Homework #03: Modeling & Navigating Your Studio

Computer Graphics
School of Software
College of Computer Science, Kookmin University

Abstract

In this assignment, we implement a program written in Moden OpenGL (i.e., OpenGL 2.x or higher) using shaders, in order to modeling and navigating a virtual world.

Fig. 1. Your furniture: a desk (top-left), a fan (top-right), a sofa (bottom-left), a TV set (bottom-right).

1 Introduction

Let's assume that you investigate a studio for living nearby the Kookmin University. Yesterday, you finally found a lovely studio and made a contract with the householder. Today, you try to decorate your studio with the following furniture; a desk, a fan, a sofa, and a TV set.

2 Modeling

Now, you place each object with the following sequence of transformations.

- Desk
  - Scale: $(\times 1.5)$
  - Translate: $(-5, 0, 0)$
- Fan
  - Scale: $(\times 1.5)$
  - Rotate: continuously rotating along with $(0, 1, 0)$
  - Translate: $(0, 5, 0)$
- Sofa
  - Scale: $(\times 1.5)$
  - Rotate: 180 degrees along with $(0, 1, 0)$ direction
  - Translate: $(0, 0, 5)$
- TV set

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- Scale: $(\times 2.0)$
- Translate: $(0, 0, -5)$

You have to update the provided template codes in order to place the furniture in the right places. In the template codes, the functions about loading and displaying each model are already implemented. As a result, in this part, you just concentrate on specifying the correct transformations in your codes.

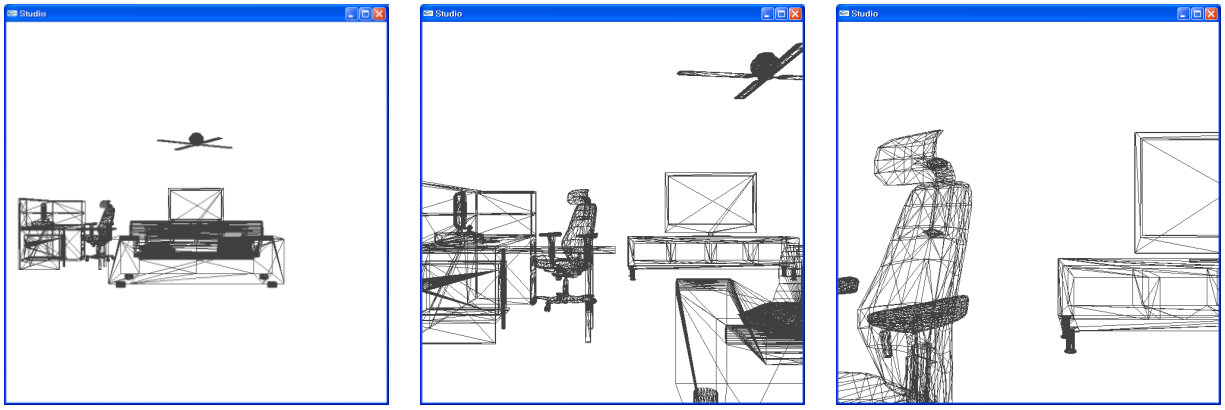
3 NAVIGATING YOUR STUDIO

Now, you look around your studio after you decorate it with the furniture. Let's assume that, in the beginning you are standing on the origin of the world coordinate system. Your eye is on (0,2,0), and your front (or viewing)-direction is –z direction, and your-up direction is +y direction.

The following is the buttons for the navigation (similar to FPS game).

- ↑: you step forward to your front direction
- ↓: you step backward against to your front direction
- ←: you step to the left with respect to your front direction
- →: you step to the right with respect to your front direction
- a (or A): you change your front direction by rotating yourself to the left
- d (or D): you change your front direction by rotating yourself to the right

4 SAMPLE RESULTS



5 DEADLINE AND MISC. (EXTREMELY IMPORTANT!!!)

- This assignment can be accomplished in a team, typically composed with 1 or 2 people.
  - Caution 1: Once you have a team, you cannot change it until the end of the semester.
  - Caution 2: Only one of your team members submits your homework.
- Your homework must be submitted to 가상대학, until 23:59 on May. 29.
- You should compress the followings into a **tar.gz** or **zip** file whose name is OOOOOOOO_HW03.tar.gz (OOOOOOOO should be your student ID).
  1) Your source files
  2) Makefile
  3) README.txt file, including the student numbers of the team members.
- **Your source codes must be complied with a make command in Ubuntu 16.04 LTS.**
- If you ask some questions to me, please utilize the office hours. It is also fine that you contact T.A. for asking some questions about the homework.