

COMPSCI 715 Part 2

Revision Lecture

GPU Programming

- Background to shaders
- GPU architecture
- The GLSL Language & structure

Before the Exam

- I am in email contact: nathan@serato.com
- I will be on Level 4 on the Friday morning prior to the exam (November 2nd) 9-10am

Holographic Textures

- Tangent Space
- Normal Mapping
- Parallax Mapping
- Parallax Occlusion Mapping

GPGPU

- General Purpose GPU Programming
- Rationale
- Techniques:
 - Map, Filter, Gather, Scatter
- Virus Pattern Matching

Particle Systems

- Basic Particle Systems
- Methods of representation:
 - Points, Billboards etc.
- ODE Solvers:
 - Euler, Midpoint, RK4
- Stateless & State-preserving systems
- GPU Implementation

Rigid Body Mechanics

- System of equations
- Collision Detection & Resolution
- Particle Based Implementation

Advanced Ray Tracing

- Bounding Volumes
- Vista Buffers
- Light Buffers
- Space Subdivision
- Distributed Ray Tracing

Lighting and Materials

- Gouraud Shading
- BRDFs
- Lambertian
- Blinn-Phong
- Microfacets
- Cook-Torrance Model
- Oren Nayar Model

Global Illumination

- Radiosity & Diffuse Interreflections
- Photon Mapping
- Irradiance Caching
- On the GPU

Non Photo Realistic Rendering

- Edge Rendering
- Gooch Shading
- Cell / Barla Shading
- Paint Effects
- Team Fortress 2 Lighting Model