Image Processing and Computer Graphics

Computer Graphics

Matthias Teschner

Computer Science Department
University of Freiburg
Outline

- organization
- research of the graphics group
- rendering pipeline
Organization

- class
  - 082 006: Monday 10-12, Tuesday 10-12
  - Prof. Matthias Teschner

- exercises
  - 082 021, 028, 029: Tuesday 10-12
  - Mostafa Morsy

- check web page for the exact schedule
  - http://cg.informatik.uni-freiburg.de/teaching.htm

- two parts
  - image processing
  - computer graphics (starts on Dec 5)
## Contact

- **Prof. Matthias Teschner**
  - teschner@informatik.uni-freiburg.de
  - 052 / 01-005

- **Mostafa Morsy**
  - eng.m.m.a.morsy@gmail.com
Exercises / Exam

- exercises
  - Jan 10, Jan 17, Jan 24
  - practical exercises
  - check web page for information
  - processing is optional, but recommended
  - use of the provided source code is optional

- exam
  - written exam
  - test exam
Course Goals

- introduction to the fundamentals of rasterization-based image generation
- functionality of the graphics rendering pipeline
- advanced rendering effects
- introduction to the OpenGL graphics API
- requirements
  - C / C++
  - basics in linear algebra
Slide Sets

- slide sets, exercises and solutions on http://cg.informatik.uni-freiburg.de/teaching.htm
Material

- T. Akenine-Möller, E. Haines: Real-time Rendering
  A. K. Peters Ltd.,
  http://www.realtimerendering.com
Further Readings

- D. F. Rogers: *Procedural Elements of Computer Graphics*  
  McGraw-Hill, 1997
- A. Watt: *3D Computer Graphics*  
  Addison-Wesley, 1999
- J. Foley, A. van Dam, S. Feiner, J. Hughes: *Computer Graphics – Principles and Practice*  
  Addison-Wesley, 1990
- J. Encarnaccao, W. Strasser, R. Klein: *Graphische Datenverarbeitung*  
  Oldenburg Verlag, 1996
Syllabus

- Dec 5 - Rendering Pipeline
- Dec 6 - OpenGL
- Dec 12 - Transformations
- Dec 13 - Projections
- Dec 19, 20 - Lighting
- Jan 9 - Rasterization
- Jan 10 - Exercise
- Jan 16 - Shadows
- Jan 17 - Exercise
- Jan 23 - Texturing
- Jan 24 - Exercise
- Jan 30 - Transparency, Reflection
- Feb 7 - Evaluation, Q & A
Course Information

- key course
  - pattern recognition and computer graphics (rasterization-based rendering)

- specialization courses
  - advanced computer graphics (ray tracing)
  - simulation in computer graphics (e.g., fluids)

- master project, lab course, Master thesis
  - two tracks: simulation, rendering
# Seminars / Projects / Theses in Graphics

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