

DM815

**Computer Game Programming III:
Physics**

Rolf Fagerberg

Fall 2010, 2nd Quarter

Goals for Today's Lecture

Introduction to course:

- Context and contents of course
- Formalities of course
- Textbook
- Introduction to physics simulation
- Particle systems

Computer Game Courses at Imada

Fall 2010, August/1st quarter:

DM809 Computer Game Programming I: Graphics

Not running this time (simply read book yourself, or as individual study activity):

DM810 Computer Game Programming II: AI

Fall 2010, 2nd quarter:

DM815 Computer Game Programming III: Physics

Individual study activity:

DM816 Computer Game Programming IV: Project

Other possibilities: DADIU, bachelorproject.

Subjects covered (all three courses)

- The graphics pipeline
- 3D geometry (transformation, projection)
- Shading (color, textures, lights, shading models)
- Polygonal techniques (culling, level of detail)
- Image based techniques (skyboxes, billboards, . . .)
- Game AI (path finding, chasing and evading, fighting, flocking, . . .)
- Collision detection
- Physics modeling

Not covered in course sequence

- Graphics APIs (self-study)
- Software engineering, testing (known)
- Game engines (a bit in AI course)
- Level editors, scripting (a bit in AI course)
- Modeling
- Animation
- Sound, music
- Gameplay, narrative, study of genres

Course III Teaching Material

Book:

Collision Detection in Interactive 3D Environments

By Gino van den Bergen

Published by Morgan Kaufmann/Elsevier, 2004

ISBN 1-55860-801-X

Notes:

Physically Based Modeling

Noteset by David Baraff and Andrew Witkin

SIGGRAPH Course Notes, 2001

Course Plan

Subject	Lectures
Physics simulation	5
Collision detection	9

Formal Course Description

- Prerequisites:** Programming (DM502+DM503), algorithms and data structures (DM507), and some math (MM501) is a necessity. Knowledge of Linear algebra (MM505), numerical analysis (MM518) and basic 3D programming (DM809) helps.
- Literature:** Textbook and notes
- Evaluation:** Implementation project (pass/fail), oral exam (7-scale)
- Credits:** 5 ECTS
- Course language:** Danish or English

Time and Place

- Tuesdays 08.15-10.00 (Imada seminar room)
- Thursdays 14.15-16.00 (U51)

No examinerier (programming projects take up the time).

Project

Small project (in groups of 2–3) must be passed to attend the oral exam:

Try out one collision detection techniques and moderate physics simulation.

Example programs, or a continuation of previous project from DM809.

Must run without problems on either Imada machines (Linux), or on Windows.