Extra Credit Projects

Purpose -- To Raise Grades

- *C* and *D* students can raise their final grade by as much as one full grade:
  $D \rightarrow C$ or $C+ \rightarrow B+$ depending on degree of difficulty.
- *B* students can raise their final grade by as much as 2/3 of a grade: $B- \rightarrow B+$
- *A* students can raise their final grade by as much as 1/3 of a grade: $A- \rightarrow A$
- Graduate Students -- Required for 560 Credit

Due Date

- December 14 -- Noon

Policies

- Work Alone for Easy Projects
- Work with Partners for Difficult Projects
- Inform Instructor and Labbies of Your Intentions in Advance
- Submit Short Description in Advance -- At Least 1 Paragraph at Most 1 Page

Possible Projects	*Degree of Difficulty*
1. Fractals in 2–D -- Mandelbrot Set and Julia Sets	Easy
2. Fractals in 3–D -- Ray Tracing IFS	Medium
3. Radiosity -- Color Shaded Images	Difficult
4. Wavelets -- Data Compression	Medium
5. Solid Modeling -- CSG Models with Torus	Medium
6. Ray Tracing Inside 3–D Manifolds	Medium/Difficult
7. Relativistic Ray Tracing (See References) • Aberration -- Direction/Shape • Doppler Effect -- Color • Searchlight Effect -- Brightness	Difficult

Possible Projects (continued)	*Degree of Difficulty*
8. Simple Games in 2–D or 3–D	Depends on the Game
9. Turtle Projects -- Turtle Book Chapters 5-9	Depends on the Project
10. Turtles on the Sphere and/or Cube	Medium
11. Turtle Fractals on the Sphere	Difficult
12. Design New Ceiling for Duncan Hall	Depends on the Design
13. Animation	Depends on the Animation
14. Texture Mapping	Easy
15. Two Dimensional Cellular Automata	Easy/Medium

16. Shape Modeling Using Recursive Subdivision Techniques — Depends on the Models
    - Subdivision Curves and Surfaces

17. Bezier Curves and Surfaces — Medium/Hard
    - De Casleljau Evaluation Algorithm
    - De Casteljau Subdivision Algorithm
    - User Interface with Moveable Control Points

18. B-splines Curves and Surfaces — Medium/Hard
    - De Boor Evaluation Algorithm
    - Knot Insertion Algorithms
    - User Interface with Moveable Control Points

19. IFS Fractals on the Sphere — Medium
    (Reinterpret rotation, trans, and scl for sphere)

20. Kaleidoscopes (Ball, page 154) — Medium

21. Others Projects of Your Own Choice — Depends on the Project