



Summary



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Project marking

- **Send in report and optional video**
- **I will read reports, check code and send you a final mark**
 - **If I need anything I'll email**

Exam

- **Monday, January 8, 08:00-13:00 in MA 10J**

What's on the exam?

- Lectures
 - Graphics Hardware Notes
- Programming assignments (OpenGL)
- Old exams on web page
 - Similar to EDA075 exams (see web page)
 - But no material on Mobile Graphics or OpenGL ES 2.0

Course Topics

- Rasterization
- Ray Tracing - Assignment
- Texturing
- Shaders and PBS
- Deferred Shading - Assignment
- Performance Analysis and Z culling
- Depth Compression
- Texture Compression
- Anti-aliasing
- GPU Architecture
- OpenCL

Rasterization

- Edge functions
- Pixel sampling - Sub-pixel coordinates
- Traversal
- Interpolation
 - Barycentric coordinates
 - Perspective-correct interpolation

Ray Tracing

- Whitted Ray Tracing
- Shadows, reflection, and refraction
- Ray definition
- Supersampling
- Ray-Triangle Intersection
- Assignment 1

Shaders, PBS, Deferred Shading

- Physically Based Shading
- Non-photorealistic Rendering
 - Silhouettes
- Refraction, Fresnel
- Skin (wrap, shift, depth map)
- Ambient Occlusion
- Assignment 2 - Geometry Buffer, Spotlight, Shadow Mapping, PCF

Performance Analysis and Z culling

- Rasterization equation, overdraw, depth complexity
- Zmin & Zmax culling, computing, updating

Compression, Texture & Anti-aliasing

- Depth Compression
 - Caching, Depth Offset, Plane Equation
- Texture
 - Texture filtering, minification, magnification, mipmapping
 - Texture Compression
 - Principals, S3TC
- Anti-aliasing
 - Principals

GPU Architecture

- Difference to CPUs
- Unified Shader
- GPU latency hiding
- Tiled Graphics Architectures
- OpenCL

Questions?

Masters Thesis in Graphics

- Latest topics in Real-Time Rendering
- Group Research
 - Realistic rendering, Real-time ray tracing, Neural Rendering
 - check out graphics.cs.lth.se publications
- Company (when available)
 - Games - DICE, EA SEED, MASSIVE
 - ARM, AXIS, NVIDIA, AMD