WebGL and Education

Ed Angel
Professor Emeritus of Computer Science
University of New Mexico
angel@cs.unm.edu
www.cs.unm.edu/~angel

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Overview

- Textbook: Angel and Shreiner, Interactive Computer Graphics, Seventh Edition
  - First edition 1996
  - Introduced top-down approach with OpenGL
  - Over 250 US adoptions
- SIGGRAPH courses (SIGGRAPH U)
- Coursera MOOC
- Also Eric Haines' three.js Udacity MOOC

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Difference in Perspective

- Key topics in a university course
  - **Geometry**
  - **Representation**
  - **Coordinate systems and transformations**
  - **Projection**
  - **Lighting and shading**
  - **Rasterization**
  - **Texture mapping**
  - **Interaction**

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Three Major Transitions

- 1997: fixed function OpenGL
  - OpenGL + GLUT + GLEW
- 2011: shader-based OpenGL
  - Major change for instructors
  - CORE profile incompatible with GLUT
- 2014: WebGL

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My Experience (academic)

- WebGL is big winner
- Runs everywhere without recompilation
- Uses local resources
- No other libraries needed
- Easy to support instructors
- Startup slower but huge benefits later

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But there are issues

- JS
- HTML, CSS, jQuery,……
- Brower inconsistencies
- Unclear where WebGL fits in
  - Why not three.js?
- Books and websites often not helpful
- MOOC audience very different

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Future

- No question that for educational purposes, WebGL is big winner for CS/CE course
  - As is three.js for CAD courses
- Waiting for ES6