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## CMSC 498M: Chapter 1 Introduction to Computer Games

### Resources:

- Lecture notes from R. McKenna, SUNY Stony Brook, 2007.
- "A Brief History of Video Games", by R. T. Bakie, in Introduction to Game Development, S. Rabin. ed. 2005, pp. 3-36.
- "What is a Good Game?", by M. Overmars, 2007.  
<http://www.yoyogames.com/make/tutorials>
- "ESA'S 2006 Essential Facts about the Computer and Video Game Industry," <http://www.theesa.com/facts/index.php>

### Overview:

- History and basics of computer games
- Industry facts and figures

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## What is a Game?

- *A game is an activity among two or more independent decision-makers seeking to achieve their objectives in some limiting context. (Clark C. Abt)*
- *A game is a form of art in which participants, called players, make decisions in order to manage resources through game tokens in the pursuit of a goal. (Greg Costikyan)*
- *A game is a system in which players engage in an artificial conflict, defined by rules, that results in a quantifiable outcome. (K. Salen and E. Zimmerman)*
- *A computer game is a software program in which one or more players make decisions through the control of game objects and resources, in pursuit of a goal. (M. Overmars)*
- *A great game is a series of interesting and meaningful choices made by the player in pursuit of a clear and compelling goal. (Sid Meier)*

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## What Things do You Look for in a Game?

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It should be **fun**:

- Responsibility of **game designers**.
- Interesting plot/premise, sense of humor, rewards.
- Scoring vs. solving.

It should be **nice to look at**:

- Responsibility of **game artists**.
- Beautiful, realistic, or interesting graphics.

It should **run correctly and efficiently**:

- Responsibility of **game programmers**.
- Multi-platform, multi-player, multi-threaded.

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## Key Elements in Game Design

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**Goals:**

- Should be clear to the player. Not too easy to achieve.
- Success/failure depends on a combination of skill and luck, with skill being the more important.

**Decisions:**

- Interesting decisions lead to an interesting game.
- Users need to have knowledge of outcomes to make good decisions.

**Balance:**

- Between players.
- Between player and game-play.
- Among game features.

**Rewards:**

- Positive feedback. Sense of accomplishment.

**Flow:**

- Sense of progress: increased abilities, increased challenges.

**Immersion:**

- A sense of "being there." Graphics, stories, characters, music, effects.

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## What Things Infuriate you in a Game?

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### Game-play:

- Weak premise/storyline.
- Too difficult or too easy.
- Overly complicated rules (no 100-page game manual, please).
- Poor pacing (action too fast or too slow).
- Inflexible (players are forced to play a certain way).

### Artistic Issues:

- Bad music/sound effects.
- Poor modeling ("what is that?").
- Disorienting graphics.
- Poorly designed point-of-view ("something is standing in my line of sight").

### Programming Issues:

- Bugs.
- Unintelligent games.
- Reliance on finding out patterns.
- Slowdowns.
- Multiplayer cheaters.

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## Why Study Compute Games?

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- To get a job in the **computer game industry**.
- It is **fun**.
- Games are **complex**.
- They push the envelope of **computing technology**.
- How do I **write my own**?
- **Bottom line**: Making games is a great way to learn.

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## Game Genres

**Action** - Rely more on hand-eye coordination than on strategy.

- Doom, Quake, Unreal, Metal Gear, Halo, even Sonic or Mario Bros.

**Adventure** - Linear storyline in a journey of exploration and puzzle-solving.

- Myst, Shadow of Destiny.

**Fighting games**

- Soul Calibur, Mortal Kombat, etc ...

**Puzzle/Board games**

- Tetris, Monopoly, Risk, Stratego, Scrabble, etc.

**Racing**

- Need for Speed, 18 Wheeler.

**Role-Playing Games (RPGs)** - similar to adventure, but more on character growth.

- Diablo, World of Warcraft, Final Fantasy (what's wrong with you people?)

**Simulations** - Simulate real-life environments.

- Flight Simulator, The Sims, RollerCoaster, SimCity

**Sports**

- EA Sports NHL series, John Madden football series

**Strategy** - Involve tactical organization.

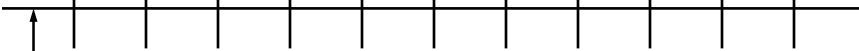
- Civilization (turn based strategy), Warcraft, Starcraft (real-time strategy)

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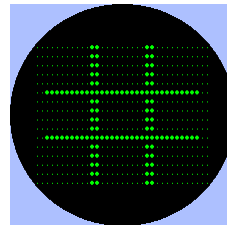
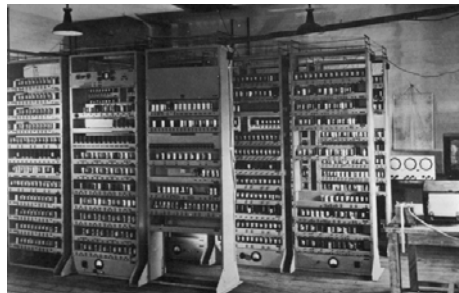
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## History of Computer Games

1955 1960 1965 1970 1975 1980 1985 1990 1995 2000 2005



**1952 - First Computer Game**  
**"Naughts & Crosses" by A.S. Douglas**  
**for EDSAC Computer, Cambridge University, U.K.**



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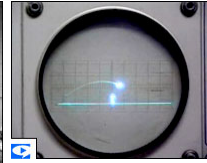
## History of Computer Games

1955 1960 1965 1970 1975 1980 1985 1990 1995 2000 2005

1958 - First Video Game  
"Tennis for Two" by William Higinbotham of  
Brookhaven National Lab.



William Higinbotham

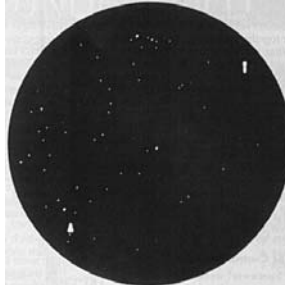


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## History of Computer Games

1955 1960 1965 1970 1975 1980 1985 1990 1995 2000 2005

1962 - First Widely Distributed Computer Game  
"Spacewar" by Steve Russell of MIT  
for a PDP-1 minicomputer.

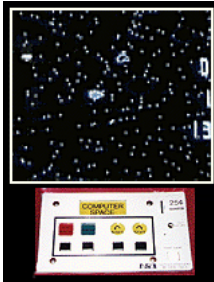


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## History of Computer Games

1955 1960 1965 1970 1975 1980 1985 1990 1995 2000 2005

1971 - First Video Arcade Game Released  
"Computer Space" by Nolan Bushnell of Nutting Associates.



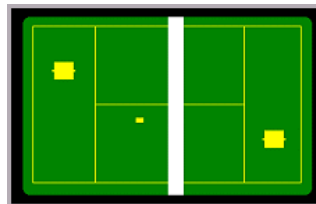
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## History of Computer Games

1955 1960 1965 1970 1975 1980 1985 1990 1995 2000 2005

1972 - First Home Video Game Console Released  
"Odyssey" by Ralph Baer with Magnavox.



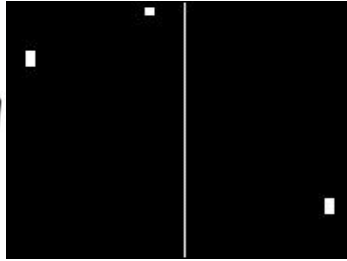
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## History of Computer Games

1955 1960 1965 1970 1975 1980 1985 1990 1995 2000 2005

1972 - "Pong" released by Nolan Bushnell of Atari.



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## History of Computer Games

1955 1960 1965 1970 1975 1980 1985 1990 1995 2000 2005

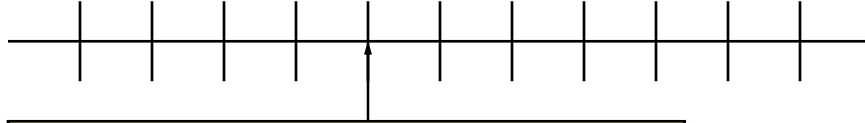
1973 - "Empire" by John Daleske & Silas Warner of Iowa State University. Early networked multiplayer game.



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## History of Computer Games

1955 1960 1965 1970 1975 1980 1985 1990 1995 2000 2005



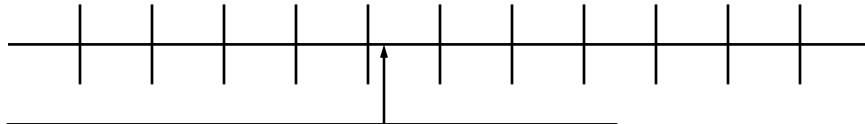
1975 - "Pong" home version released by Atari.



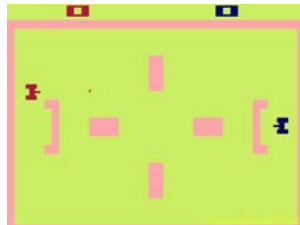
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## History of Computer Games

1955 1960 1965 1970 1975 1980 1985 1990 1995 2000 2005

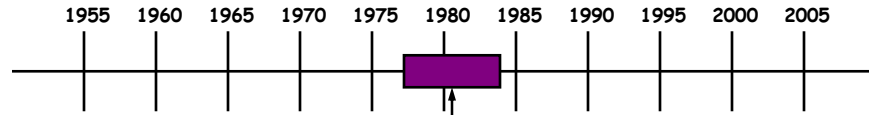


1977 - Atari 2600 Home Console Released  
Combat, Space Invaders.



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## History of Computer Games

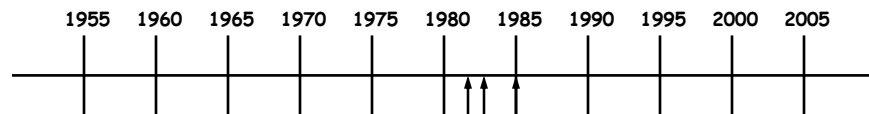


### Game Timeline - Atari 2600 Era.



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## History of Computer Games



1982 - Video Game Revenues \$2 billion.

1983 - The Video-Game Crash.

1985 - Video Game Revenues \$0.1 billion.

What happened?

- Market saturation.
- Stale game platforms.
- PC gaming.

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## History of Computer Games

1955 1960 1965 1970 1975 1980 1985 1990 1995 2000 2005

1985 - Nintendo Entertainment System  
Shigeru Miyamoto's Super Mario Brothers.



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## History of Computer Games

1955 1960 1965 1970 1975 1980 1985 1990 1995 2000 2005

1985+ - Nintendo Entertainment System Era.



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## History of Computer Games

1955 1960 1965 1970 1975 1980 1985 1990 1995 2000 2005

1991 - id releases Wolfenstein 3D.

1993 - id releases DOOM (John Carmack).



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## History of Computer Games

1955 1960 1965 1970 1975 1980 1985 1990 1995 2000 2005

MMO Era.



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## Game Industry Facts and Demographics

Reference: The Entertainment Software Association

<http://www.theesa.com/>

What's the **average age** of game players?

- 33

What percentage of gamers are **over 50**?

- 24%

What percentage of American **heads of households** play computer or video games?

- 69%

What percentage of gamers are **female**?

- 38%

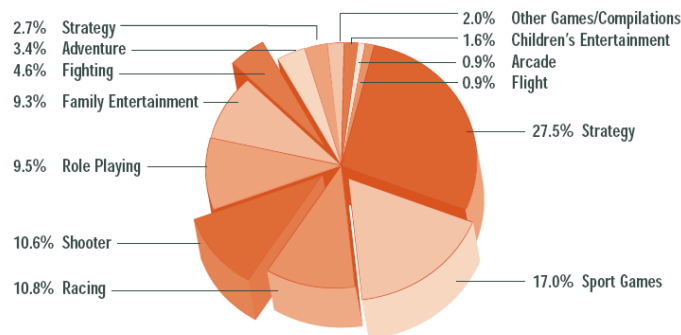
What percentage of game players say they play games **online** one or more hours per week.

- 49%

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## Who Plays What?

Best-Selling **Console Game Genres** by Units Sold, 2006.

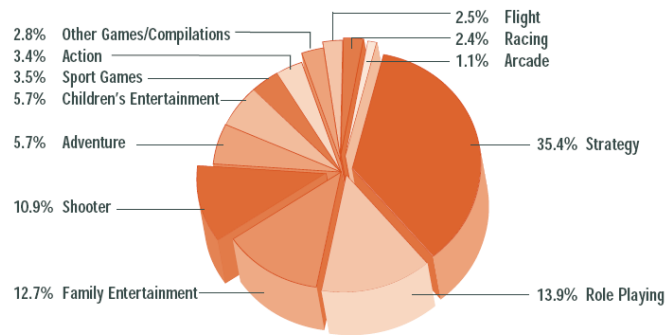


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## Who Plays What?

### Best-Selling PC Game Genres by Units Sold, 2006.



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## Who Plays What?

### Top selling Console Games by Units Sold, 2006.

RANK	TITLE	PLATFORM	RATING
1	MADDEN NFL 07*	PS2	E
2	NEW SUPER MARIOS BROTHERS	NINTENDO DS	E
3	GEARS OF WAR**	XBOX 360	M
4	KINGDOM HEARTS 2	PS2	E10+
5	MADDEN NFL 07*	XBOX 360	E
6	FINAL FANTASY XII	PS2	T
7	BRAIN AGE	NINTENDO DS	E
8	TOM CLANCY'S GHOST RECON: ADVANCED WARFIGHTER	XBOX 360	T
9	NCAA FOOTBALL 07	PS2	E
10	GUITAR HERO II	PS2	T
11	GRAND THEFT AUTO: LIBERTY CITY STORIES	PS2	M
12	GRAND THEFT AUTO: SAN ANDREAS	PS2	M
13	LEGEND OF ZELDA: TWILIGHT PRINCESS	WII	T
14	GOD OF WAR	PS2	M
15	MARIO KART	NINTENDO DS	E
16	WWE SMACKDOWN VS. RAW 2007	PS2	T
17	MIDNIGHT CLUB 3 DUB EDITION REMIX	PS2	E10+
18	GUITAR HERO BUNDLE	PS2	T
19	LEGO STAR WARS II: THE ORIGINAL TRILOGY	PS2	E10+
20	MADDEN NFL 07	XBOX	E

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## Who Plays What?

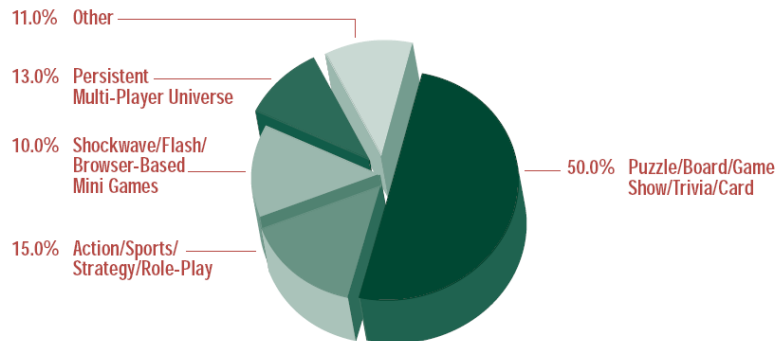
Top selling **PC Games** by Units Sold, 2006.

RANK	TITLE	RATING
1	WORLD OF WARCRAFT*	T
2	THE SIMS 2	T
3	THE SIMS 2: OPEN FOR BUSINESS EXPANSION PACK	T
4	ELDER SCROLLS: OBLIVION*	M
5	STAR WARS: EMPIRE AT WAR	T
6	THE SIMS 2 PETS EXPANSION PACK	T
7	AGE OF EMPIRES III*	T
8	THE SIMS 2: FAMILY FUN STUFF EXPANSION PACK	T
9	CIVILIZATION IV	E10+
10	THE SIMS 2 NIGHTLIFE EXPANSION PACK	T
11	GUILD WARS FACTIONS	T
12	ZOO TYCOON: COMPLETE COLLECTION	E
13	ZOO TYCOON 2	E
14	THE SIMS 2 GLAMOUR LIFE STUFF EXPANSION PACK	T
15	CARS: RADIATOR SPRINGS ADVENTURES	E
16	CALL OF DUTY 2	T
17	THE SIMS COMPLETE COLLECTION	T
18	LORD OF THE RINGS: BATTLE FOR MIDDLE EARTH 2	T
19	THE SIMS 2: UNIVERSITY EXPANSION PACK	T
20	WARCRAFT III BATTLE CHEST	T

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## Who Plays What?

Types of **Online Games** most Commonly Played, 2006.

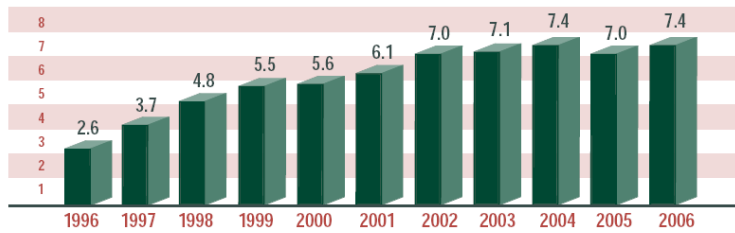


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## Who Plays What?

How Much Hard-Earned Money are we Blowing on Video Games?

**U.S. COMPUTER AND VIDEO GAME DOLLAR SALES GROWTH**  
DOLLARS IN BILLIONS



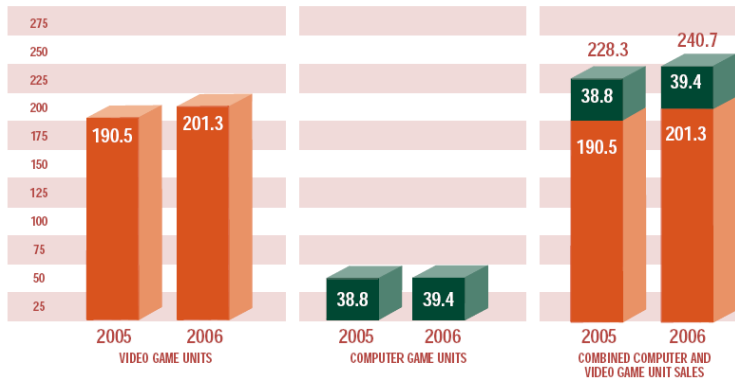
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## Who Plays What?

Console (Video) vs. PC (Computer) Game Sales

**U.S. COMPUTER AND VIDEO GAME UNIT SALES: 2005 AND 2006**  
UNITS IN MILLIONS



Source: The NPD Group / Point-of-Sale Information

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## Summary

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### Summary:

- Computer Games - overview
- History of Computer Games
- Computer Game Facts and Figures

### What's Next?

- Graphics programming for games