some recent graphics research to inspire final projects

bryan klingner (klingner@cs)
Procedural Modeling of Buildings - SIGGRAPH ‘06

Production process:
- Rule-driven modification & replacement of shapes
- Iteratively evolve a design by creating more and more details
- Sequential application (like Chomsky grammars)
Procedural Modeling of Buildings

Automatic Photo Pop-up - SIGGRAPH '05

Automatic Photo Pop-up - SIGGRAPH ‘05

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Automatic Photo Pop-up
D. Hoiem  A.A. Efros  M. Hebert
Carnegie Mellon University
Salience-Preserving Color Removal - SIGGRAPH '05

Amy A. Gooch, Sven C. Olsen, Jack Tumblin, Bruce Gooch.

Problem: Isoluminant Colors
Physically-Based Animation and Modeling

- Most things in graphics are animated by humans
- Some things--like smoke, fire, and liquid--are too complex to feasibly animate realistically by hand
- Instead, we use physical models of fluid flow, fracture, etc, cut corners, and render the result.

"A Method for Animating Viscoelastic Fluids"
Tolga G. Goktekin
Adam W. Bargteil
James F. O'Brien

ACM SIGGRAPH 2004
University of California, Berkeley
Fluid Simulation with Dynamic Meshes

Bryan Klingner
Bryan Feldman
Nuttapong Chentanez
James O'Brien

University of California, Berkeley

Simultaneous Coupling of Fluids and Deformable Bodies

Nuttapong Chentanez
Tolga G. Goktekin
Bryan E. Feldman
James F. O'Brien

University of California, Berkeley
Fast Separation of Direct and Global Components of a Scene Using High Frequency Illumination - SIGGRAPH '06

Fast Separation of Direct and Global Components of a Scene Using High Frequency Illumination - SIGGRAPH ’06

- =
- =
direct
scene
global
Fast Separation of Direct and Global Components of a Scene Using High Frequency Illumination - SIGGRAPH ‘06

- =
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direct

Real-time Fun

- Deformations
- Ambient Occlusion
- Soft Shadows
- Fluid Flows
Meshless Deformations Based on Shape Matching - SIGGRAPH ’05

Precomputed Ambient Occlusion for Character Skins - SIGGRAPH Sketch ’06

Real-Time Ambient Occlusion for Dynamic Character Skins
Paper 1104
Real-Time Soft Shadows in Dynamic Scenes using Spherical Harmonic Exponentiation
Zhong Ren, Rui Wang, John Snyder, Kun Zhou, Xinguo Liu, Bo Sun, Peter-Pike Sloan, Hujun Bao, Qunsheng Peng, Baining Guo. To Appear in ACM SIGGRAPH 2006.

Model Reduction for Real-Time Fluids
Trusilov, A. Lewis, A. Popovic, Z.
ACM Transactions on Graphics 25(3)