Abstract

Hiring Assignment

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About this Document

Congratulations to getting this far in our hiring process. We appreciate your willingness to complete an assignment as part of your hiring process. This document details your task assignment process as well as additional information regarding the work that you're completing under the assignment.

Assignment

Start and Duration

The available time for the assignment is two days with up to 8hrs per day, the results should be delivered by noon on the third day.

Complexity and Scope

The assignment is very complex, and you are not expected to finish 100% of it. However, it is important for us to understand how you can solve a medium-sized assignment in a self-organized manner and how far you will get with the task. Keep in mind that function, code quality as well as code-level documentation will be reviewed.

Working on the Assignment

This document is stored in a GIT repository (the "*Assignment Repository*"). While working on the assignment, you're expected to regularly commit changes to the Assignment Repository. We expect code commits in one- or two-hour intervals.

Hand-off

Your work needs to be handed over to your HR manager before noon on the third day in your local time. The Assignment Repository should be zipped and handed over to by sending it to HR@TheAbstract.co as an attachment or downloadable URL.

Ownership

It is very important to understand that the ownership of any code created as part of this assignment will remain your intellectual property. We will only use your code to evaluate your technical fitness for the role you're applying for. The data you've sent to us will be destroyed within five (5) business days upon receiving the data.

Your Assignments

This section provides a description of your assignments. Please assume that no additional information can be provided, and you are supposed to make decisions as to how to implement or solve some issues on your own account.

3D Programming

The assignment is to implement a deferred renderer that is capable of rendering 3D primitives, several colored point-light sources and a white single spotlight.

The point-light sources are not casting shadows. The spotlight should cast a filtered shadow.

Additionally, a decal projector should be implemented that projects an image onto several primitives in the scene that modifies the G-Buffer's BaseColor and Normal buffers.

The camera should be movable by moving the mouse and translatable in the scene using the arrow keys or a typical WASD-configuration.

Scene lighting can be rendered by integrating either the Phong shading model or a physically-based shading model with a metalness/roughness workflow.

If you're familiar with the QT framework, it is appreciated if the assignment is completed while leveraging the QT framework using the `QOpenGLWidget` class. The assignment should be completed with QT5.12 or later and QT Creator. The OpenGL version must not be higher than 4.1.

If you are not using QT, the assignment should be completed with either Xcode 11 or later, or Microsoft Visual Studio 2015 or later.

The 3D framework should be one of the following: OpenGL not higher than 4.1, DirectX 11 or later, Vulkan or Metal. For fast application and context setup a helper library such as *GLFW* can be used.