Introduction

Teaching Staff

- **Lecturer:** Alon Efrat
  - Mon 12:30-14:30
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- **Teaching Assistant:** Leonard D Brown
  - Thu 9:30-10:30 (Taub 7)
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Grading Policy

- See course webpage

Computer Graphics

Synthesis of static/dynamic 2D images from 3D geometry using computers.

3D Graphics

- Geometric model

3D Graphics

- Rendering
Generating 3D Geometry

Explicit: 

\[ z = \sqrt{x^2 + y^2} \]

Implicit:

\[ x^2 + y^2 + z^2 = 1 \]

Digitization

Rendering

- Material Properties
  - Fog
  - Texture
  - Reflectivity
  - Refraction

Image Processing and Computer Vision

- Image enhancement
- Feature extraction
- Pattern recognition
- 3D model extraction

3D model from CT images

Digitization

- Fog
- Texture
- Reflectivity
- Refraction

Image enhancement

- Feature extraction
- Pattern recognition
- 3D model extraction
Applications

- Geometric Modeling
- Mechanical Design

Applications

- Medical

Applications

- Special Effects

Applications

- Computer Games

Applications

- Images
  - Design
  - Advertising
  - Art

Applications

- Movies
Applications

• Online experience

CNN

Nokia

Syllabus

• Introduction
  • OpenGL
  • Geometry & Transformations
  • Scan Conversion
  • Clipping
  • Polygon Fill
  • Hidden Surface Removal
  • Geometric Data Structures
  • Geometric Modeling

• Shading
  • Color Theory (briefly)
  • Shadows
  • Texture Mapping
  • Ray Tracing
  • Antialiasing
  • VRML
  • Cool Stuff. GPU

Introduction

Literature


• Advanced Animation and Rendering Techniques

• OpenGL Programming Guide

Hidden Surface Removal

Shadows

Texture Mapping