



**All contents created by:**

Daniel Seifert  
Germany

# Avengina

## Abstract

Avengina is a Java based realtime 3D graphics engine which is designed and optimized for the execution as a Java applet. Alternatively it can be launched as a Java Webstart application outside the browser window. The software provides the possibility to exhibit texts and images in virtual galleries. Regarding the control and behaviour of the avatar it's redolent of a game engine. The graphics rendering system bases on per-pixel lighting and supports normal mapping, specular lighting and stencil volume shadows.

Note that the software still is under construction. Nevertheless you are invited to execute the official demo at <http://www.avengina.org>.

Please have a look at the developer video being available at this website too (<http://www.avengina.org/?target=comment>). On the next pages of this paper you'll find technical specifications and usage instructions.



## Technical specifications

### *general:*

- programming language: Java
- platforms: Windows, Linux, MAC OS X, Solaris
- graphics API: OpenGL
- API binding: JOGL
- hybrid architecture (applet/application)
- object-oriented design
- fullscreen support (application only)
- plugin interface (particles, object tracking etc.)
- scenegraph
- store/restore API (basing on cookie technology)
- content creation (texts/images) via textfiles
- fonts
- GUI
- tools: mapoptimizer, mapconverter (from \*.blend)

### *graphics rendering system:*

- per-pixel-lighting (basing on vertex program 1.0/ fragment program 1.0)
- dynamic geometry independent full scene z-pass stencil volume shadows
- normal mapping
- specular reflections
- smooth shading
- light coronas (billboards)
- procedural textures (e.g. normal maps); plugin architecture for textureproducers, access via Java reflection
- mipmapping
- mouse/keyboard navigation
- basic physics
- dynamic avatar collision detection
- zoom function



*adjustable/toggleable:*

- vertical synchronization
- shadows
- anisotropic filter
- bump maps
- specular reflections
- shader setup
- brightness
- full scene antialiasing (launch configuration)
- texture quality (launch configuration)

*minimum system requirements:*

- graphics card: GeforceFX (5th generation)/Radeon9500/Intel915G
- CPU: ~1.0GHz (scene dependent)
- RAM: ~256Mb (scene dependent)
- Java Runtime Environment 1.5
- fast internet access recommended



## Usage instructions

(consumer perspective)

### *standard procedure:*

- go to <http://www.avengina.org/?target=run>
- make an attempt: click on one of the 'engage' buttons (execution as applet is recommended for the first attempt, it seems to be the currently more robust version)
- now please wait a moment, if the software does not launch go on with troubleshooting

### *troubleshooting:*

- install JRE1.5 or higher if not installed
- make sure that your system matches the system requirements specified on top of the launch configurator
- see the troubleshooting table at the website (below the configurator)
- note: you can check your system at <http://mr.myogl.org>

*Please contact [ki@avengina.org](mailto:ki@avengina.org) for technical support.*