

PROJECT #1: SPACE INVADERS 3D

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This project aims to design, develop, and code a 3D version of the game called Space Invaders, a classical arcade game (Fig. 1, for a desktop platform. This project build upon the assets and ship movement encoded in Assignment #2.



FIGURE 1. Space Invaders: (1) its 2D graphical interface (2) a typical arcade for Space Invaders. Abusively taken from https://en.wikipedia.org/wiki/Space_Invaders.

”Space Invaders is a 1978 shoot ’em up arcade video game that was developed and published by Taito (www.taito.com). Commonly considered to be one of the most influential video games of all time, Space Invaders was the first fixed shooter and the first video game with endless gameplay (meaning there was no final level or end screen) and set the template for the genre. The goal is to defeat wave after wave of descending aliens with a horizontally moving laser cannon to earn as many points as possible.” See https://en.wikipedia.org/wiki/Space_Invaders) for further details.

GUIDELINES

In the construction of this game, you need to aware of the following:

Date: Assigned: November 15, 2024; Due: January 5, 2025, 23:59; Computer Graphics, Fall 2024-2025.

- Illumination, materials, and shading. This is important to create realism and to take most of Space Invaders.
- Texturing. Texturing is also important to foster scene realism.
- Interaction. Handling your ship against enemies through input devices like a mouse or keys is a must in this project.
- Special effects and add-ons. Special effects are not required in this game. But doing that leads to extra marks in your grade. For example, explosion of an enemy ship is a special effect. An example of an add-on is a top view of the battlefield in the space.
- Novelty. Novelty in designing, developing, and coding this game is awarded with extra marks in your grade.

In case a student brings us to life a 2D version of Space Invaders, a cut of 2 out of 10 marks will affect your final grade. The entire code of the project must be written using Modern OpenGL, GLM, GLFW, and GLEW (ou GLAD).

REFERENCES

- [1] OBJ format wiki: https://en.wikipedia.org/wiki/Wavefront_.obj_file
- [2] More notes about OBJ format: <https://www.marxentlabs.com/obj-files/>
- [3] The OpenGL Shading Language <https://www.opengl.org/registry/doc/GLSLangSpec.4.40.pdf>, last access on 08/04/2015.
- [4] Dave Shreiner, Graham Sellers, John Kessenich, and Bill Licea-Kane. OpenGL Programming Guide, 8th edition, version 4.3. Addison-Wesley, Upper Saddle River, 2013.
- [5] D. Wolff, OpenGL 4 Shading Language Cookbook, Packt Publishing, 2018. See 2nd edition code at <https://github.com/daw42/glslcookbook>
- [6] GLSL: https://www.khronos.org/opengl/wiki/OpenGL_Shading_Language
- [7] GLFW documentation: <https://www.glfw.org/documentation.html>
- [8] GLM code and documentation: <https://github.com/g-truc/glm>