

SCEGRA

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Motivation

- First project with OpenGL
- Implement a complete scenegraph by myself, without using external libraries or code
- Understand OpenGL principles and functionalities
- Combine them with my own data-structures and algorithms

Technologies

- Language: **Java 1.6**
- Programming-pattern: **MVC**
- IDE: **Eclipse Helios**
- OpenGL-Binding: **JOGL**
- Libraries: **only Java Standard-API**

Scenegraph Structure

- Node-based tree
- Available node-types: Animation, AnimationSequence, Camera, Geometry, Object, Texture, Transformation

Scenegraph Description

- XML-based file format
- Links geometry and texture data
- Describes tree-structure
- Initializes camera
- Links bounding-tree definition

Scenegraph Output

- Scenegraph never renders directly
- Outputs RenderObjects with individual transformation, references to geometry- and texture-data
- Only visible objects are listed

Features

- Loading 3D-models
- Hierarchical transformations
- Instancing
- Manipulating objects
- Texturing and lighting
- Animation

Acceleration

- Level-of-detail (LOD)
- View-frustum-culling

The End

Have a nice day. ;)