How big is US video game market?

- $100,000,000
- $1,000,000,000
- $10,000,000,000
- $100,000,000,000
- $1,000,000,000,000

Documents on Video Games

- History: Video Games: Behind the Fun (2000)
  - Available on Netflix
  - video.google.com/video?docid=4729349852188422392
- Discovery: History of Video Games (2006)
  - video.google.com/video?docid=3637639460474263378
- ON Networks: Play Value (2009)
  - www.annetworks.com/videos/play-value
- History of Video Games (WWW)
  - Documentaries on Video Games

Video Games: Overview

- History
  - Inventors & Games
- How
  - Design
  - 2D & 3D graphics
  - Motion Capture
  - Artificial Intelligence (AI)
- Good, Bad, Ugly
  - GWAP, RSI, Violence
- Future

The Beginning: Spacewar!

- First to gain recognition
  - Others had games before
  - "Conceived in 1961 by Martin Graetz, Stephen Russell, & Wayne Witanen"
  - Written for PDP-1 @ MIT
  - Inspired lots, widely ported
- Can still play this!
  - 1 Working PDP-1… in CHM
  - Java version available
  - www3.sympatico.ca/maury/games/space/spacemur.html
  - en.wikipedia.org/wiki/Spacewar!
  - www.computerculture.org
  - spacewar.oversigma.com

The Founding Fathers

- Ralph Baer
- Nolan Bushnell

Documentaries on Video Games

- Discovery: History of Video Games (2006)
  - Also on iTunes in HD 720p

GAMIFICATION OF BUSINESS!

Channeling the “gamer addiction” to earn virtual points, companies are now adding badges and rewards to things. E.g., Nike + (exercise game), Mint.com (encouraging savings), Foursquare (location-based social network), etc.

tech.fortune.cnn.com/2010/09/03/the-game-based-economy/
Shigeru Miyamoto

- The "Walt Disney" of computing gaming
  - Chief game designer at Nintendo
  - 1st elected to Hall of Fame
- Designed (among others):
  - Donkey Kong
  - Super Mario Bros
  - The Legend of Zelda
  - Super Mario 64
  - Nintendo DS, Wii

www.onnetworks.com/videos/play-value/shigeru-miyamoto
www.time.com/time/asia/2006/barcoes/bl_miyamoto.html
en.wikipedia.org/wiki/Shigeru_Miyamoto

History of Video Games: 1970s

- Golden age of video arcades
  - Pong, Space Invaders, Asteroids, Pac Man
- 1st gen consoles (1972–1976)
  - Magnavox Odyssey
- Mainframe computers
  - Hunt the Wumpus, Rogue
- Home computers
  - Type the program in!
  - Flappy, Tapes, Zork, others
  - Atari 2600, Intellivision, ColecoVision, Activision

History of Video Games: 1980s

- Genre innovation
- Gaming computers
  - Apple II, Commodore 64, Atari 800
- Early online gaming
  - Mostly text only, MUDs
- Handheld LCD games
- Video game crash of 1983
  - Atari buried millions of E.T.s in dump
  - Nintendo Ent. System (NES)
    - Super Mario Bros, Zelda, FF I
    - Gamepad introduced

History of Video Games: 1990s

- Decline of arcades
- Handhelds come of age
  - GameBoy, Sega Game Gear
- Mobile phone gaming
  - Sega Genesis, Super NES
  - PlayStation, Nintendo 64
  - With Super Mario 64
- Transition to 3D, CDs
  - Crash Bandicoot, Tomb Raider

History of Video Games: 2000s

- Mobile games
  - iPhone (games 1/4 apps)
- Sixth generation consoles (since 2001)
  - PS2, Xbox, GameCube
  - Return of alternate controllers (DVR, guitars)
- Online gaming rises to prominence
  - WoW, Ultima Online
- Rise of casual PC games
  - Bejeweled, The Sims

History of Video Games: 2005+

- Seventh generation consoles (since 2005)
  - Portables
    - Nintendo DS, PSP, iPhone
  - Consoles
    - PS3, Xbox 360, Wii
  - Increases in development budgets
  - Motion control
  - Revolutionizes play
    - Wii controller, iPhone
Example: Playstation 3 Hardware
- State-of-the-art system
  - But SW determines success!
  - (also, cool controllers help)
- 9 3.2GHz Cores (IPPE, 8SPE)
  - Power Processing Elt (IPPE)
  - Synergistic Processing Elt (SPE)
  - Where work gets done
  - During testing, one “locked out”
  - i.e., it didn’t work, shut down

Design of a Casual/Video Game
- Staff requirements
  - Can be done by one person, ala days of old
  - Bigger teams also (<10)
  - Lots of new developers
- Phones great platforms
  - iPhone dominates field
  - Students are signing up!
- Time to completion
  - Often only a few months!

Design of a Core Video Game
- Staff requirements
  - Cross-disciplinary
  - Producer, programmers, game, graphic & sound designers, musicians, testers, ...
  - >100 person teams
- Similar to film
  - Often, games>film, and film->games
  - Lucasfilm, etc. want to tie assets together

% of Parents “Games positive for kids”

How: 3D Computer Graphics
- Similar to making a 3D animated film...
  - Model characters, environment in 3D
  - Add shading + lights + effects + behavior
  - Let 3D rendering engine (on graphics card) do the work of figuring out 2D scene from 3D
- Limitations
  - Many things are too “expensive” to do in 3D frames per second
  - Research breakthroughs!

How: Motion Capture
- Actors in MoCap suits
- Motions recorded, put in “motion libraries”
  - E.g., running, throwing, passing, tackling
  - Can be edited/cleaned
  - Motion synthesis also
- Challenges
  - Motion “blending”
  - Non-“sliding” feel
  - UC Berkeley Research!
How: Artificial Intelligence

- Range of intelligence
  - Low: simple heuristics
  - High: learns from player
- Dynamic difficulty
  - Must hold interest
  - "Simple to learn, difficult to master is the holy grail of game design."
  - Cheating AI (e.g., racing)

Glenn Sugden: My Story

- Started game development in 1991
  - Worked until 1999 for Presage
  - Design and developed games for LucasArts, Interplay, Sierra Dynamics, Bradurbund.
    - The Incredible Machine for mac
    - Quake 2 for mac
  - Started own game development company…

Video Games: Good (Serious Games)

- Simulations for training
  - Flight simulations, combat, medical training
- Games w/a Purpose
  - A game to do useful stuff, hard for computers
  - Luis von Ahn … gwap
    - ESP: label images fastest
    - Gender Guesser
    - Papavideo: label video
    - Matchin: Pick best images

Video Games: Bad (RSI, addiction)

- Gamers Thumb
  - Caused with too much use of gamepad
  - I suffered this in 1980s!
  - Solutions?
    - Break timers, rest
- Video game addiction
  - Impulse control disorder
  - Stanford: yes, addictive!
  - "Gamers Wife"
  - Online gamers anon

Video Games: Ugly (Violence)

- Violent video games
  - Increase aggression, decrease "helping"
  - Others found no link
- High-profile incidents
  - Columbine kids loved the Doom video game
- Ratings help
  - Games “folk devil”
    - Billions $, kids at stake

Future of Video Games

- Media producers connecting assets
  - Disney, Lucas big players
- Controllers and sensors expand
- Games on Demand
  - OnLive
- Brain-Computer Interface (BCI)
  - Invasive and Non-