

# CS4204 Computer Graphics Fall 2011

## Homework 4 – 3D Robot (Programming)

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### Due Dates

Homework 4 is due on Tuesday, 04/05/2011 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 homework, you need to write a program to model or design a human-like robot, which will be used in your next project for character animation.

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, 2 points for each part)

- 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: (10 points)

- Each body part should have its own OpenGL lighting material property. (5 points)
- Each body part should have its own texture, or some body parts share the same texture. (Make sure you have at least two different textures on the body) (5 points)

### Features of the program

Your program must contain all of the following features: (22 points)

- The scene should also include a floor. (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. (7 points)
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### What to Submit

Put your solution in one or more C++ source files. The main file (which includes function main {}) should be named `homework4.cpp`. Upload all source files in a zip file onto the dropbox in the class scholar site. Please also include a description file, called "descriptions.txt" that describes how to use your program.