Game Programming

Syllabus – Spring 2005

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Welcome…

Course Description

- Explore the basics behind game programming and the gaming industry

- Pre-requisites
  - Proficiency in C/C++ programming for the Windows platform
  - 개발환경 : Microsoft Visual C++

Course Objectives

- Introduction to the technologies used in the computer game industry
- Learn basics of creating computer games
- Actually build a simple game from the ground up

Grading

- Written closed-book exam : 30%
- Homework, quiz : 20%
- Class Participation : 20%
- Final Project (report and presentation) : 20%

Contact

- Office : 공학관 609호
- Office hour : 매주 화요일 오후1시~5시
- E-mail : jong (at) incheon.ac.kr
- Tel : 032-770-8428

Textbooks and Reading material

- 프로그래밍 관련 (DirectX 포함 프로그래밍) (초급)
  - "DirectX 9를 이용한 3D Game 프로그래밍 입문", Frank D. Luna, 최현호(역), 정보문화사, 2004.
  - Real-Time Rendering Tricks and Techniques in DirectX, Kelly Dempski, Premier Press, 2002. (recommended for Direct3D study)
  - DirectX SDK Documentation (DirectX 9.0c SDK Update December 2004)
- 프로그래밍 관련 (프로그래밍) (초급)
  - "Game Programming Complete", Mike McShaffry, Paraglyph Press Inc., May 2003.
  - Game Programming Tricks of the Trade, Lorenzo Phillips, 김태훈/최광일(역), 영진닷컴&Tomson, 2003.

Textbooks and Reading material

- 기본 개념 (초급)
  - "Core Techniques and Algorithms in Game Programming", Daniel Dalmau, 사이텍미디어, 이재영등(역), 2005.
- 알고리즘 및 이론 (중고급)
  - Selected topics from "Game Programming Gems" (Series)
    - 1: Mark DeLoura (Ed.), Charles River Media, August 2000.
    - 2: Mark DeLoura, Charles River Media, October 2001.
    - 3: Dante Treglia and Mark Deloura, Charles River media, July 2002.
    - 4: Andrew Kirmse, Charles River Media, March 2004.
- 초급 이론 관련 (초급)
  - Linear Algebra and Its Applications (3rd ed.), David C. Lay, Pearson Education, 2003. (선형대수가 매우 부족한 학생에게 추천)
- 고급 이론 관련 (중고급)
  - Real-Time Rendering (2nd ed.), Tomas Akenine-Moller & Eric Haines, AK Peters, July 2002. (very popular but not so easy)
  - 3D Game Engine Design: A Practical Approach to Real-Time Computer Graphics, David H. Eberly, Morgan Kaufmann, 2001.

Course Syllabus (tentative)

- Introduction and course overview
  - Overview of modern game software architecture
- Foundations of game programming
  - Review of software engineering basics
  - Project organization, source control
  - Good coding practices
- Mathematics for games
  - Linear Algebra
  - Matrices and Matrix Operations
  - The matrix as a geometric transformation

Course Syllabus (tentative)

- Windows Programming Basics
  - Window creation and destruction
  - Message handling
- Direct3D Programming Basics
  - Creating a D3D Device
  - Render States
  - Vertex Buffers
- The 3D Graphics Pipeline
  - Typical Pipeline
  - Coordinate Spaces
  - Transforms
  - Culling and clipping
- DirectX
  - Materials, Lighting
  - Dealing with DirectInput, DirectSound, and DirectShow

Course Syllabus (tentative)

- Rendering
  - Orientation in 3D Space, Collision Detection
  - Animation
- Game Physics
  - Rigid Body Motion
  - Newton's Laws of Motion
  - Angular Velocity
  - Inertia
  - Realistic Collision Response – Newton Euler Equations
- Artificial Intelligence
  - Responsibilities of the AI – state machines
  - A* path finding
- Putting it all together
  - Game programming project

Taste!!