GEF3D Creation Review

August 29, 2008

Website:	http://gef3d.org
Newsgroup:	news://news.eclipse.org/eclipse.gef3d

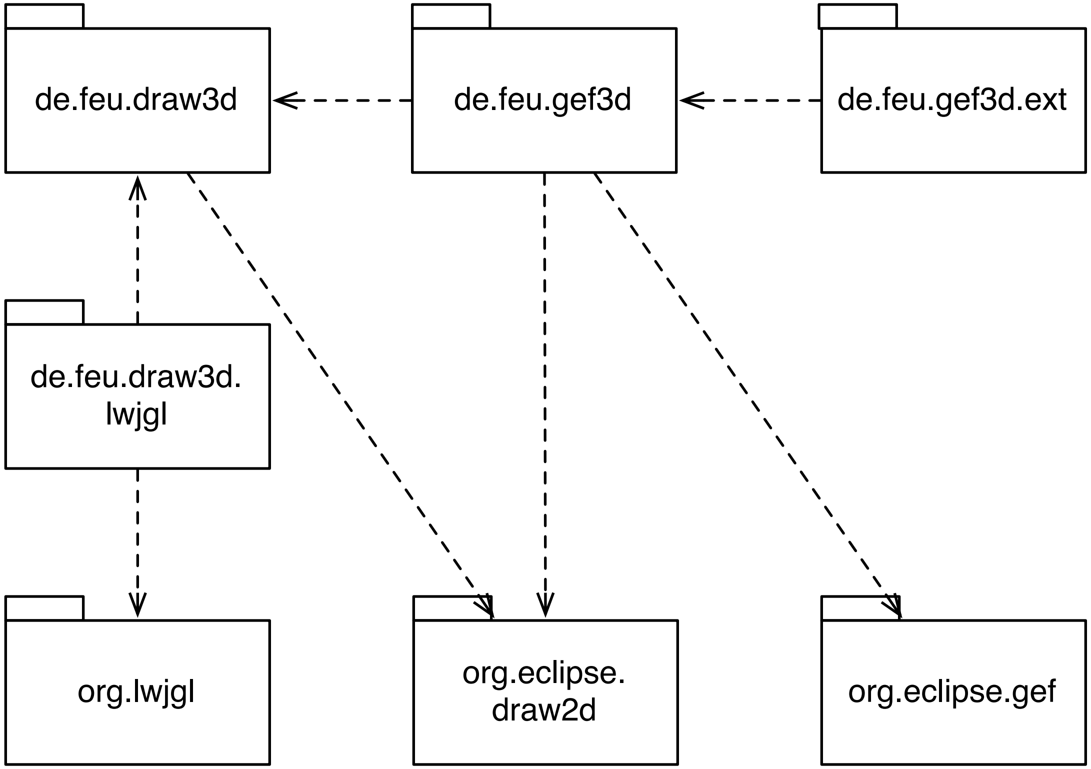
Executive Summary

- In many cases, three-dimensional diagrams become more useful than two-dimensional ones. This is true for example when inter-model (i.e. inter-diagram) relationships are to be visualized
- Many graphical editors based on Eclipse GEF already exist for two-dimensional diagrams. It is desirable to reuse (parts) these editors in three-dimensional visualizations.
- GEF3D is a framework extending GEF in order to display and edit diagrams in three-dimensional space.
- Existing editors based on GEF can be reused and their output can be projected on planes in a three-dimensional scene; multiple editors can be combined and inter-diagram connections can be visualized.
- Programming three-dimensional editors nearly becomes as easy as programming two-dimensional editors, since the original GEF design is maintained.

Goals

- Define and implement a framework based on GEF and OpenGL (and possibly other 3D renderers) which makes programming of three-dimensional editors as easy as two-dimensional
- Provide specialized 3D-related techniques (such as camera, camera tracks, picking, or transparency)
- Provide techniques for easily adapting exiting GEF-based editors as easy as possible and enable the reuse and combination of existing GEF-based editors as simple as possible.
- Enable the visualization of real-world diagrams in 3D with thousands of nodes and connections

Architecture Overview



- draw3d and gef3d provide 3D versions of corresponding 2D classifiers (in draw2d and gef); both packages provide basic functionality of GEF3D
- rendering is performed by LWJGL, other renders may be implemented
- gef3d.ext provides special patterns and techniques for combining editors or adapt existing editors

Scope

- **3D Framework:** Implementation of a GEF-based framework for enabling GEF based three-dimensional editors
- **Reuse existing editors:** Provide techniques and patterns for easily porting existing 2D editors to 3D
- **Visualization techniques:** Provide basic 3D related visualization and user interaction techniques such as camera, camera movement, or level of detail
- **Different Rendering Engines:** Provide independent components for supporting different rendering engines, e.g. LWJGL, JOGL, or exporters; LWJGL and some exporters will be provided

Out of Scope

- GEF3D will not develop any 3D-editors except example editors for demonstrating how the framework is used
- GEF3D will not develop special 3D-graph drawing algorithms
- GEF3D will focus on editors and visualizers for graph-like models, CAD or virtual reality applications are not target domains of the framework

Project Name and Position

- Full name: Graphical Editing Framework 3D
- Short name: “GEF3D”
- GEF3D will be incubated below the Eclipse Technology Project

Mentors

- Chris Aniszczyk
- Ed Merks

Initially participating parties

- FernUniverstität in Hagen, Germany

Initial Committers

- Jens von Pilgrim (FernUniversität in Hagen)
    - Jens is a research assistant at the Software Engineering Group at FernUniversität, where he is working on his Ph.D. thesis in the context of MDD. He has more than 15 years experience with OOD/OOP, in that time he has worked as developer, architect and project manager in several projects in different areas (e.g. expert systems and web-applications)
- Kristian Duske (FernUniversität in Hagen)
    - Kristian is a student at the FernUniversität and worked as a student assistant in the context of GEF3D. He is writing his thesis about GEF3D and how to visualize the models employed by GMF and their dependencies. He has been working as a Java developer for the last 8 years, mostly on web applications and client tools at various companies or as a freelancer.

Code Contribution

- Jens von Pilgrim[*] (FernUniversität in Hagen) provides an initial code contribution
- No legacy code – GEF3D was completely written from scratch; a first prototype based o Java3D was used to gain experience in this area but its code was not used in GEF3D
- Publication under EPL
- Desired namespaces: org.eclipse.gef3d; org.eclipse.draw3d
- An Java-OpenGL wrapper, LWJGL, will be contributed to Orbit. This bundle will consist of 3 plug-ins: binary, source, and documentation. The plug-in packaging is planed to be included in the build process of LWJGL

[*)]All rights on GEF3D were transfered to Jens von Pilgrim by the FernUniversität before GEF3D was made public.

Community Response & Interested Parties

- Community response has been positive
- Interested parties
  - Ian Bull (GEF, Zest)
  - Stéphane Lacrampe (Obeo)
  - Sven Efftinge (itemis)
  - Yuri Strot (Xored Software)
  - Jochen Mader (Pramari)

Relationships to other Eclipse projects

- GEF3D is based on GEF
- Work from the following projects may be port to 3D or adapted to support 3D using GEF3D:
  - GMF
  - ZEST
  - UML Tools
  - EMF Tools

Tentative Plan

- 2009-01 Version 0.9
  - Dependencies to LWJGL are reduced or removed (enabling other renders to be used instead)
  - Known bugs are resolved
  - Ecore Tools (i.e. ecore diagram editor) are ported to 3D (not part of GEF3D core development, but serves as proof of concept and maybe example)

Contact

- Use newsgroup

  news://news.eclipse.org/eclipse.gef3d

  for comments, questions, and for request that the review call be held

- Visit website

  http://gef3d.org

  for screenshots, screencasts, code and plugins