

# Realtime Rendering WS2020: Ants

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## 1 Demo

The demo runs 2 minutes and the application is automatically terminated after the demo was executed. It demonstrates the implementation of shadows with PCF, cast by a point-light, and the implementation of a GPU particle system.

The 3D scene shows a group of giant ants, that sits around a campfire. The scene is placed in the desert. Cacti and sand dunes are setting a calm mood. The twilight has come and the campfire casts the shadows of the ants on the ground. Guitar music is played in the background. The camera tilts smoothly along the scenery and the ants are wagging back and forth, while the bonfire flickers.

## 2 Description of Implementation

The prototype was implemented in C++ using the OpenGL [6] specification. We integrated GLFW to create a window and included GLEW [3] and OpenGL Mathematics [7] for the rendering. The models and obj files were downloaded from cgtrader [2] and were edited and assembled together in Maya. The chosen effects in the original documentation (Shadow mapping with percentage-closer filtering GPU particle system with 100.000 particles) have not changed for the final project. The demo was tested on an AMD RX 5700 as well as on NVIDIA GeForce GTX 1060.

## 3 Additional Libraries

The positions of the models saved in a json file and get parsed using the jsoncpp library [5]. The actual loading of the obj files is done by assimp [1] while textures are loaded from PNG using Simple OpenGL Image Library 2 [8]. The music is played using irrklang [4]. Other dependencies include GLFW, GLEW and GLM mentioned in 2.

## References

[1] Assimp. <http://www.assimp.org>.

- [2] cgtrader. <https://www.cgtrader.com>.
- [3] Glew. <http://glew.sourceforge.net>.
- [4] Irrklang. <https://www.ambiera.com/irrklang/>.
- [5] Jsoncpp. <https://github.com/open-source-parsers/jsoncpp>.
- [6] Opengl. <https://www.opengl.org>.
- [7] Opengl mathematics. <https://glm.g-truc.net>.
- [8] Soil2. <https://github.com/SpartanJ/SOIL2>.