Bremen

CG VR

Virtual Reality & Physically-Based Simulation
Organization

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cgvr.cs.uni-bremen.de

Prerequisites

- A little bit of math (just 1. Semester)
- A little bit of programming (Java or Javascript or C/C++)

Where to Find Information for This Course

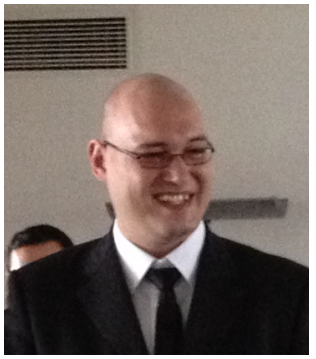
- The course's homepage:
  http://cgvr.cs.uni-bremen.de/
  → "Teaching" → "Virtual Reality"
- Slides (a.k.a. Script) & Assignments
- Hints for text books, online documentation
- Occasionally, announcements
- Please register in StudIP!

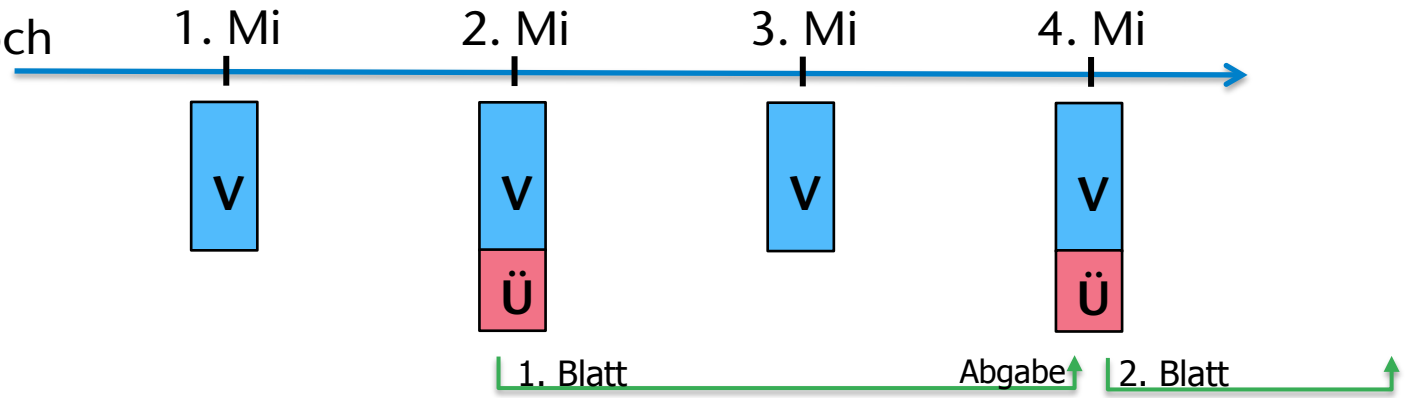
Time of the Class

- Each Wednesday, 2 lectures in one row (8 ct — 12 Uhr) until end of December → 3 SWS
- Your voting:
  1. All 180 minutes in one row (= 3h) (end = 11:15)
  2. 2x 90 minutes with 15 minutes break in-between (end = 11:30)
     a) Start at 8:30, end at 11:45
  3. 3x 60 minutes with 5 minutes break in-between (end = 11:25)
  4. Other variants? ...

Übungen

- Praktische Aufgaben =
  - Entwickeln mit VRML und Java (Javascript, C++, C#)
  - Empfehlung: 2er-Gruppen
- Ort = OAS, Linzer Str. 9a, Raum 3010
- Turnus: alle 2 Wochen eine Doppelstunde
  - Jeweils am Mittwoch Abend
  - Insgesamt also ca. 7 Blätter
  - Abgabe: in der Übung
- Termin: Abstimmung ...
  - Z.B. Mittwoch 12 – 14:ct





The Exam

1. Either: long exam (= ½ hour per student)
2. Or: points from the assignments + short exam
   - Assignments → grade A , short exam → grade B
     - 95% of the points from all assignments → grade A = 1.0
     - 40% of the points from all assignments → grade A = 4.0
   - Overall grade = $0.5 \times A + 0.5 \times B$
   - Precondition: grade A ≥ 4.0 && grade B ≥ 4.0 !
     (Allgemeiner Teil der Bachelorprüfungsordnungen der Universität Bremen, 2010)
3. Or: short exam (10-15 minutes) only
   - Assignments do *not* count towards the final grade!

- Criteria for grading the practical assignments:
  1. Good (= speaking) variable and function names
  2. Sufficient in-line comments
  3. Documentation of the function and its parameters (in/out, pre-/post-condition, what does the function do, ...)
  4. Functionality (solves assignments? no bugs? ...)

Overview

1. Introduction, immersion/presence/fidelity
2. VR frameworks, VRML/X3D
3. Devices
4. System overview
5. Stereo rendering
6. Some techniques for real-time rendering
7. Simple Interaction: gesture recognition, navigation, selection, ...
8. Complex interaction: WIM, action-at-a-distance, ..
9. Collision detection
10. Force feedback
11. Sound rendering
12. Particle Systems
13. Spring-mass systems