Session: Modern Applications
Topic: Gaming

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Computer Game Development
- Ultimate achievement in computer science
- Combines multiple, complex fields and subjects

Field	Subject	Description
C. Science	Programming	Game logic
	Computer Graphics	Game display User Interface
	Artificial Intelligence	NPC behavior Combat Path-finding
Physics	Physics	Physics Engine Motion Modeling (Rag-Doll physics) Animation Collision Detection
Art	Story Boarding	Game planning
	Graphics	Art design
	Character Design	Character style Art and modeling
	Animation	Character animations Gameplay actions Cutscenes
Literature	Script Writing	Game dialogue
	Plot	Storytelling Plot points, events
	Character Development	Character progress
Language	Script Writing	Game story text
	Localization	Translation to/from other languages

(NPC - Non-Player Character)

Gaming Devices
- Gaming covers not only personal computers
- Includes dedicated Game Consoles, portable game devices
- Also includes convergence devices (cell phones, PDAs, toys)

Category	Game Device	Manufacturer
Game Console	Playstation Playstation 2 X-Box Gamecube	Sony Sony Microsoft Nintendo
Portable	Gameboy PSP	Nintendo Sony
Other	Cell Phones N-Gage	Various Nokia
Next Generation	Playstation 3 X-Box360 Revolution	Sony Microsoft Nintendo

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Consumer Impact

Microsoft X-Box
- "Halo" (X-Box) sold 1 million copies within 5 months, averaging 6 copies per minute per day since launch day Nov. 15, 2001 (2002)
- Halo sold over 4 million copies worldwide (2004)
- "Halo 2" (X-Box) had first day sales of $125 million on Nov. 9, 2004 (2.38 million copies)
  - "Spiderman 2", the top-selling first day movie, had first day sales of $115 million
  - "The Incredibles" was the past weekend movie leader, selling $70.5 million in three days

Online Gaming
- Over 180 million man-hours have been spent playing Halo 2 online on X-Box Live (12/2004)
- 180 million hours = 21,006 years
- Players average 91 min per session (12/2004)
- 324,362,454 games have been played
- The leading game player has played 14,919, averaging 6 hours per day (71 games per day)
- If everyone had worked a $6/hour job instead of playing Matchmade games they would have earned $1.1 billion ($3.2 billion at the average wage in Minnesota)
- If you had a nickel for every game played, you would have over $100 million

Sony Playstation 2

- "Gran Turismo 4" (Sony) sold 6.25 million copies worldwide (1.09m in Japan, 1.94m in America, 3.12m in Europe) (4/2005)
- The Gran Turismo series (GT, GT2, GT3 A-Spec, GT Concept, GT4 Prologue, GT4) has sold 43,670,000 copies worldwide

Industry-Wide

- For the first 6 months of 2005 total game sales topped $4.1 billion ($3.4 previous year) (NPD Group)

Cross-Industry

- Universal Pictures and Twentieth Century Fox announced Oct. 4, 2005 that triple-Academy Award winners Peter Jackson and Fran Walsh will serve as executive producers of the Halo movie
- Peter Jackson directed the Lord of the Rings trilogy, by the way

Game Genres
- Categories of games come from traditional terms
- The borders can be very fuzzy and overlap
- Note that "2D" and "3D" are a separate issue

Basic Genres

Fighting
- Two players fight in side-by-side fashion
- Limited in range of possibly movements
- Mortal Kombat, Street Fighter, Dead or Alive, Soul Calibur

Racing
- Cars race
- Traditionally popular category due to limited physics realm, mechanical object models (as opposed to character models)
- Ridge Racer, Gran Turismo, Project Gotham Racing

Simulation
- Accurately simulate real-world activities (flying, city development)
- Often utilize complex physics, behavior models, and mathematics
- Can also require challenging graphics
- Microsoft Flight Simulator, Sim City, The Sims

Sports
- Common examples include football, baseball, basketball, soccer, tennis, golf
- Limited game options (within rules of sport) but extensive physics modeling and animations

Puzzle

- Usually involve short rounds which require some kind of solution to configuration or matching problem
- Often involve speed challenge between two players
- Can also refer to simple board games
- Tetris, Puyo Puyo Fever, Bust-a-Move

Platform
- Side-scrolling games where a single character is navigated through environments ("platforms") by running and jumping
- Often include "Power-Ups" that can be collected to restore health or increase some statistic (attack power, defense)
- Sometimes involve shooting weapons
- Very traditional game genre, in modern times has seen some merging with other genres
- Super Mario Brothers, Metroid, Ratchet and Clank

Advanced Genres

Role Playing Games (RPG)
- Main character and possibly additional characters in a "party" improve statistics (stats) through game exploration, items and combat

Settings
- Traditionally use some fantasy setting including monsters and magic
- "Role-Playing" stems from adopting the role of the character
- Involve collection of weapons and items, and combat
- Fairly long and involved storylines and plot, dialogue-laden

Stats
- Typical stats include "Strength", "Defense", "Intelligence"
- Use some "Experience Point" (XP) system to track progress in game (combat and exploration)
- Progress in XP eventually leads to increases in character "Level" and improvement in base stats
- Weapons and items can also modify stats (temporarily or permanently)
- Can use fairly complex rules for modification of stats
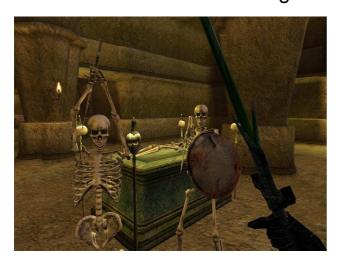- Essentially a database application, where characters (and enemies) have varying numerical statistics which are adjusted during game progress and tracked

- *Turn-Based Combat*
  - Occurs in turns between the player and the enemy
  - Player sets actions for all characters, then actions are executed before enemy takes turns
  - Alternate turns until one side is eliminated
  - Similar to board games

- *Real-Time Combat*
  - Movement during combat is not paused
  - Actions can occur at any time
  - Often actions take varying amounts of time to execute, and may include a recovery or delay time

- Final Fantasy, Suikoden, Might and Magic, Baldur's Gate (Turn-based Combat)
- Elder Scrolls: Morrowind (Real-time combat)

Tactical Role-Playing Games

- Used to describe RPGs that typically conduct movement on some form of grid map
- Distance from enemies and direction / position of character affect actions
- Final Fantasy Tactics, Disgaea

Shooters
- Involve running around and shooting enemies
- Interaction limited to picking up weapons, items, and health (sometimes Power-Ups)
- Typically very fast paced, emphasize twitch-speed
- Often emphasize multi-player gaming, trash talking
- Games can vary in the amount of damage allowed before death

- *First-Person Shooters (FPS)*
  - Player view is as if looking through eyes of main character in game
- *Third-Person Shooters (TPS)*
  - Player view is from just behind the main character (either just above or to the side)
- "First-Person" and "Third-Person" views apply to many game types, not just FPS and TPS
- Some games allow switching of view between first- and third-person

- Unreal Tournament, Quake, Halo, America's Army (FPS)
- Max Payne (TPS)

Other Genres

Action/Adventure
- Heavily abused term
- Traditionally included games where movement occurred from screen to screen and involved exploration and item-collecting more than combat
- Can often describe games that would be FPS/TPS except primary weapon does not shoot (e.g. swords)

Unique
- Katamari Damacy - a rolling ball game
- Harvest Moon - raise crops and progress through life in a small town
- Mr. Mosquito - fly around and bite people without getting swatted

Shared Genres
- Games can often overlap genres, or include aspects from multiple genres
- Example: First-Person RPG (Elder Scrolls: Morrowind)