume tutorial **Erreur ! Signet non défini.**](#_Toc344997372)

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1. Introduction

This is a sample document for the INRIA RT Word model. Page headers/footers are automatically updated with the information you fill in the File/Properties/Summary (Fichier/Propriétés/Résumé) box. Mandatory fields are Title and Author.

Use automatic references for sections, tables and figures. Refer to section **Erreur ! Source du renvoi introuvable.** for reference examples.

1. System Requirements

To use GigaSpace on your system, you will need the following installed:

* A CUDA-capable GPU (with at least Compute Capability 2.0)
* A supported version of Microsoft Windows
* A supported version of Microsoft Visual Studio
* The NVIDIA CUDA Toolkit (available at <http://developper.nvidia.com/cuda-downloads>)

The next two tables list the currently supported Windows operating systems and compilers.

Table 1 Windows Operating System Support with GigaSpace 1.0

|  |  |  |  |
| --- | --- | --- | --- |
| Operating System | Native x86\_64 | Native x86\_32 | Cross (x86\_32 on x86\_64) |
| Windows 7 | YES | - | YES |

Table 2 Windows Compiler Support with GigaSpace 1.0

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Compiler | IDE | Native x86\_64 | Native x86\_32 | Cross (x86\_32 on x86\_64) |
| Visual C++ 11.0 | Visual Studio 2012 | - | - | - |
| Visual C++ 10.0 | Visual Studio 2010 | YES | - | YES |
| Visual C++ 9.0 | Visual Studio 2008 | YES | - | YES |

1. Dependencies

Plus, for the Library:

Toutes les dépendances (librairies externes) dont on a besoin sont disponibles sous Ubuntu 12.4 (packages officiels) à part une seule, CUDPP. Sous Linux, les gens vont devoir recompiler eux-mêmes Cudpp (pas de package offiiciel pour l'instant). Mais il y a une ligne a modifer dans le Makefile de CUDPP pour choisir une carte graphique récente... Cyril Soler s'est proposé d'étudier la faisabilité et de m'aider à faire un package debian (installeur automatique). Sous Windows je sais faire.

1. library

Here is the list of depdendencies required for the library :

Table 3 List of dependencies for core library

|  |  |  |
| --- | --- | --- |
| Libraries | Version | Goal |
| Cuda | 6.0 | GPU computing |
| cudpp | 2.1 | Parallel algorithms on GPU |
| Loki | provided (modified) | C++ template design pattern |
| OpenGL | system | 3D library |
| glew | 1.10.0 | OpenGL extensions (OpenGl 4.4) |
| glu | system | May be removed in the future… |
| freeglut | xxx | May be removed in the future… |
| glm | xxx (0.9.5.x) | vector/matrix maths (and OpenGL 4.x) |

We provide :

LOKI

available here : http://loki-lib.sourceforge.net/

A few classes have been modified (1 or 2 classes) to be able to use tuples on GPU (for field selection in tuples).

GLM

Available here : <http://glm.g-truc.net/0.9.5/index.html>

We may use it more and more to be more OpenGL 4.x compliant in the futur

=> but maybe GLM has a developper package on Linux ?

But, you will need :

- [ OpenGL ] and [ GLU ]

- [ freeglut ]

- [ CUDA 6.0 ] . One guy uses it on Linux. It's not working on Windows, NVCC problems with C++ template...)

=> And "for the moment" we also need the "Samples" in its GPU Computing SDK (you can install it after CUDA if you hadn't done that). We rely on 1 file of the SDK for operations on float3, float4...

GLEW

http://glew.sourceforge.net/

=> check for the lastest one if you need, build it and installed (you can install it in a local directory)

You'll also need Cudpp, but wait before compiling it. I need your "graphics card" model.

- [ CUDPP ] : http://code.google.com/p/cudpp/

= > Actually, our main problem is with cudpp that you need to build. There is no package...

=> By checking website, I've just seen that a new version has been released and they pass from GoogleCode to Github...

=> IMPORTANT : I need your graphics card model to eventually change the Makefile. If you are using a SM 3.0 compute capability graphics card, you need to change the Makefile.

1. Tools

Here is the list a required tools to build the libraries, tools, etc…

Table 4 List of tools for core library

|  |  |  |
| --- | --- | --- |
| Libraries | Version | Goal |
| CMake | xxx (2.8.x) | Multi-plateforme project generation |
| Doxygen | xxx | Automatique documentation |
| 7-zip | xxx | Compression/decompression |

1. Demos / examples

Here is the list a required dependencies to launch demos :

1. Table 5 List of tools for core library

|  |  |  |
| --- | --- | --- |
| Libraries | Version | Goal |
| Qt | 4.7.4 (soon 4.5.2) | User Interface and 3D window |
| QGLViewer | 2.x.x (soon 2.5.2) | Specialized 3D window |
| Qwt | 6.x.x (6.x.x) | 2D Plots |
| Assimp |  | 3D models import |
| CImg |  | Image/texture support |
| ImageMagick |  | Image/texture support |

You will need : (on Ubuntu 12.4 all are available in standard developper packages)

- [ Qt ]

=> we use 4.7 on Linux, the one from official Ubuntu 12.4 package. We do that because, on Windows, 64 bits support had been stopped and it crashes. Maybe the Qt 5 is OK, but not in Ubuntu...

- [ QGLViewer ] : http://www.libqglviewer.com/

- assimp : http://assimp.sourceforge.net/

=> load 3D models

- [ CImg ] : http://cimg.sourceforge.net/

=> we only need the CImg.h file for image/texture support.

- [ ImageMagick ] : http://www.imagemagick.org/script/index.php

=> image/texture support.

=> don't forget to install the SDK with headers C++ files (on Windows the installer asks for it, but on Linux I don't remember, I think it's OK)

- [ Qwt ] : http://qwt.sourceforge.net/

=> plots

1. About this document

This example show the usage of a GPU producer used to generate a simple sphere.

The main themes related to volume rendering are :

* procedural geometry
* color alpha-premultiplication (to avoid color bleeding)
* shading model (lambert illumination model)

1. Installing GigaSpace Development tools

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1. System Requirements

show the usage of a GPU producer

GvIRenderer = interface are prefixed with I

int pLevel = function parameters are prefixed with “p”standing for “parameter”

int level : local parameters are left unchanged.

int pLevel = template parameters are prefixed with “T”standing for “template”

1. About this document

This example show the usage of a GPU producer used to generate a simple sphere.

The main themes related to volume rendering are :

* procedural geometry
* color alpha-premultiplication (to avoid color bleeding)
* shading model (lambert illumination model)

# Conclusion

Reference updates are not always automatic, and you may have to force a refresh. To do so, select the whole document (Ctrl+A) and press F9 (or find the equivalent in the menu). Printing the document also usually refresh all fields (including header/footer).

If you need help about this Word model, you can contact anne.bres@inria.fr.

# 

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Publisher

Inria

Domaine de Voluceau - Rocquencourt

BP 105 - 78153 Le Chesnay Cedex

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ISSN 0249-6399

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