Project Proposal for

Camera View with 3D Projection

From

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This proposal is to initiate my project which is to perform multiple camera views with 3D projection in computer graphics.

Summary

I had an internship in a surveillance camera systems company and found out that it is a very difficult task for the customers to select right cameras for their environments. Every camera has its own specifications in terms of the focal length and the field of view they are significantly different. Furthermore, the measurements of the installation environments are also different. So, in many cases, they return the security cameras because the camera view is totally different from their expectation. This application simulates these environments and it can reduce the trial and errors in selecting the right camera products.

In computer graphics, the view frustrum is playing an important role. It displays the field of view originated from the perspective of virtual camera system. With the view frustrum, you can simulate the modeled world that appears on the screen.

There have been previous studies to maximizing the utility of the view frustrum. There is a method of computing a view frustrum for a 3D object with a given viewpoint [Low et al. 2003]. Several 3D rendering techniques have been developed, and there are also studies about developing the view frustrum considering the oblique point of view as well [Lengyel, 2004].

Although there are lot of computations and paper works regarding the development of the view frustrum for a 3D object, it is not utilized for the industries and clients well. I believe this project could facilitate the users and industries to feature their camera view with better computed view frustrum.

Overall Goal

The overall goal for this project is to implement and perform a camera view over the human-like object with 3D projection.

Goals

To achieve the overall goal of this project, I have listed intermediate goals and final goals:

<u>Intermediate Goals</u>

- Display two windows

- Enable the program to take inputs
- Enable the program to load obj file to display a human-like object
- Enable the program to change its input values by key
- Simulate room environment with given inputs: room size (width, height, and length)
- Simulate two different views from each window

Final Goals

- The program should be able to simulate room and camera view with given inputs
- The program should be able to simulate room and camera view when user changes the input by key.