

Geometric Tools Engine Update History

Last modified: August 29, 2019

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The version release dates are listed here. Versions released before the current version may be obtained by email request.

- Version 4.1 posted August 29, 2019.
- Version 4.0 posted August 14, 2019.

The updated files and related notes are provided for the versions in each of the ensuing sections. Each section has a list of changes that occurred to the version number mentioned in that section. Those changes were rolled up into the zip file that was posted for the next version. Files in the **Include** or **Source** folder are abbreviated (file prefix **Gte** removed) for ease of reading. Modified files are colored **gold**, new files are colored **green**, and deleted files are colored **red**. Source code is colored **Violet**.

1 Updates to Version 4.0

August 29, 2019. I introduced a bug when **HeightInRange** was added to the **Cone** class. The comparison needed to be for h^2 , not h .

[GTE/Mathematics/ContCone.h](#)

August 26, 2019. The classes were missing some public-internal member functions and **std::frexp** that had been added to the GTEngine 3.x classes. Moved the public-internal member functions to public section with the other accessors.

[GTE/Mathematics/BSNumber.h](#)
[GTE/Mathematics/BSRational.h](#)

August 16, 2019. Added the ability to specify sorting of eigenvalues and eigenvectors in the noniterative solver **NISymmetricEigensolver3x3**. The sorting code was factored out of the iterative solver **SymmetricEigensolver3x3** so it can be shared by both classes.

[GTE/Mathematics/SymmetricEigensolver3x3.h](#)

August 15, 2019. The relative paths to the libraries were hard-coded in the strings for the solution files. They needed to be the pattern **_GT4_RELATIVE_PATH_**. Added post-build copies of the executables to the appropriate subfolders of **GTE/Executables**.

[GTE/Tools/GenerateProject/ProjectTemplate.{v14,v15,v16}.cpp](#)
[GTE/Tools/GenerateProject/GenerateProject.{v14,v15,v16}.vcxproj](#)

2 Version 4.0

August 13, 2019. This version is a transition from the Geometric Tools Engine version 3.x source code to the planned Geometric Tools Library code. The single library project for GTEngine has been replaced

by separate libraries. The mathematics code is in a header-only library (GTMathematics). A mathematics library with GPU-based implementations is provided (GTMathematicsGPU). The CPU-based common graphics engine code is in its own library (GTGraphics). DirectX 11 wrappers are provided for graphics (GTGraphicsDX11) and applications (GTApplicationsDX11). OpenGL 4.5 wrappers are provided for graphics (GTGraphicsGL45) and applications (GTApplicationsGL45). The file and folder organization has changed, and the Gte file prefix has been removed because of the style of header-file includes in the source code. Microsoft Visual Studio 2013 Update 5 reached the end of its product lifecycle on April 9, 2019 and is not supported by GTEngine 4. Some of Wild Magic 5 has still not been ported to GTEngine, which I will remedy with GTEngine 4.