

# CS4204 Computer Graphics Fall 2007

## Project 2 – 3D Robot Modeling Tool

### Due Dates

Project 2 is due on Monday, 10/29/2007 11:59pm.

### Introduction

In computer graphics, hierarchical modeling is widely used for designing a virtual 3D character. The design normally includes articulated body design, lighting material design, texture mapping and body pose design.

In this project, you need to write a program to model or design a human-like robot, which will be used in Project 3 for character animation.

This project is designed to be finished by **one person team** only.

Your 3D robot character should have all of the following features.

### Features of the Robot character

Your robot character should have the following body parts: (18 points)

- Torso: Should have at least two parts torso. Upper torso and lower torso.
- Pelvis (Optional)
- Left and Right leg: Each leg should have at least two parts, upper leg and lower leg.
- Shoulder (Optional)
- Left and Right Arm: Each arm should have at least two parts, upper and lower arm
- Left and Right Feet
- Left and Right Hand
- Neck (Optional)
- Head

To make your Robot character look good, you should include the following features for your Robot character: (16 points)

- Each body part should have its own OpenGL lighting material property.
- Each body part should have its own texture.
- Each body can be a simple 3D primitive or a complex 3D mesh (Optional).

### Features of the program

Your program must contain all of the following features: (47 points)

- The scene should also include a floor and a visualized 3D coordinate system. (5 points)
- You should be able to use the mouse to change the view angle, zoom in-and-out and pan the camera. (Pan, Zoom and Rotate) (10 point)
- You should be able to change the body pose using mouse to change every joint angle between body parts. (8 points)
- Your program should be able to save your robot pose (including geometry shape, light material, texture and joint angle) into a file, whose format is defined by yourself. (12 points)

- Your program should also be able to load the saved file (designed by the previous feature) to display the designed robot pose stored in it. (12 points)

## What to Submit

Put your solution in one or more C++ source files. The main file (which includes function main {}) should be named `project2.cpp`. Send all source files in a zip file to your TA, Sean Ponce, via email [ponce@vt.edu](mailto:ponce@vt.edu). Please also include a description file, called "descriptions.txt" that describes how to use your program.

Also submit one or more files that can be loaded into your program to display your robot pose design.

## Grading

Your overall grade will be based on the following:

- (81 points) Completion of the feature list.
- (5 points) How easy to use the GUI.
- (9 points) How complex and interesting (in art sense) your robot pose is.
- (5 points) How good is your descriptions.txt file?
- You will get 5 more points for each optional features.