GATE version 7.0 - 05/12/2014

General set-up and installation:

- This version is validated for Geant4 9.6.p01/p02/p03
- The compilation is validated for from gcc4.1 to gcc4.7
- It is no more needed to use system CLHEP. Geant4 embedded version now works (flag GATE_USE_SYSTEM_CLHEP=OFF by default). Alternatively, users may still use system CLHEP version 2.1.3.1 (put the flag ON).
- To download binary data for benchmark and example folders, set ON GATE_DOWNLOAD_BENCHMARKS_DATA and GATE_DOWNLOAD_EXAMPLES_DATA variables.
- For GPU features the CUDA tools are needed (see doc).

All information regarding the installation are provided by the documentation:
Generic page: http://wiki.opengatecollaboration.org/index.php/InstallationGuideV7.0
Dedicated procedure: http://wiki.opengatecollaboration.org/index.php/New_Compilation_ProcedureV7.0
GPU modules: http://wiki.opengatecollaboration.org/index.php/New_Compilation_ProcedureV7.0#GPU_.26_CUDA_tools

New developments and features:

- GPU modules for PET and CT applications. For details, read the user's guide on the section:http://wiki.opengatecollaboration.org/index.php/Users_Guide_V7.0:How_to_use_Gate_on_a_GPU. Note: technical limitations of the GPU modules are indicated in the user's guide. Read also the examples provided within the GATE sources for understanding the interests and limitations.

- Unification of navigation engine for Radiation Therapy and Imaging applications – For voxelized phantom "Regular", "Nested" and "Regionalized" navigators can be used. Details are provided in the user's guide:

http://wiki.opengatecollaboration.org/index.php/Users_Guide_V7.0:Voxelized_Source_and_Phantom#Description_of_voxelized_phantoms

- Unification of image readers for Radiation Therapy and Imaging applications. Following file formats are readable for both application fields:
  - Interfile format: header .h33 + raw image .i33 (unsigned short int)
  - Analyze format: header .hdr + raw image .img (any pixel types, not recommended)
  - MetaImage format: header. mhd + raw image .raw (any pixel types)

Details are provided in the user's guide:
http://wiki.opengatecollaboration.org/index.php/Users_Guide_V7.0:Voxelized_Source_and_Phantom#Description_of_voxelized_phantoms

- Visualization of images with OpenGL (Qt & X11). Works only in Immediate mode (/vis/open OGLI).

Details are provided in the user's guide:
http://wiki.opengatecollaboration.org/index.php/Users_Guide_V7.0:Visualization#Visualization_of_Images

- Physic list builder mechanism is available, following the Geant4 approach. For details, read the following section:
http://wiki.opengatecollaboration.org/index.php/Users_Guide_V7.0:Setting_up_the_physics#New_physics_list_mechanism

- DNA physical processes are available by using the physic list mechanism
For details, read the the file $GATEHOME/examples/example_DNA/README

- New Actor: Biological washout model for hadrontherapy applications. See: http://wiki.opengatecollaboration.org/index.php/Users_Guide_V7.0:Readout_parameters_for_Radiotherapy_applications:_Actors#Biological_Washout:_WashOutActor

- Ellipsoid shape available: http://wiki.opengatecollaboration.org/index.php/Users_Guide_V7.0:Defining_a_geometry#Creating_a_volume

- Actors manage spacing, origin & orientation when attached to mhd image (useful for dicom to mhd images).

- Visualization of central slices for voxelised images with OpenGL (Qt & X11). Details are provided in: http://wiki.opengatecollaboration.org/index.php/Users_Guide_V7.0:Visualization#Visualization_of_Images

- Several actors are available. Look into source/digits_hits/include/*Actor.hh

- Catch users signals USR2 and INFO for displaying simulation status (on linux, "pkill -SIGUSR2 Gate" will display current simulation progress).

- Fluorescence processes was corrected (see README in examples/example_fluorescence)

- Various bug fixes and improvements

Documentation updates:

Generic page: http://www.opengatecollaboration.org/UsersGuide
Dedicated wiki page: http://wiki.opengatecollaboration.org/index.php/Users_Guide_V7.0

Examples

- GPU modules: CT and PET configurations are described in the following directory $GATEHOME/examples/example_GPU
- DNA processes: How to define a simulation by using DNA processes. Details are available in this file $GATEHOME/examples/example_DNA/README