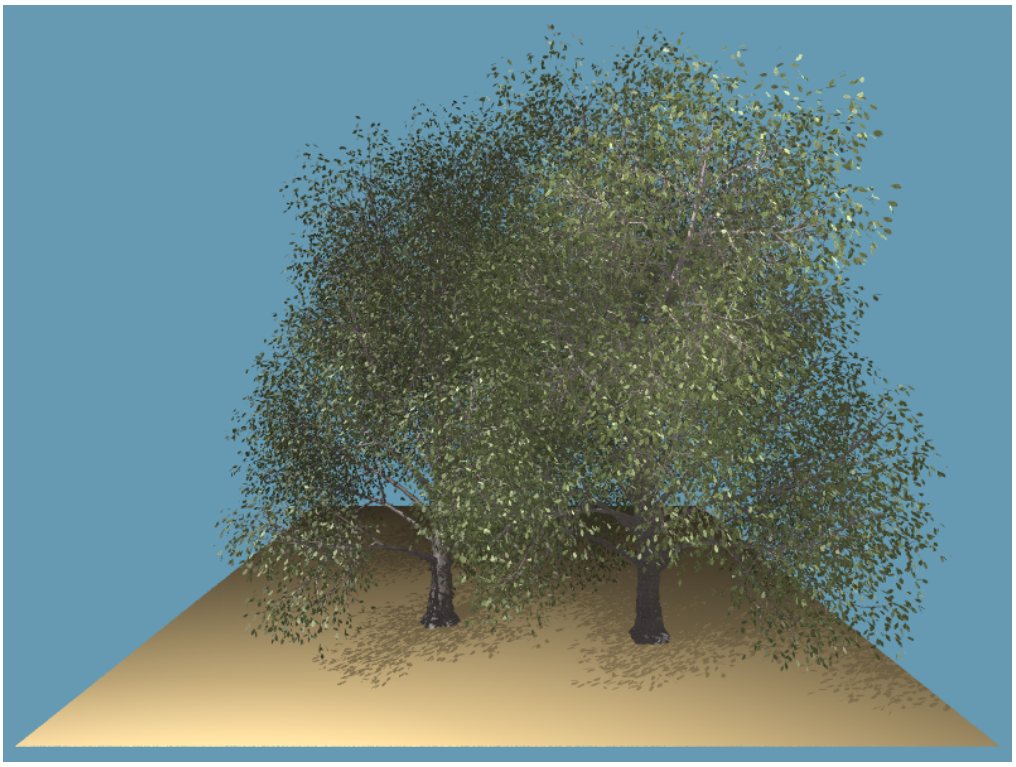
CPSC 212 Optional - Extra Credit Project 3: Forest RT, Phase 3



Modify your Phase 2, C++ ray tracer to generate an entire forest by using multiple instances of the same tree model with different rotations applied to their bounding box structures. In the image above, the two trees are actually the same tree model (beech.obj) with different rotations and translations. Only one copy of the model is loaded/stored.

- The default scene produced by your ray tracer must include at least:
  - one light to cast shadows
  - a plane segment that captures the shadows
  - 12 trees, with at least one tree of each of the three types (beech, maple, catalpa) found on the class web site.
- The code must be in C++ rather than purely in (the subset) C. In particular, no “structs” or function pointers or unions are allowed. Vector (point) operators must be overloaded, and derived classes of a generic Object class, with inheritance, should be used for both textured and non-textured triangles. Texture types P7, which allow for transparency and hence leaf cutouts, and P6 (opaque) must be supported.
- All tree triangles must be contained in a bounding box. The triangles within the box must be structured as a kd tree to accelerate ray-triangle intersection testing.

- Only one instance of each tree model may be stored in memory.

Again you may work in teams, where team size ≤ 3.

Your code will be graded on several components:

- quality of the image; in particular, no image = no credit
- readability of code
- speed
- space efficiency

The project is due Monday, December 8^{th} 3:00 pm. Mail code and execution instructions, as a single .tar file, to geist@cs.clemson.edu. DO NOT USE THE "HAND-IN" FACILITY. DO NOT USE THE "HAND-IN" FACILITY. DO NOT USE THE "HAND-IN" FACILITY.