Games Engine Design

Course SS 2015

Rüdiger Westermann
Lehrstuhl für Computer Graphik und Visualisierung

Games engine design – the compulsory lecture

- **Game Engine Design (IN0038)**
  - Monday: 12 – 13.30, HS1
  - Friday: 10 - 11:30, IHS2
- Announcements, slides, notes
  - http://wwwcg.in.tum.de/teaching/teaching/summer-term-15/game-engine-design.html
  - Password: ss2015
- Written exam at the end of the semester
  - Register via tumonline

Games engine design – the compulsory practical

- P**ractical Course: Game Engine Design (IN0039)**
  - Friday: 11 - 11:45, IHS2
  - Tutor groups - register via tumonline
- Announcements, slides, notes
  - http://wwwcg.in.tum.de/teaching/teaching/summer-term-15/game-engine-design.html
  - Password: ss2015
- Written exam at the end of the semester
  - Register via tumonline

Games engine design

- **Lecture and practical for I:GE students only**
  - Compulsory for Bachelor students
  - “Bridge-course” for Master students

Games engine design

- Experiences and recommendations
  - Low attendance rate after few weeks; 50% of the students cannot solve problems which have been solved in the lecture (board exercise) or practical
  - **Recommendation: STAY!**
  - First student feedback in the middle of the semester
  - **Recommendation: COMPLAIN EARLY!**
  - Huge difference between understanding “programming principles” and applying them
  - **Recommendation: PROGRAMM!**

Games engine design – IN0038

- Focus on computer graphics algorithms & implementations
  - Scene modelling and representation
  - Rendering pipeline – from geometric primitives to pixels
  - Texturing, shading and lighting
  - Graphics effects like shadows, reflections, particle effects
- Game engine programming
  - Motion dynamics
  - Collision detection and response
  - Implementation issues

Games engine design – IN0039

- Development of a simple game
  - Write your own little game, including engine components
  - Learn how to program real-time graphics effects
- Focus on graphics programming using C++ & Direct3D
  - Graphics APIs
  - Real-time graphics using graphics hardware
  - Shaders and effects
- In-sink with course
  - First learn the algorithms
  - Create media assets, implement algorithms using API, and use in game

Games engine design – general

- Recommended books

  Games:

  – Gregory, *Game Engine Architecture*
  – Akenine-Möller, Haines, Hoffman, *Real-time Rendering*
  – Eberly, *3D Game Engine Design*

  Graphics

  – Foley, Van Dam, Feiner, Hughes: *Computer Graphics: Principles and Practice*, Addison-Wesley, 3rd edition
  – Watt, Watt: *Computer Graphics*, Addison-Wesley
  – Glassner: *Principles of digital image synthesis*, Morgan Kaufman