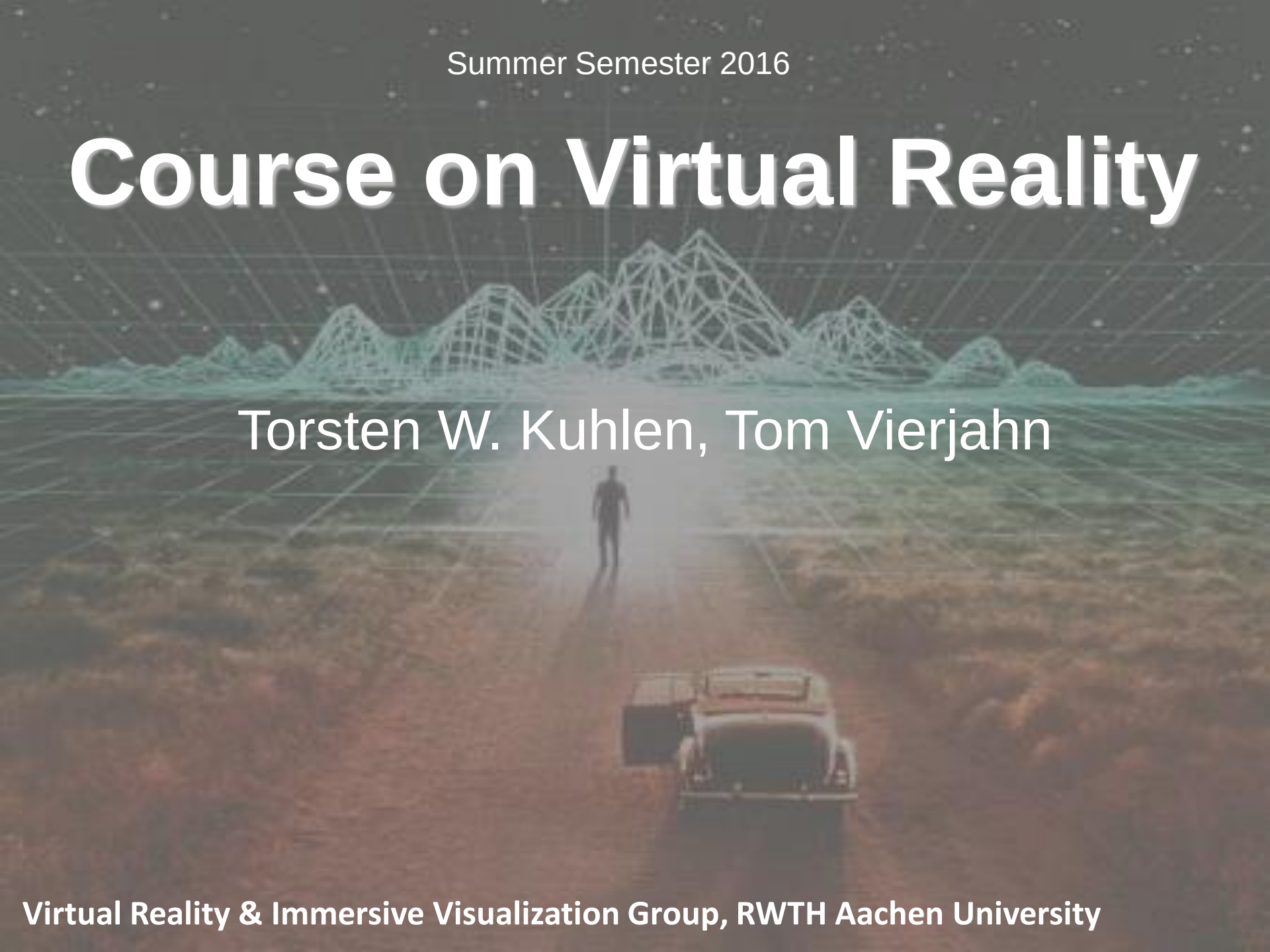
Summer Semester 2016

Course on Virtual Reality

Torsten W. Kuhlen, Tom Vierjahn



Virtual Reality & Immersive Visualization Group, RWTH Aachen University

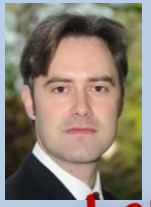
The Visual Computing Institute @ RWTH

- Founded in October 2015 within the Fachgruppe Informatik
  - Creation …
  - Processing …
  - Presentation …

} … of visual (or visualizable) information

Computer Graphics Group
Prof. Leif Kobbelt

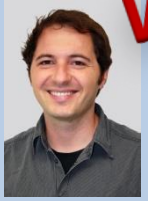
Computer Vision Group
Prof. Bastian Leibe



VR & Immersive Visualization Group
Prof. Torsten Kuhlen

IT Center

Mesh Generation Group
Prof. David Bommes



www.vci-rwth-aachen.de

~ 60 scientists
~ 25 students

Computer Animation Group
Prof. Jan Bender

The Virtual Reality & Immersive Visualization (VR) Group @ RWTH

RWTH

Faculty of Mathematics, Comp. Science and Nat. Sciences

Visual Computing Institute

Lehr- und Forschungsgebiet Virtuelle Realität und Immersive Visualisierung | RWTH AACHEN UNIVERSITY

Research & Teaching

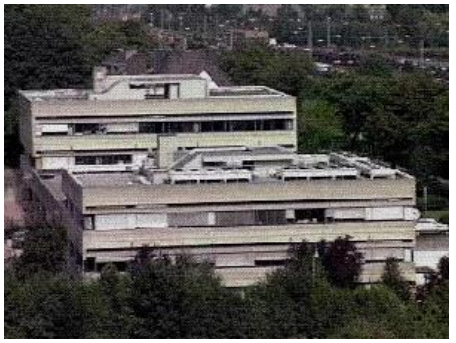
Infrastructure & Services

IT Center

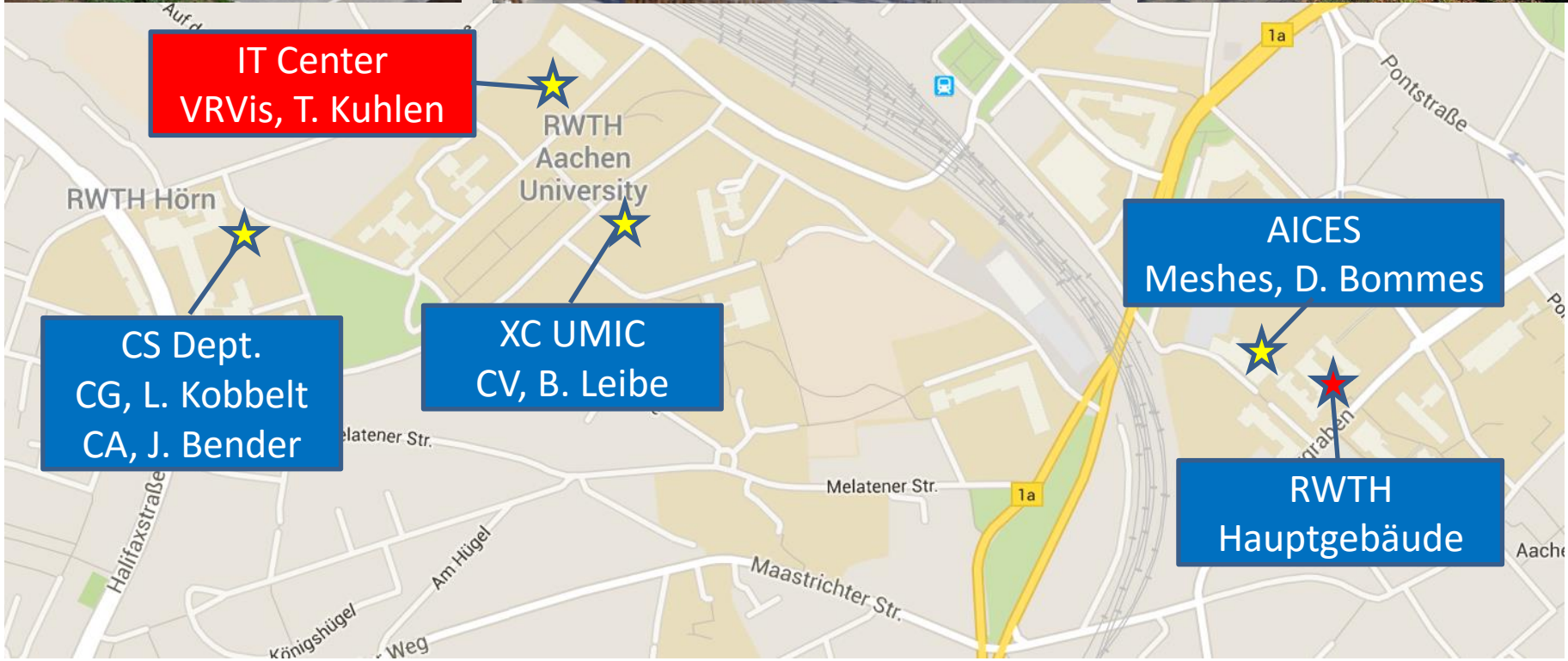
Central Institutions

The RWTH IT Center

- **Central IT Services for the University**
  - Communication Infrastructure
  - WWW, Email
  - Campus, TIM
  - Software, Databases
  - Security
  - …
- **Services & Research**
  - High Performance Comp.
  - Visualization / Virtual Reality



How to Find Us



Organizational Stuff

- Language: German or English (Slides in English)
- Combination Slides / Blackboard
- Material: Slides as PDF on L2P, some movies on YouTube
- Script? Course contents, e.g., in A. Watt, CG, und K.-F- Kraiss, AMMI
- Literature: „Handapparat“ in Computer Science Library
- Miscellaneous, announcements, exercises: L2P
- Taking pictures or movies allowed, publication prohibited!
- Contact
  - office@vr.rwth-aachen.de
  - {kuhlen,vierjahn}@vr.rwth-aachen.de
  - www.vr.rwth-aachen.de

Who Should Attend this Course?

- Informatik
  - Angewandte Informatik (M.Sc.)
- Software Systems Engineering (M.Sc.)
  - Practical / Applied Computer Science
- Media Informatics (M.Sc.)
- Elektrotechnik, Informationstechnik und Technische Informatik (M.Sc.)
  - Modulgruppe C
  - Modulkatalog Wahlfächer
- Simulation Sciences (M.Sc.)
  - Elective Courses
- Technikkommunikation - Grundlagen der Elektrotechnik
  - Wahlbereich aus dem FB6
- Erasmus

Your are attending this course because …

- … you attended CG, CV and/or HCI already, and VR seems closely related

➢ *Yes, you‘re right*

- … you are interested in computer games, and VR seems similar

➢ *At least, both fields have a significant overlap*

- … because the course promises easy credits

➢ *Maybe, but don‘t be too sure!*

- … you have been told the teacher is cool

➢ *Probably not*

… you are curious about the new hype?

- … the teacher speaks an excellent English

➢ *Definitely not!*

What this Course is not …

- This Virtual Reality lecture is not a course on HMDs! HMDs are just one component out of many aspects!

- Virtual Reality games: Only a side effect of this course!

Written exam (Klausur)

- Register on time via Campus!
- „Modulares Anmeldeverfahren“
- **Good luck!**

Exercises

- **Tutor**
  - Dr. Tom Vierjahn

office (1st floor)

- **Contact**
  - Mail
    vierjahn@vr.rwth-aachen.de
  - Office:
    IT Center
    Kopernikusstraße 6, Room K109

entrance

Questions are welcome!

(Consultation hour by agreement!)

Organization of Lessons

- **Lecture**
  - Wed 08:30 – 09:15, AH VI
  - Thu 08:30 - 10:00, AH VI

Oct/Nov: CG lessons on Wednesday

- **Exercise**
  - Mostly on Thu 12:15 - 13:00, AH VI
  - Submission of written solutions on a voluntary basis
    - Groups of 2-3 students are welcome
  - Groups will present solutions in class

This Course and Other Courses

- Until WS 2015/2016: Lecture (V3Ü1) in Winter Semester
- SS 2016: Lecture (V3Ü1) w/o computer graphics
- From WS 2016/2017: VR I in WS, VR II in SS

- Seminar in Winter Semester and in Summer Semester

- VR can be well combined with …
  - … Computer Graphics (Prof. Kobbelt)
  - … Computer Vision (Prof. Leibe)
  - … Computer Animation (Prof. Bender)
  - … HCI (Prof. Borchers)
  - … High Performance Computing (Prof. Müller)

Literature

- **Books (*Handapparat Informatik-Bibliothek):**
- *D. Bowman et al. 3D User Interfaces. Addison-Wesley
- *K. M. Stanney. Handbook of Virtual Environments. Erlbaum
- *M.Slater et al. Computer Graphics & Virtual Environments. Addison-Wesley
- *G. Burdea, P. Coiffet. Virtual Reality Technology. John Wiley & Sons
- *K.-F. Kraiss (Ed.). Advanced Man Machine Interfaces. Springer
- R.S. Kalawski. The Science of Virtual Reality and Virtual Environments. Addison Wesley
- F. Dai. Lebendige virtuelle Welten. Springer Verlag
- J.D. Foley, A. van Dam, S.K. Feiner, J.F. Hughes. Computer Graphics – Principles and Practice. Addison Wesley
- K.D. Tönnies, H.U. Lemke. 3D-Computergrafische Darstellungen. Oldenburg Verlag
- *A. Watt. 3D Computer Graphics. Addison Wesley
- *R. Dörner et al. Virtual und Augmented Reality (In German)

- **Conferences:**
- IEEE Conferences: VR, Vis
- Eurographics Coferences: EG, EGVE, VRIPHYS
- ACM Conferences: SIGGRAPH, VRST