CSC 305
Intro.
by Brian Wyvill

The University of Victoria Graphics Group
The Great Train Rubbery (1986/88)
Internet Ray Tracing Contest 2006

September-October 2006
First Place Winner
Ghost Light by Bill Pragnell
Frozen Fire by Robert W. McGregor
Frozen Fire Statistics:

**RENDER TIME:** 37 hours @ 1280x1024 px

**HARDWARE USED:**
Dell PC, Pentium 4 (w/HT), 3 Ghz, 1 GB RAM
Essential Information

Assignment One 5% QT & Transforms
Assignment Two 10% Generalised Cylinders
Assignment Three 15% Ray Tracer

Mid-Term 25% 1 Nov in class
Final Exam 45% time/date set by Registrar
Overview

• Graphics Hardware and Fundamentals
• Geometric Transformations + Maths
• Graphics Data Structures and Algorithms

The course leads to
• Modelling
• Rendering
• Animation
Hardware and Fundamentals

Pixels
Colour Tables
OpenGL support
Graphics Primitives (Scan Conversion)
GPU (TBA later in the term with expert Dr. Paul Lalonde)
Geometric Transformations

Homogeneous Coordinate Systems

Transformations

Properties

2D/3D Viewing Algorithms and Maths

DAGS and DACS

Start with a unit square at the origin. Rotate about the origin to 3,2.

Scale about the origin by 2,1 translate to 3,2.

Translate to 3,2 rotate about the origin.

Translate to 2,1 scale about the origin by 2,1.

DAGS and DACS:

Fred
Bill
Jim

Primitive picture
Modelling

Parametric Curves and Surfaces
Generalised Cylinders
Subdivision Modelling
Implicit Modelling

University of Victoria Graphics Lab.

CSC 305 2007

page 11
Rendering

Lighting
Z-Buffer
BSP Trees
Ray Tracing
Antialiasing (A-Buffer)
Texturing
Global Illumination
Animation probably no time for much your incentive to do the animation course!
Other

Course Web Page: www.csc.uvic.ca/~305

OpenGl C++

Qt: www.trolltech.com

To pass this course you need to know:

1. How to program (preferably in C++)
2. Linear algebra (some)
3. Calculus (not so much)

Apart from graphics algorithms etc.
You will learn:

1. To be a better programmer. (more API’s etc.)
2. More very useful maths.
What do you know?

What programming languages, environments and API’s do you know:

1. C++
2. C#
3. .net
4. Linux/Unix
5. Open GL
6. Qt
7. Other