Computer Graphics

Course SS 2006
Prof. Dr. R. Westermann

computer graphics & visualization
# Teaching

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<th>Winter term</th>
<th>Summer term</th>
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<td><strong>Visualization (3)</strong>&lt;br&gt;Image Synthesis (3)</td>
<td><strong>Computer Graphics (4+2)</strong>&lt;br&gt;Simulation &amp; Animation (3)&lt;br&gt;Geometry Processing (3)</td>
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Seminar: Graphics Algorithms – various topics

Practicals: Rendering Practical (Summer term)<br>High-Level Graphics Programming (Winter term)
General info

- **Contact**
  - [http://wwwcg.in.tum.de](http://wwwcg.in.tum.de)
  - westermann@in.tum.de
  - Boltzmannstraße 3, finger 13, 2nd floor

- **Check the library for literature**

- **Course slides will be available on the net**
  - Login: cg    Password: shading

- **Diploma theses and project work**
  - Many topics are available
  - Check the web
  - Come by and talk to our staff directly
Teaching

- Schedule
  - Monday: 14:00 – 15:30 room MI 00.13.009A
  - Wednesday: 12:30 – 14:00 room MI 00.13.009A

Exercise on demand
- Monday: 12:30 – 14:00 room MI 00.13.009A

- Announcements, slides, notes
  - http://wwwcg.in.tum.de/Teaching/SS2006/CG
Literature

- Watt, Watt: *Computer Graphics*, Addison-Wesley
- Glassner: *Principles of digital image synthesis*, Morgan Kaufman
- Encarnaçao, Klein, Strasser: *Graphische Datenverarbeitung*, 4. Auflage, Oldenburg Verlag
- Griebel, Bungartz, Zenger: *Computer Graphik*
Definition: Computer graphics

- Data Structures
- Models
- Visualization
- Image Synthesis
- Image Analysis
- Computer Vision
- Segmentation
- Images
- Videos
- 3D-Images
- Image Processing
- Data processing
Computer graphics areas

**Modelling**
The effective representation and efficient modification of geometric shape on a computer

**Animation and simulation**
The generation and representation of dynamic imagery on a computer

**Image Synthesis**
The display of models and scenes on a computer

**Imaging and computer vision**
The manipulation of images and the extraction of object specific information from images

**Visualization**
Methods to visually represent the information content within large-scale multi-dimensional and/or multi-modality data sets
Computer graphics

Graphics-Pipeline

Pixel RGBA → Points Lines Polygons Normals Colors → Curves Surfaces Volumes Material Illumination

Rendering

Modelling
  static

Animation
  dynamic

Visualization
  semantic

Course SS 06 – Computer Graphics
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Graphics pipeline

Darstellung polygonaler Modelle
beleuchtet, schattiert, texturiert
Graphics pipeline

User / Driver

Vertex Stream

Transform & Lighting

Vertex Stage

Rasterisierer

Fragment Stream

Texturing

Pixel Stage

Blending/Ops

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Introduction

- Rendering
Introduction

- Real-time effects
Introduction

- Modelling
Introduction

- Physics-based simulation

Rigid Fluid: Animating the Interplay Between Rigid Bodies and Fluid

Mark Carlson
Peter J. Mucha
Greg Turk

Georgia Institute of Technology

Sound FX by Andrew Lackey, M.P.S.E.
Introduction

- Images

True color
24 bpp

12 bpp
Introduction

- Images

True color
24 bpp

2 bpp
Introduction

- Visualization