Game Engine Architecture

hannes@ru.is

Useful Info

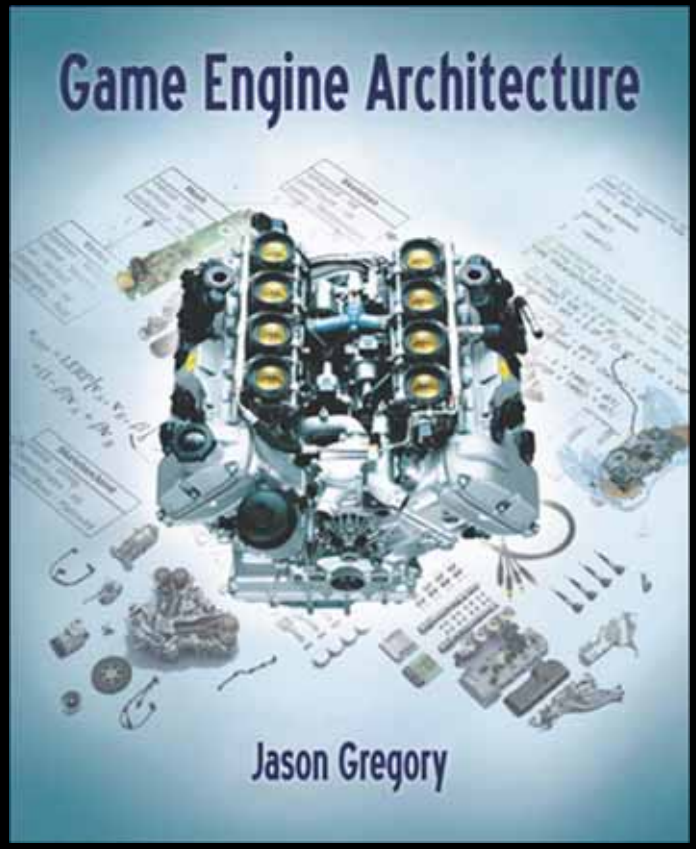
- **Course Web:**

  http://cadia.ru.is/wiki/public:t-gede-12-1:main

- **Instructor:** Hannes Högni Vilhjálmsson
- **Meet:** Office in Venus 2nd floor, call 559-6323 or 618 6323 (open office hours)
- **Email:** hannes@ru.is
- **MSN:** skuggavera@hotmail.com
- **Web:** http://ru.is/~hannes

Textbook

- "Game Engine Architecture" by Jason Gregory, published by AK Peters in 2009.
- Available in the bookstore



- Based on course at USC

Intended Learning Outcomes (1 of 2)

- Explain, compare and evaluate game engines
- Sketch the typical components of a runtime game architecture
- Use C++ development tools and apply best practice in object oriented C++ development
- Design and implement low-level engine systems that deal with:
  - start-up/shut-down, memory management, complex data types, engine configuration, file system, game resources, game loop, rendering loop and interface devices

Intended Learning Outcomes (2 of 2)

- Apply 3D math for solving game world problems
- Explain the core functionality of the rendering and animation system
- Solve basic collision detection and use rigid body physics middleware
- Explain the anatomy of a game world, game objects, data-driven game engines and the general construction of a runtime gameplay foundation system

Week Structure

- Lectures / Discussion:
  - Tuesdays 8:30-10:05 (M121)
- Labs :
  - Thursdays 14:55-15:40 (M106) [not always]
- Practical / Demos:
  - Fridays 10:20-11:55 (M121)

Tentative Schedule

FOUNDATION

- 01 (JAN 09-13) Chapters 1-2: Introduction and Tools
- 02 (JAN 16-20) Chapter 3: Software Engineering

LOW-LEVEL ENGINE

- 03 (JAN 23-27) Chapter 5: Engine Support Systems
- 04 (JAN 30-03) Chapter 6: Resources and the File System
- 05 (FEB 06-10) Chapter 7: The Game Loop and Real-Time Simulation
- 06 (FEB 13-17) Chapter 8: Human Interface Devices

GRAPHICS AND MOTION

- 07 (FEB 20-24) Chapter 4: 3D Math for Games
- 08 (FEB 27-02) Chapter 10: The Rendering Engine
- 09 (MAR 05-09) Chapter 11: Animation Systems
- 10 (MAR 12-16) Chapter 12: Collision and Rigid Body Dynamics

GAMEPLAY

- 11 (MAR 19-23) Chapters 13-14: Gameplay System
- 12 (MAR 26-30) Final Project Presentations and Review

Grading

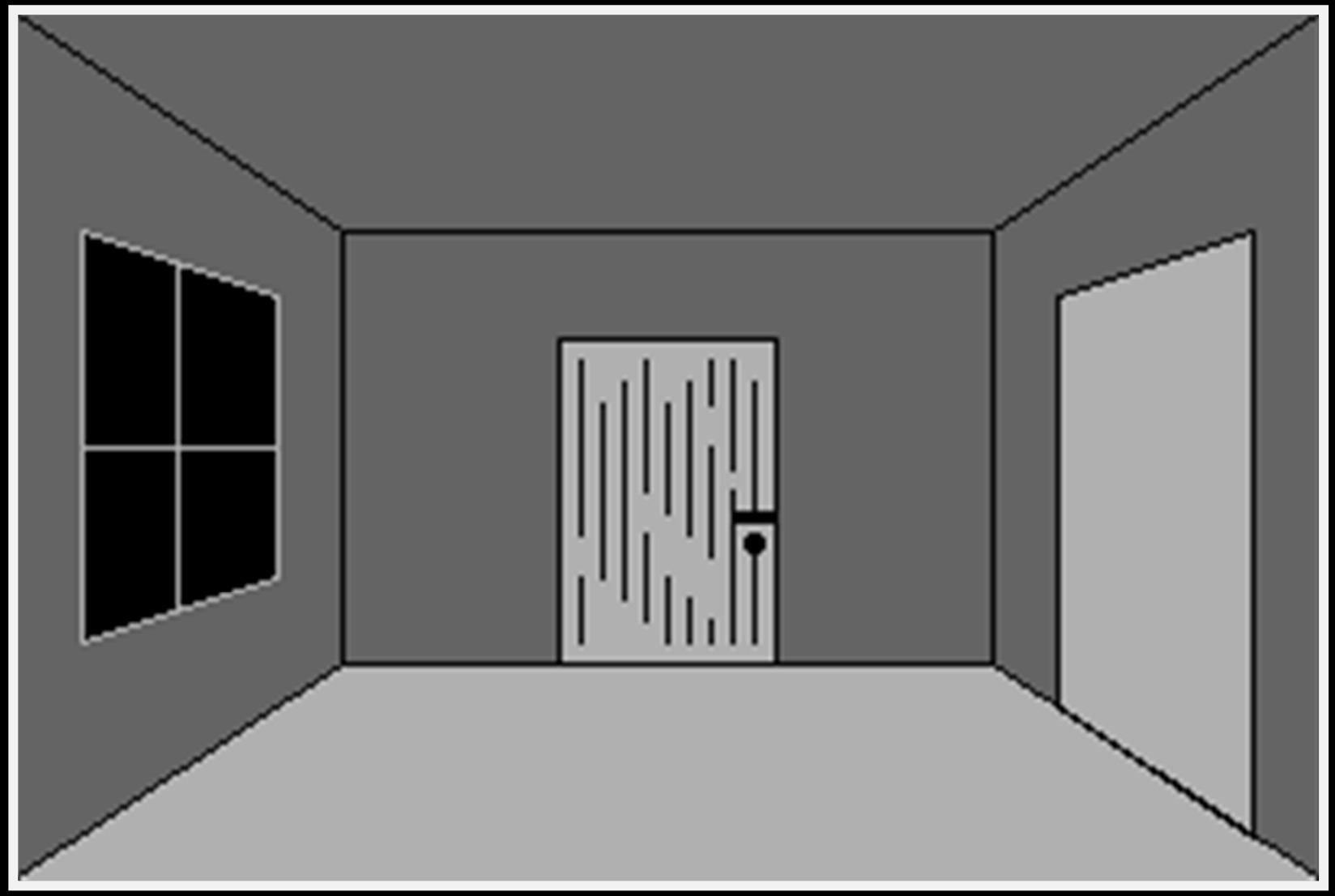
• Participation	10%
• Problem Sets (x4)	20%
• Topical Presentation	10%
• Final Project	30%
• Final Written Exam	30%
Total	100%

- Attendance Requirement: 70%

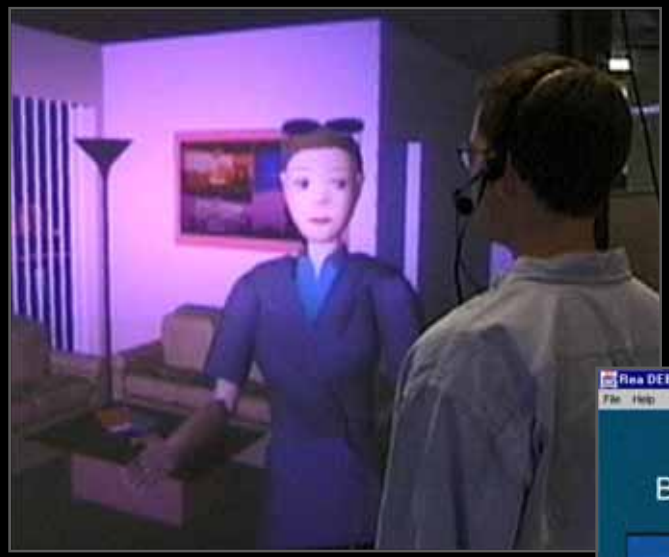
My Relevant Background

hannes@ru.is

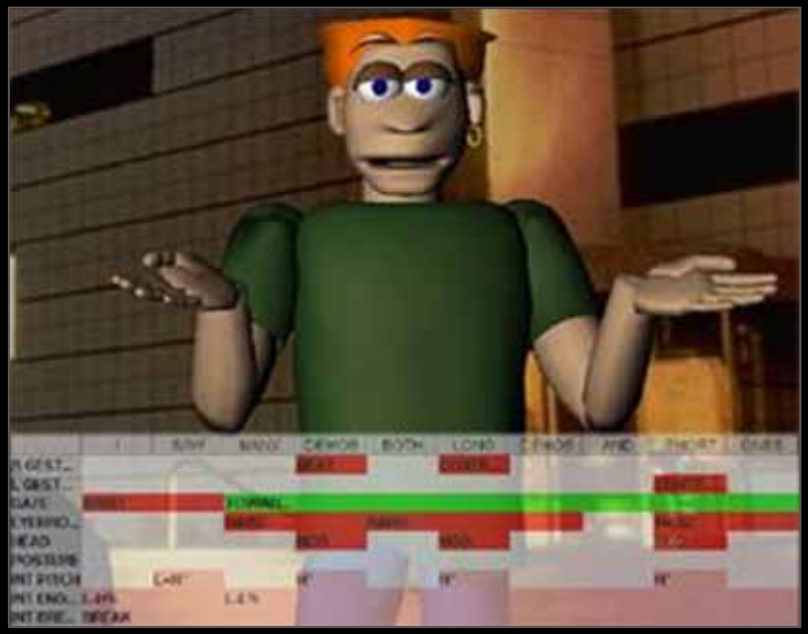
HouseQuest

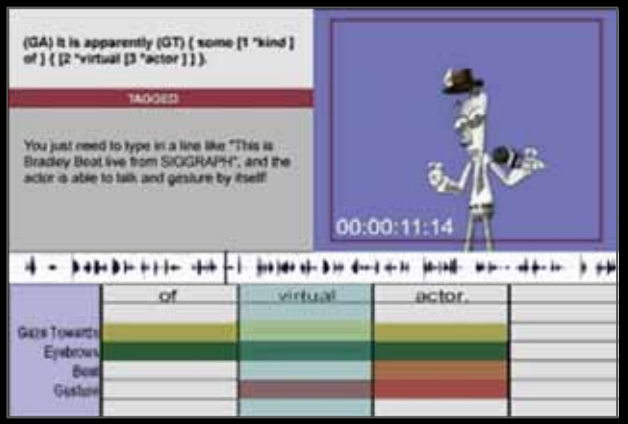


REA The Real Estate Agent



The Animation Toolkit BEAT





BodyChat and Spark

Tactical Iraqi

Tactical Pashto

CADIA Populus (now Impulsion)

CADIA Populus (in EVE)

Game Engines

hannes@ru.is

Doom (1993)

Star Wars Doom

Simpsons Doom

Quake (1996)

Quake Engine

Unreal Engine

American McGee‘s Alice

Deus Ex

Source Engine

Unreal 3 Engine