Proseminar
Ausgewählte Themen der Computergraphik

Matthias Teschner
Contact

– Matthias Teschner

052 / 01-024
teschner@informatik.uni-freiburg.de

https://cg.informatik.uni-freiburg.de/
Registration

- Send me an email until next Tuesday
  - Name
  - Matriculation number
  - Topic 1
  - Topic 2
  - Topic 3
Presentations

- Three meetings with three presentations per meeting towards the end of the semester
- Take place at the same time and in the same room as the introduction
  - Announced in the course catalog and on our web page https://cg.informatik.uni-freiburg.de/teaching.htm
- Attendance is mandatory
- No other regular meetings
Outline

– Introduction
– Organization
– Presentation
– Summary
Context

Modeling

Computer Graphics

Animation Simulation

Rendering

CGI Making of Share a Coke VFX Breakdown by ARMA.
Modeling – Animation - Rendering

CGI Making of
Share a Coke VFX Breakdown by ARMA.
Course Information

- Key course
  - Pattern recognition and computer graphics
    (modeling, rendering, animation)

- Specialization courses
  - Advanced computer graphics (global illumination)
  - Simulation in computer graphics (deformables, rigids, fluids)

- Bachelor project, Bachelor thesis,
  Master project, lab course, Master thesis
  - Simulation track, rendering track
## Seminars / Projects / Theses in Graphics

<table>
<thead>
<tr>
<th>Semester</th>
<th>Simulation Track</th>
<th>Rendering Track</th>
</tr>
</thead>
<tbody>
<tr>
<td>Winter</td>
<td>Key Course</td>
<td>Key Course</td>
</tr>
<tr>
<td></td>
<td>Simulation Course</td>
<td></td>
</tr>
<tr>
<td>Summer</td>
<td></td>
<td>Rendering Course</td>
</tr>
<tr>
<td></td>
<td>Lab Course - Simple fluid solver</td>
<td>Lab Course - Simple Ray Tracer</td>
</tr>
<tr>
<td></td>
<td>Simulation Seminar</td>
<td></td>
</tr>
<tr>
<td>Winter</td>
<td>Master Project - PPE fluid solver</td>
<td>Master Project - Monte Carlo Ray Tracer</td>
</tr>
<tr>
<td></td>
<td>Rendering Seminar</td>
<td>Rendering Seminar</td>
</tr>
<tr>
<td>Summer</td>
<td>Master Thesis - Research-oriented topic</td>
<td>Master Thesis - Research-oriented topic</td>
</tr>
</tbody>
</table>
Valley

up to 38M fluid particles interacting with more than 650 rigid bricks, highly viscous mud and an elastic tree
Simulation and Rendering

– Automotive Industry (with FIFTY2 Technology)

PreonLab: Drive Through
Outline

– Introduction
– Organization
– Presentation
– Summary
Organization

- Oral presentation of a topic
  - Presentations are given at the same time and in the same room as the introduction (announced in the course catalog and on our web page stated below)
- Written report (approx. 10 pages)
- Attendance of all presentations is mandatory
- Recent information on https://cg.informatik.uni-freiburg.de/teaching.htm
Mandatory Submissions

- Presentation slides and written report in two separate PDF files
  - YourLastName_report.pdf
  - YourLastName_presentation.pdf
- Per email to Prof. Teschner
- Until the last day of lectures of the semester
Consultations

- Two voluntary consultations
- Requested per email
- First consultation
  - General discussion of the outline
  - Content questions
- Second consultation
  - Discussion of the fully prepared presentation
  - Not later than one week prior the presentation
Outline

– Introduction
– Organization
– Presentation
– Summary
Presentation

– 20 min – 25 min per presentation
– 5 min – 10 min discussion
  – Technical questions
  – Form of the presentation
Preparation

- Know your topic
  - Examine relevant material thoroughly
  - Do not try to circumvent problems
- Prepare slides
  - Allow 1 to 2 minutes per slide
  - Slides should be uniform and not too dense
  - Incorporate illustrations, slide titles should be helpful
- Rehearse your presentation
  - Gather feedback, adapt your presentation accordingly
Presentation

- Introduction
  - Introduce yourself and the title of your presentation
- Overview
  - Give an idea, but not too detailed
- Motivation
  - Illustrate the principle and / or applications
  - Explain the goal of your presentation
  - The audience should be eager to listen your presentation
Presentation

– Main part
  – Should consist of distinguished parts
  – Separate different parts of the presentation explicitly
  – Each part should be introduced and summarized

– Summary
  – Tell the audience what you have told them
  – Ask for questions
Presentation

– Check the presentation environment prior to the presentation
– Do not occlude the projection
– Avoid idiosyncrasies
– Stay in time
Presentation

– Do not learn your talk by heart
– Do not read your talk
– Do not read slides, but explain every item on your slide
– Do not be shy or quiet
– Communicate self-confidence
Homogeneous coordinates

Die homogene Notation ist eine in der Graphik häufig verwendete Repräsentation von Positionen und Richtungen, die eine einheitliche Realisierung vielfältiger Transformationen von Positionen und Richtungen durch ein einfaches Matrix-Vektor-Produkt ermöglicht.

Quellen:

– https://cg.informatik.uni-freiburg.de/course_notes/graphics_03_homogeneousNotation.pdf
Seminar Topics

- Rendering
  Rendering pipeline, Bresenham algorithm, Ray tracing, Phong illumination model, Williams shadow mapping

- Modeling
  Marching Cubes, Mesh simplification

- Animation
  Particle systems

- Tools
  Homogeneous coordinates
Outline

– Introduction
– Organization
– Presentation
– Summary
Registration

- Send me an email until next Tuesday
  - Name
  - Matriculation number
  - Topic 1
  - Topic 2
  - Topic 3
Consultations

- Two voluntary consultations
- Requested per email
- First consultation
  - General discussion of the outline
  - Content questions
- Second consultation
  - Discussion of the fully prepared presentation
  - Not later than one week prior the presentation
Presentation

– Oral (20 min – 25 min)
– Start preparation in time
– Employ various sources
– Rehearse your talk
Presentations

– Three meetings with three presentations per meeting towards the end of the semester
– Take place at the same time and in the same room as the introduction
  – Announced in the course catalog and on our web page https://cg.informatik.uni-freiburg.de/teaching.htm
– Attendance is mandatory
– No other regular meetings
Submissions

- Presentation slides and written report of approx. 10 pages in two separate PDF files
  - YourLastName_report.pdf
  - YourLastName_presentation.pdf
- Per email to Prof. Teschner
- Until the last day of lectures of the semester