

## Introduction to Augmented Reality

### Exercise 12 (P,H) OpenGL: Primitives

As drawing boxes all the time quickly tends to become boring, we will now build a snowman. Use `drawSphere` commands to build the body and `drawCone` for the nose (Use provided header file in Moodle). Remember to change the `modelview` matrix between calls - the transformations affecting a primitive are all transformations called *before*, in *reverse* order (when thinking in terms of a single world coordinate system).

*Note:* it may be useful to save and restore your current matrix with `glPushMatrix` and `glPopMatrix`.

### Exercise 13 (P,H) OpenGL: Lighting

To make the snowman look more realistic, add some lighting to the scene. Use `glLightfv` to set the three lighting parameters `GL_POSITION`, `GL_DIFFUSE` and `GL_AMBIENT` for the first light source. Don't forget to enable the light source and lighting in general with `glEnable`.

### Exercise 14 (P,H) GLFW: Animation

Finally, let's make the snowman spin. In order to increase the rotation angle periodically, use `glfwGetTime()` to get a timestamp and convert it into dynamic angle.

Example of how it should look in the end:

