
National Centre for Computer Animation

Entertainment Systems

A game is a series of interesting choices.
(Sid Meier)


 Who are we?

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 ES Overview

- Introduction to Entertainment Systems
- 2D Graphics in Entertainment Systems
- Sound, Speech & Music
- 3D Graphics in Entertainment Systems

 ES Reading List

Essential Reading

- Mathematics for Computer Graphics
Vince, J. – Springer-Verlag, 2005
- The Art of Computer Game Design
Crawford, C. – available on-line
- Programming Guide to the Java 2D™ API
online: <http://java.sun.com/javase/6/docs/technotes/guides/2d/spec/2d-bookTOC.html>



ES Reading List

Recommended Reading

- *Mathematical and Computer Programming Techniques for Computer Graphics*
Comninos, P. – Springer-Verlag, 2006
- *OpenGL Programming Guide*
Woo, Neider and Davis – Addison-Wesley
- *Computer Graphics: Principles and Practice*
Foley, van Dam and Hughes – Addison-Wesley, 1996



ES Assessment

Term 1: project (*simple game*) – 10% (TBC)

- 2 weeks (20/11/2006 - 11/12/2006)
- TBA – most likely: program + post-mortem style report

Term 2: project (*joint with OOP & ISAT*) – 40% (TBC)

- Dates: 19/03/2007 – 30/03/2007
- nature of project TBA

Term 3: written exam (2 hours) – 50%



Multimedia Systems

Multimedia:

- the combined use of different media (e.g. *text, audio, video*)
(*ambiguous term, i.e. a book with text and pictures could be considered multimedia*)

(common) Multimedia (*content*)

- amalgamation of film and animation
- (*leading to*) interactive media/games (*combination of all*)



(digital) Multimedia (*technology*)

- DVD-Players
- Mobile phones
- Games Consoles
- Computers
- Etc.



(Computer) Games

Before we look at computer games as the “ultimate” entertainment system we need to discuss:

- what is a game
- game theory
- electronic games



(Computer) Games

Games have been a part of human life since the dawn of humanity

So what is a game?

- a series of interesting choices (*Meier*)
- a closed formal system that represents a subset of reality (*Crawford*)
- a structured or semi-structured, contrived activity (*Wikipedia*)

These are just some of many formal definitions.



(Computer) Games

Game Theory

- not directly related to entertainment
- uses mathematical models to predict game results and find winning strategies
- used for economics and political models
- (*also used for board game AI, i.e. chess*)



Computer Games

Electronic games

- (*analogue games*)
- console games
- handheld/mobile games
- computer games

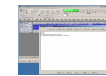
These are a culmination of entertainment system technology, providing a combination of most elements of multimedia technology.



Serious Applications

Simulation & Analysis

- Crime/Accident Scene Reconstruction
- Forensic Data Mapping/Analysis
Example: Audacity Policial (forensic sound analysis)
<http://sourceforge.net/projects/audacitypolicial>
- Archeological Visualisation
- Air Traffic Control simulation



Source: www.londoncontrol.com

Educational („Edutainment“) systems

- Learning Games

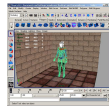




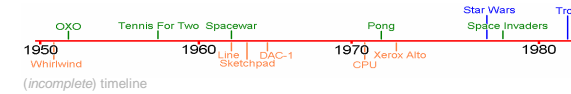
Tool Development

Entertainment System techniques are used for tools:

- Real-Time Data Visualisation
(example: MoCap data visualisation)
- Architectural Visualisation
- Content Creation/Authoring Tools
(*SFX applications, game level editors etc.*)



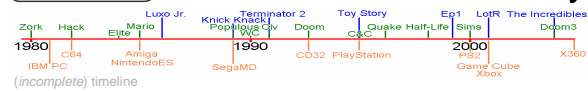
History



- 1885 CRT
- 1927 Raster Display
- 1951 Whirlwind (*radar*)
- 1952 OXO (*EDSAC*)
- 1958 Tennis For Two (*Oscilloscope*)
- 1962 Spacewar (DEC *PDP-1*)
Line Drawing (*Bresenham*)
- 1963 Sketchpad (*Sutherland*)
<http://www.cl.cam.ac.uk/TechReports/UCAM-CL-TR-574.pdf>
- 1964 DAC-1 (*GM & IBM*)
- 1971 Microprocessor (*CPU*)
- 1973 Xerox Alto
- 1982 Tron



History



- 1981 IBM PC
- 1982 Commodore 64
Atari 5200 (*game console*)
- 1985 Commodore Amiga
Nintendo Entertainment System
- 1989 Nintendo Game Boy
Sega MegaDrive (*Genesis*)
- 1993 Amiga CD32
- 1995 Sony PlayStation
- 2000 Sony PlayStation2
- 2001 Nintendo GameCube
Microsoft Xbox
- 2005 Microsoft Xbox360



Future

Future Entertainment Systems (*FES*) are most likely a one-box solution, combining all currently available systems:

$$\text{STB} + \text{DVR} + \text{VGC} + \text{NPC} = \text{FES}$$

- STB: Set Top Box
- DVR: Digital Video Recorder
- VGC: Video Games Console
- NPC: Networked Personal Computer

You will shape this future.