Assignment 3
CMSC740, Fall 2008
Due: 9:30am Thursday, October 30, 2008

Your goal in this assignment is to make shadows, motion blur, reflection, and dust animation for the chickens as shown in the figure and the reference executable on the assignment web page. Refer to the demo version to resolve any ambiguities that might have remained in the description below.

(a) Draw hard shadows for the chickens on the track using shadow projection with the light direction of \((0.1, -1.0, 0.1)\). \((3 \text{ Points})\)

(b) Animate dust using \(dust.png\) texture in a cyclic manner as follows:
   - In the first frame of the cycle, position the \(dust\) texture with appropriate scaling, rotation, and translation behind each chicken. \((1 \text{ Point})\)
   - In subsequent frames progressively increase the size of the texture while decreasing the alpha value of the texture until the texture is almost transparent. Repeat the cycle. \((2 \text{ Points})\)
You can use \(loadpng.h\), \(loadpng.cpp\) and \(loadpng_example.cpp\) for loading PNG images.

(c) Reflection mapping on the fence. \((3 \text{ Points})\)
   Due to slow performance, the reflection range is limited to where the leading chicken runs.
   - Draw the fence with \(GL\_FILL\) and \(glColor4f(1.0f, 1.0f, 1.0f, 0.5f)\).
   - Render to the virtual plane, which is an approximation to the fence near the leading chicken, and read pixel data from the back buffer to a texture.
   - Map the texture to the fence. The leading chicken should be shown in the reflective range of the fence.

(d) Implement the following keyboard functions. \((1 \text{ Point})\)
   - ‘R’ or ‘r’ for toggling reflection.
   - ‘C’ or ‘c’ for toggling camera between the user controllable camera in the Assignment 1 and the automatic tracking camera in the assignment 2.