



GAME2012 – 3D Graphics Programming

Final Project

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See D2L for due date

This project is the last deliverable as there is no final exam in this course. You will be able to work in groups of no more than three, and how you divide the work will be obviously up to you. Along with the submission of your project through D2L, you will also have to either present for a few minutes during your lab in Week 15 or record a brief 5 minute video demonstrating all aspects of your completed project.

Start Project

You can use any starting project that we have provided for you in this course and this project covers every topic we've delivered - including those to come in later weeks such as lighting - so plan accordingly. Don't leave until the final week.

Project Goal

In this project, you will be implementing everything we learned so far in order to design and render an FPS level in OpenGL. Possible reference levels for this project are referred to as shoot houses and are used for police and military training. Your project theme can be anything you like, however, but there will be some design criteria that you must follow. Some shoot house blueprints are rather large and intricate, but what I expect from you will be much simpler.

Blueprint (3 marks of a separate submission)

You have been provided a large grid image on which to design your project. Using any image editing software (free or otherwise), you will be provided to "draw" out all geometry for the level in top-down format. You will be required to submit this blueprint in a week or two after this outline becomes available on D2L. The blueprint will likely be its own assignment item on D2L. While details

will follow, your level must contain one large building that is divided into two parts: a front office and a large warehouse behind it. You can search “warehouse blueprints” and “shoot house blueprints” for ideas. I will provide feedback on your blueprint. While these sections are required, the theme can be anything.

Also, your final implementation must not deviate too much from this design. This is the point of having a design.

Map Walls and Details (5 marks)

A shoot house is made of various 90-degree twists and turns in order to hide potential dangers for the team. Using the office and warehouse layout, you will be required to follow your design and implement vertical walls of various lengths and types but you do not need a roof at all.

You will have a lot of freedom in your design, but you should do research on the specific references I've mentioned. You don't need to create the property grounds around this building, but you can add anything you like to spruce up the level. Criteria for the walls is as follows:

- You should have a combination of different types of walls, including some with a doorframe and even interior windows that look into other rooms
- Ensure there are a few rooms of different sizes for the office part of the level, so you should include at least one or two hallways
- The key will be to create and reuse wall segments using the provided shape generator that we will go over in Week 11
- The warehouse should have columns or pillars that would keep the roof up, but you don't need a roof. These pillars will instead offer some cover

Props and Pickups (3 marks)

The mandatory criteria for the props and pickups are as follows:

- Examples of props would include different types of crates or containers strategically placed mostly in the warehouse that serves as cover
- For the office, you don't need to include chairs or tables, but you should include a simple rectangular shape for a filing cabinet or shelves. You should be able to find 2D textures for it
- If you opt for the shoot house route, your pickups could be 2d cutouts of hostages, and in any other case, it's up to you to decide what your pickups are. For the collision check itself, you can simply just use a distance check

Shapes and Textures

Minimum Shapes Required

- Cube
- Prism (of all different sides)
- Cone

Minimum Textures Required (all as per your theme)

- 2 different wall textures
- 2 different floor textures
- Multiple object/prop textures
- Texture for your “pickup” objects

Lights, Camera, Action! (4 marks)

You need to deploy a few light sources but in the interest of time, no physical light sources will be required. You need a few **point lights** and **ambient light** and you don't need different colors unless you want them. You need one **spotlight** too. **(3 marks)**

Make sure that your camera is in perspective mode and can be controlled as a **first-person camera** like the Midterm. We've set this up for you pretty much with examples, but just for clarification: **(1 mark)**

- A and D would strafe left and right
- W and S would move forward and backwards along the forward vector
 - You can choose to keep the camera on the ground or if rotated upwards, allow it to move diagonally up - it's up to you
- R and F should still move up and down (the world Y) just for debug purposes so we can see an overview of your world - this is mandatory!
- Mouse movement will rotate the camera look at - you can use our mouse click and rotate example
- Q and E for rotation like the Midterm

Aesthetics/Variety (3 marks)

To be as objective as I can for this criterion, just put some **pride and effort** in and have your environment look polished and worthy to be in a game. Or, at least have some **variety** in your build and **realistic proportions and it fits your theme**. You can check with your instructor to see if it looks polished.

Presentation or video (2 marks)

You need to either make (at least) a **5-minute** video showing all aspects of your submission or present during your lab section. This includes going over **code** and a **flythrough** of your build. Only one group member needs to present.

Project Weight: 20% of course grade

Task	Possible Marks	Description
Submission 1		

Blueprint	3	You submitted a proper blueprint
Submission 2		
Map Walls	5	You created the walls of the map properly
Props/Pickups	3	You created the props and pickups properly
Lights & Camera	4	You created the lights and camera properly
Aesthetics/Variety	3	You castle has variety of shapes and realistic proportions
Video/Presentation	2	Video or in-lab presentation at least 5 minutes long
Total:	20	

Submission Details:

- If have a hidden .vs directory, delete the .db file and any AutoPCH folders
- Submit through Final Project link ONLY
- If working in groups no larger than 3, ALL members must submit the same thing
- Naming convention:

GAME2012_Final_LastnameFirstmane.zip (or .7z or .rar)

or

GAME2012_Final_Lastname1Lastname2Lastname3.zip (or .7z or .rar)

Penalties:

- You didn't use Hooman's template: **0% for submission**
- You only have a template that we provided and no extra code: **0% for submission**
- You coded it in any language other than C++ with OpenGL (with perhaps SDL too): **0% for submission**
- You still have a hidden .vs path in your submission: **-1 mark off submission**
- Wrong naming convention: **-1 mark off submission**
 - So make sure you take 10 seconds and rename it!