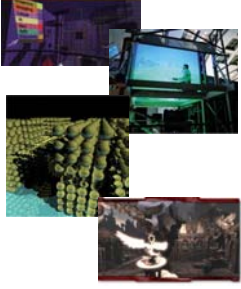


Realtime 3D Computer Graphics Virtual Reality



Marc Erich Latoschik
AI & VR Lab
Artificial Intelligence Group
University of Bielefeld

Organization
Lecture WS 2005/2006

Realtime 3D Computer Graphics Virtual Reality

Lecturer

Dr. Marc Erich Latoschik
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Raum M4-125, Fon 106 2923
consultation hours Mi. 13:00-14:00

Excercises

Lecturer (see left)
to be assigned

What you should already know

- Some fundamental linear algebra, like vector and matrix operations
- Programming in C/C++ (or Java)
- Fundamentals of functional programming, e.g. Scheme, Lisp, Haskell
- Or willingness to learn those things “as you go”
- English ☺

What you will learn in this course

- Fundamental concepts of Computer Graphics
 - How 3D scenes can be defined
 - and how they are rendered on a screen
- Focus on real-time CG: Virtual Reality
- Concepts of and 3D development using
 - OpenGL
 - *Cg*
 - VRML
 - OpenGL Performer

Labor für
Künstliche Intelligenz
& Virtuelle Realität

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Lecture

- Tuesday, 10-12, H3

Excercises

- Block at the end of the semester (1st week after lecture ends)
- Web:
 - Blackboard U Bielefeld: <http://kurse.ub.uni-bielefeld.de:88>
 - Course number 2005_287
 - User Id: “7-digit number of bib identity card”
 - Password: “password for bib account”
 - Password for course enrollment: vr2005
 - **Enrollment open from 14.10.2005-14.12.2005 !!!**

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1. Grade certificate requisite:

- Successful participation of the exercises at the end of semester.
- Verification during this practical course (interview/spoken exam).

2. Written examination at the end of the block:

- Admission criteria is the grade certificate.

Required / Recommended reading (1/2)

- **Interactive Computer Graphics: A Top-Down Approach with OpenGL; Edward Angel (2002)**

or

- **Real-Time Rendering; Tomas Akenine-Möller and Eric Haines (2002)**

- Introduction to Computer Graphics: James Foley , Andries van Dam , Steven Feiner , John Hughes , Richard Phillips (1994)
- OpenGL: A Primer; Edward Angel (2002)
- 3D Computer Graphics; Alan Watt (2000)
- Cg – The Cg Tutorial, Randima Fernando and Mark J. Kilgard (2003)
- Advanced Animation and Rendering Techniques: Theory and Practice; Alan Watt, Mark Watt (1992)
- Computer Graphics and Virtual Environments; Slater, Steed & Chrysanthou (2001)
- Computer Graphics: First Mathematical Steps; Pat Egerton, Teesside University
- Computer Graphics Using Open GL; Francis S. Hill Jr.
- OpenGL Reference Manual: The Official Reference Document to OpenGL, Version 1.2; OpenGL Architecture Review Board (2000)
- OpenGL Programming Guide: The Official Guide to Learning OpenGL, Version 1.2; OpenGL Architecture Review Board , Mason Woo , Jackie Neider , Tom Davis , Dave Shreiner (1999)
- OpenGL Shading Language, Randi J. Rost (2004)
- VRML / X3D tutorials, see <http://www.web3d.org>

Recommended Reading (2/2)

- The Annotated VRML 2.0 Reference; Rikk Carey , Gavin Bell (1997)
- VRML 2.0 Handbook, The: Building Moving Worlds on the Web; Jed Hartman , Josie Wernecke , Silicon Graphics (1996)
- Inventor Mentor, The: Programming Object-Oriented 3D Graphics with Open Inventor, Release 2; Josie Wernecke , Open Inventor Architecture Group (1994)
- Inventor Toolmaker, The: Extending Open Inventor, Release 2; Josie Wernecke , Open Inventor Architecture Group (1994)
- 3D Games: Volume I: Real-Time Rendering and Software Technology; Alan Watt , Fabio Pollicarpo (2001)
- 3D Game Engine Design; David H. Eberly
- C++ Standard Library, The: A Tutorial and Reference -- 1999; Nicolai Josuttis
- The Scheme programming language; Dybvig, R. Kent
- Programming in Scheme; Eisenberg, Michael