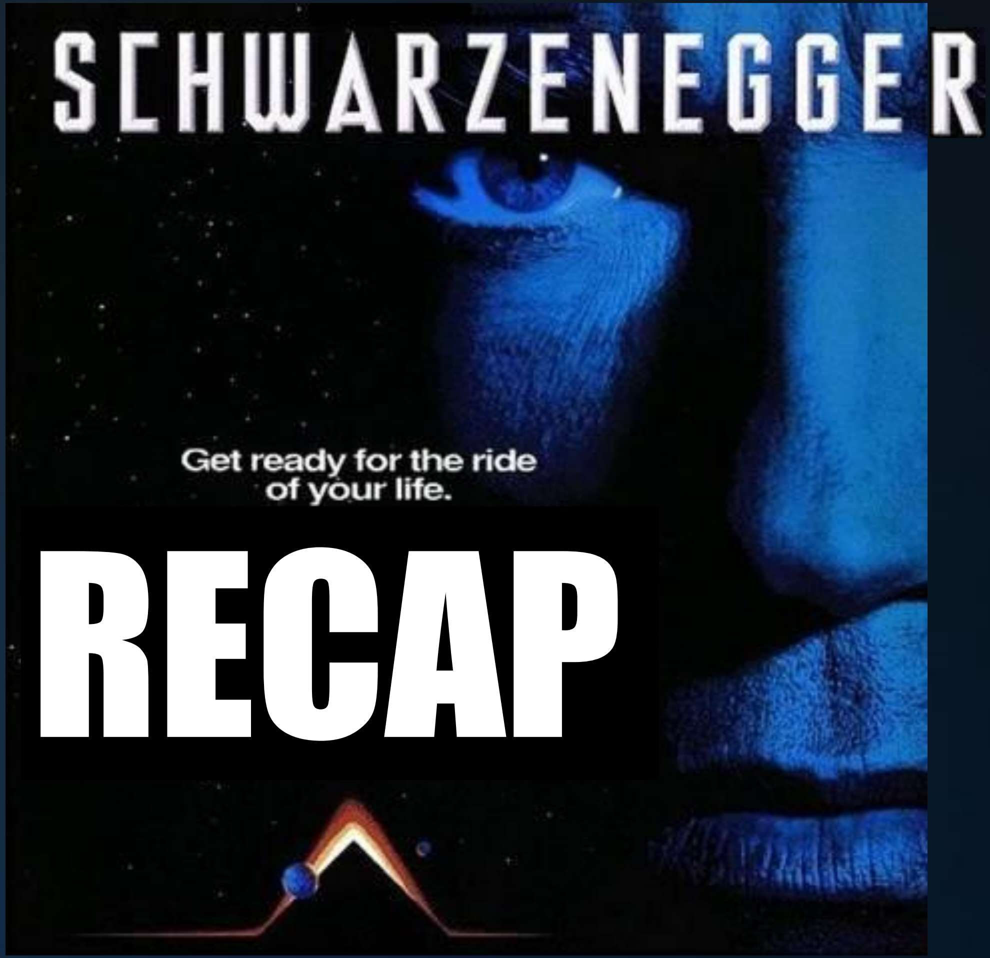
TOTAL RECAP



INFOGR – Computer Graphics

Jacco Bikker & Debabrata Panja - April-July 2017

Lecture 15: “Grand Recap”

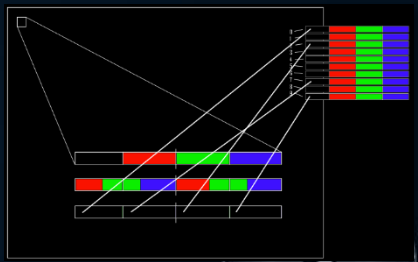
Welcome!

RECAP

Lecture 1: Rasters, Vectors, Colors

Concepts:
Raster, discretization, anti-aliasing, rasterization, frame rate, vertical retrace, ‘frame-less’, RGB colors, 16-bit, palletized, HDR.

Questions?

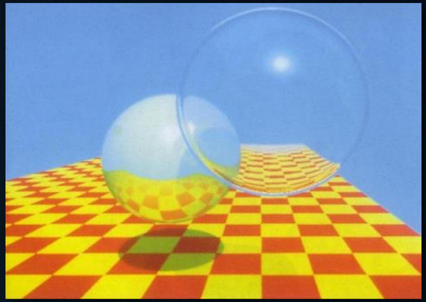


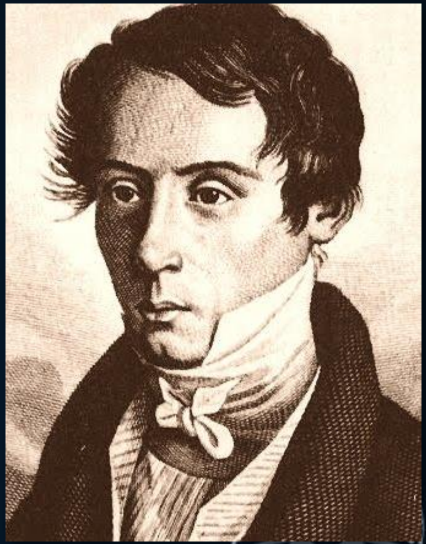
RECAP

Lecture 3 – part 2: Ray Tracing Intro

Concepts:
The "God Algorithm": light transport in nature, light transport in a ray tracer, ray tracing versus rasterization, convex / concave, reflection and shadows in a rasterizer, global data, ray optics, refraction, reflection, Fresnel, Snell, Whitted-style (recursive) ray tracing, ray equation, ray setup, normalization, ray/plane intersection, ray/sphere intersection, primary rays, shadow rays, shadow acne, distance attenuation, absorption, N dot L.

Questions?



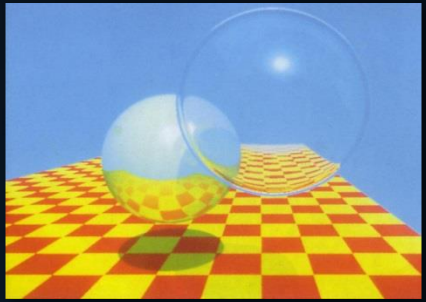


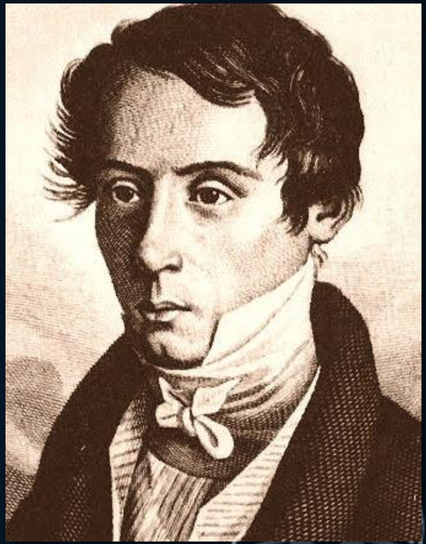
RECAP

Lecture 3 – part 2: Ray Tracing Intro

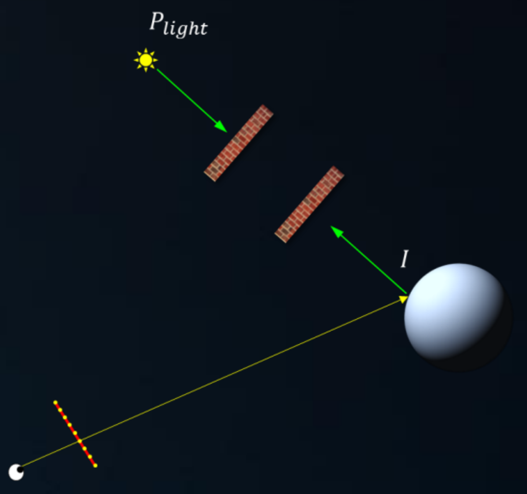
Make sure you can:

- Explain why the efficient ray/sphere intersection code on slide 30 will not work for glass spheres;
- Setup a proper ray given a view direction, FOV and up vector;
- Explain why you need an up vector.



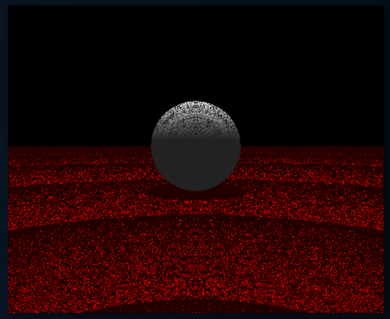


RECAP

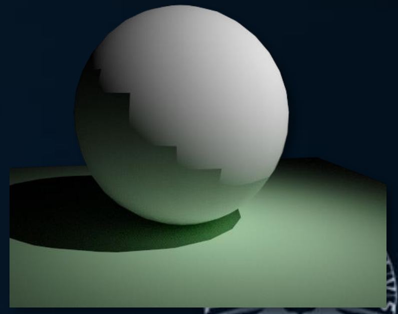


Lecture 5 – Ray Tracing (2)

Concepts:
Calculating normals, vertex normal, normal interpolation, normal for a plane and a sphere, partially reflective surfaces, HDR sky dome, ray tree, diffuse material, Lambert, glossy, Phong, dielectrics, limitations of Whitted-style ray tracing.



Questions?



RECAP

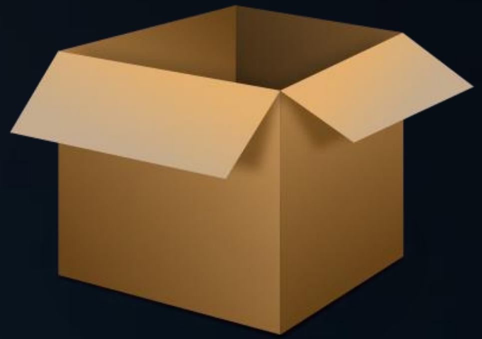
Lecture 5 – Ray Tracing (2)

Make sure you can:

- Construct a vector reflected in a plane;
- Explain why a bathroom mirror is (close to) white;
- Explain why we need a cap on recursion;
- Explain why rays transport little energy in a deep ray tree;

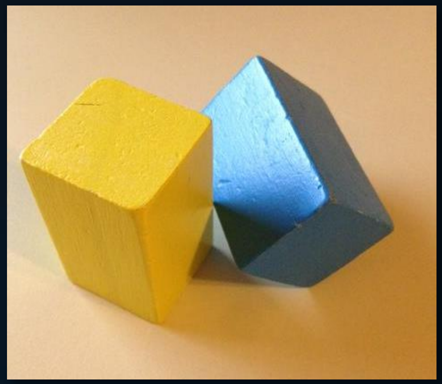
Questions?

RECAP



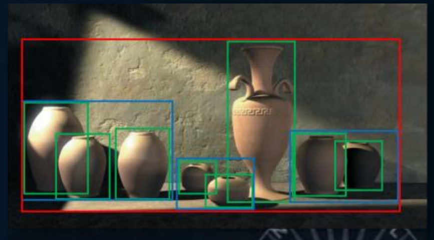
Lecture 6 – Accelerate

Concepts:
AABB, culling, bounding volume hierarchy, conservative tests, false negatives, early out, precalculate, loop hoisting, incremental rendering, rasterization, z-buffer, global data, slab test, ray tracing versus rasterization, spaces, scene graph, engine design.



Make sure you can:

- Construct an AABB for a triangle, sphere, mesh, … ;
- Intersect a ray and a triangle;
- Intersect a ray and an AABB using the slab test;
- Cull a sphere and an AABB against a frustum.



Questions?

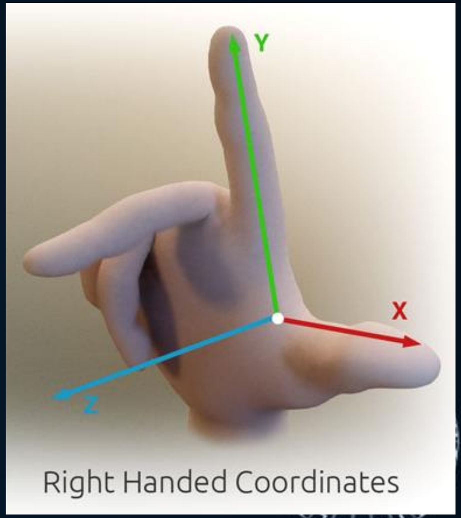
RECAP

Lecture 8: OpenGL

Concepts:
OpenGL, ARGB, Khronos Group, Fahrenheit, Glide, 3dfx, VooDoo, HW T&L, OpenGL coordinate system, right handed, immediate mode, retained mode, state machine, GPU, streaming processor, caches, GPU model, state changes, vertex buffer objects, pixel shader, vertex shader.

Microsoft® DirectX® 11

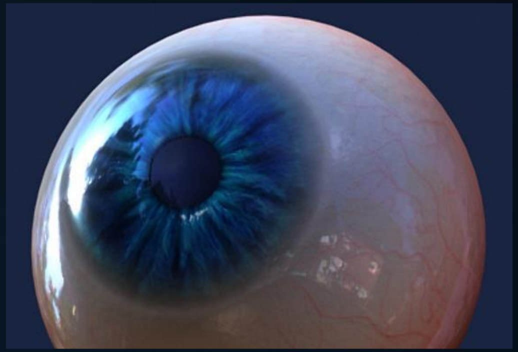
Questions?



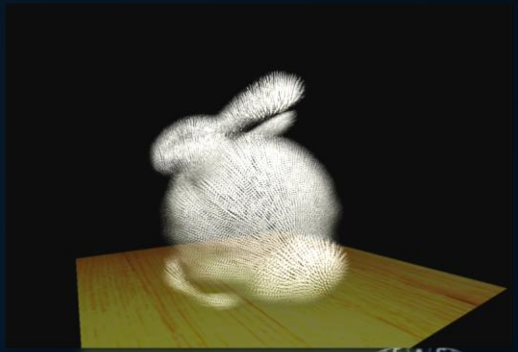
RECAP

Lecture 10: Shading Models

Concepts:
World space, camera space, model space, uniform variables, glossy, Phong, Phong exponent, ambient, planar reflections, environment maps, normal maps, tangent space, fur shells.



Questions?



RECAP

Lecture 11: Visibility

Concepts:
Painter’s, overdraw, BSP traversal (back-to-front, front-to-back), z-buffer, values in the z-buffer, z-fighting, Sutherland-Hodgeman clipping, n-gons, guard bands, back-face culling, frustum culling, hierarchical bounding volume culling, culling using a grid, portals: visibility, mirrors, ‘portals’.

Questions?

RECAP

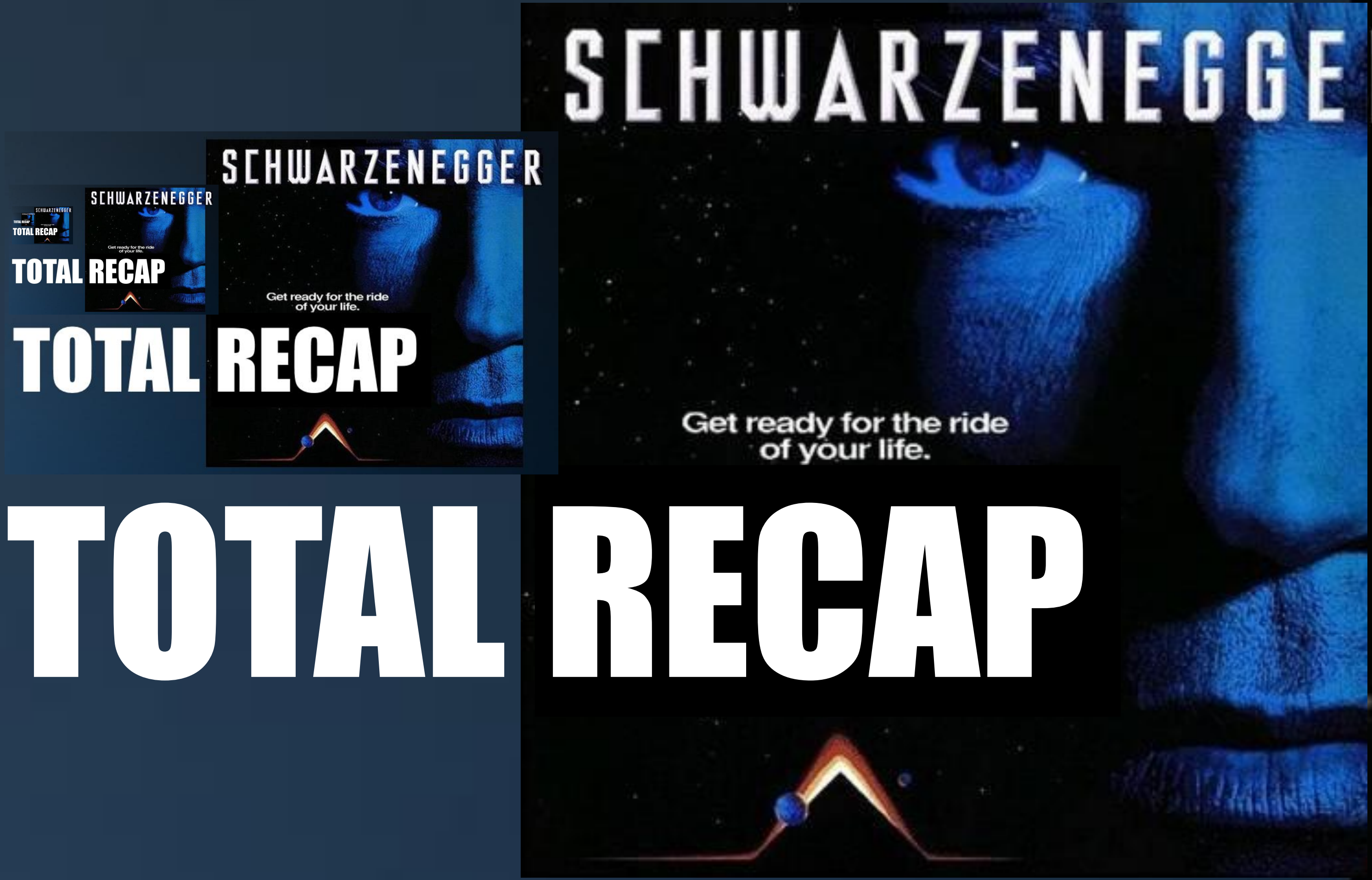
Lecture 12: Post Processing

Concepts:
Post processing, camera / sensor behavior, lens flares, vignetting, chromatic aberration, noise / grain, HDR bloom and glare, tone mapping / exposure control, color correction / grading, gamma, gamma correction, depth of field, circle of confusion, ambient occlusion, screen space AO, bilateral filtering, screen space reflections, limitations of screen space approaches.

Questions?




RECAP


SCHWARZENEGGER
Get ready for the ride of your life.
TOTAL RECAP

What's Next?

Upcoming Attractions:

- Final Exam: Thursday June 29, 13:30
- P3 deadline: Tuesday June 27, 23:59
- Retake Exam: Thursday July 13, 13:30

Master:

- Optimization & Vectorization
- Advanced Graphics

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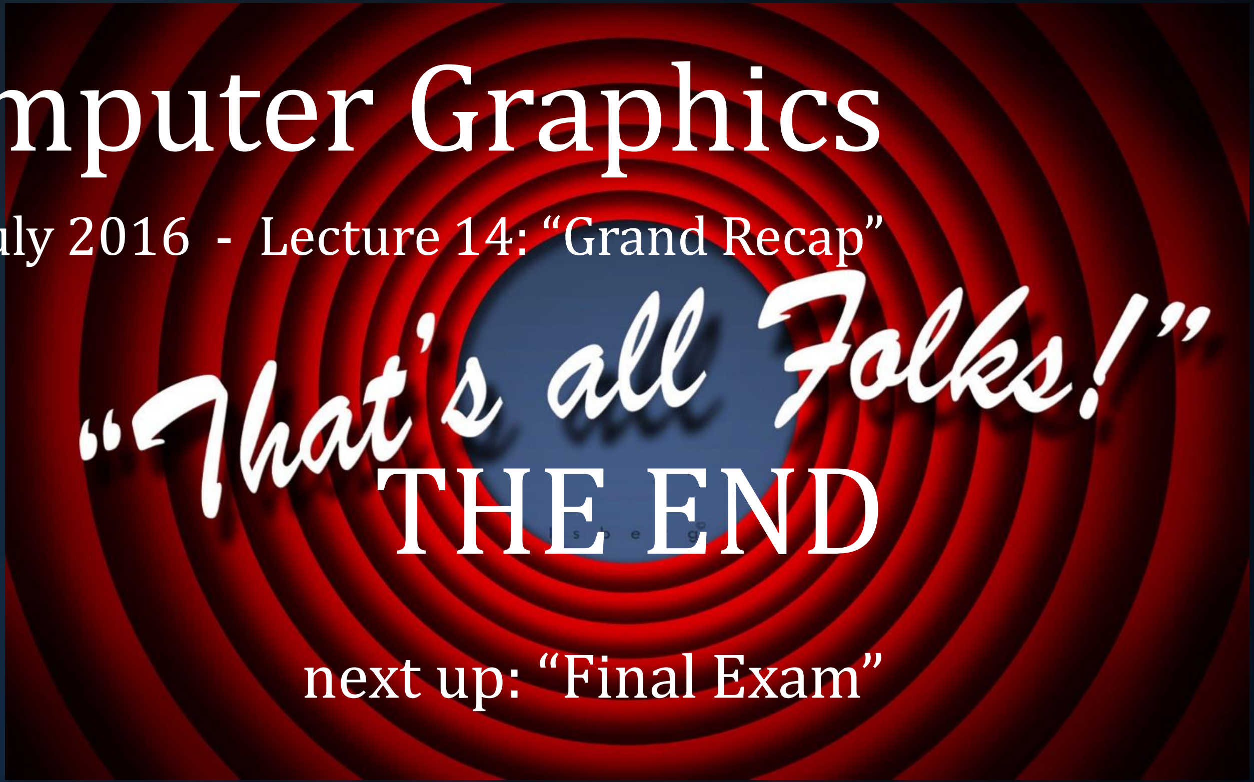
Jacco Bikker - April-July 2016 - Lecture 14: “Grand Recap”



THE END

next up: “Final Exam”

CARACAL

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