History of Computer Games

John E. Laird
Adapted by Matt Evett
Derived from The Ultimate Game Developer’s Sourcebook
The First Quarter: A 25 year history of video games, S.Kent
and sources on the WWW

First “games”

• 1952
  – TicTacToe:
    – A.S.Douglas on a EDSAC vacuum-tube computer
• 1958
  – Tennis for Two:
    • Willy Higginbotham on an oscilloscope connected to analog Donner computer

1960’s and Early 1970’s

• 1961-1962 SpaceWar! developed at MIT using vector graphics on PDP-1
• Sega releases Periscope:
  – electronic shooting game - first arcade game
1971-1974
Birth of Commercial Games

• 1971:
  – Nolan Bushnell & Nutting develops Computer Space
  – First commercial arcade game
  – Based on Spacewar
  – Vector graphics, but really cool real-time space game
  – Too sophisticated for market: Fails
• 1972:
  – Bushnell starts Atari
    Named after a move in Go
  – Odyssey by Magnavox – ‘Hockey’
    – First home TV game – analog not digital
    – 100,000 sold - $100/console
• 1973:
  – Pong in Arcades by Atari
    – Sold by Magnavox
    – A huge hit in bars, pinball arcades, ...
• 1974:
  – Kee releases Tank
    – Fake spinoff from Atari
  – First game to use ROM
    – Atari:
      – First racing game (Trak 10) & maze chase game (Ghosts).

1972-1976

• Adventure: The Colossal Cave
  – William Crowther and Don Woods
  – First text-based adventure game
  – Ran on DEC mainframes (PDP-10)

Late-70’s: Atari Expands

• 1976: Bushnell sells Atari to Warner for $26 Million
  – Warner markets Pong to home as a single game
  – Breakout designed by Steve Jobs and Steve Wozniak
• 1977: Atari introduces the 2600 VCS
  – First home game console with multiple games
  – 2K ROM, 128 Bytes of RAM
  – Very successful – 4M sold by 1980
• 1977: Apple starts selling the Apple II
• 1978:
  – Adventure for Atari comes out
    – Sold 1M copies, first Easter Egg
    – First action/adventure game
  – Space Invader developed by Taito in Japan
• 1979:
  – Activision is formed by Atari developers
    – Third party development houses start up
    – Atari 800 introduced - 8-bit
    – First MUD by Trubshaw & Bartle
    – First online multiplayer game

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1980-1981: Rise

• 1980:
  – Philips Odyssey2 (1978) and Mattel Intellivision
  – Mattel had better graphics, but terrible controller
  – Namco has Pac-Man
  – >$1 billion ($2.3 in 1997 dollars)
  – 300,000 arcade units sold since introduction
  – Atari doing $1 billion;
  – Asteroids & Battlezone released
  – Williams releases Defender
  – Zork released by Infocom, Ultima released

• 1981:
  – Game industry > $6 billion in sales
  – Nintendo: Donkey Kong [converted Radarscope]
  – Galaxian, Centipede, Tempest, Ms. Pac-Man
  – IBM introduces the IBM PC

1982: Clouds ahead

• Atari sales down 50% -- starts to loses $$’s
  – Releases 5200
  – But it still controlled 80% of the market
  – Atari buys rights to ET for $22 Million
  – Produced more PacMan cartridges than systems

• Activision releases Pitfall

• ColecoVision gets Donkey Kong

• Game companies start just for home computers
  – Sierra On-Line, Broderbund, BudgeCo

• Electronic Arts is formed

1983: Crash

• Mattel losses $225 million from Intellivision
  – Doesn’t ship the Aquarius
  – Loses as much as it had made the four prior years.

• Atari loses money
  – Market flooded with poor quality games:
    – Fox, CBS, Quaker Oats, Chuck Wagon dog food

• Coleco crashes
  – Saved by Cabbage Patch Kids

• Commodore 64 - home computer
  – 17-22 million total sold

• Dragon’s Lair released
  – Laserdisk
  – 6 years to make - Bluth Studios
Crash & Resurgence

• 1984:
  - Industry drops to below $800 M
  - Apple introduces the Macintosh
  - Birth of modern computer: good resolution, sound
  - Games not a priority
  - 100,000 sold in first six months
  - King’s Quest is released by Sierra On-Line

• 1985:
  - Nintendo introduces Nintendo Entertainment System
    - Strict control on software
      - Lockout chip, and restricts companies to 5 games/year
      - Nintendo sells cartridges to software distributors
  - Atari tries to come back with 16-bit 520ST
    - Computer and Game system
  - Carmen Sandiego released by Broderbund

Failed Competition

• 1986:
  - Commodore ships Amiga: cool but marketing kills it.
    - Computer system designed to support games – 3D color
      - Developed by Atari hardware engineer Jay Miner.
  - Sega ships Sega Master System console.
    - Technically superior to Nintendo, but it ignores third-party developers and fails because of lack of games (and maybe Nintendo pressure on developers).
  - Atari ships 7800
  - Nintendo outsells competitors 10 to 1

1987-1989

• 1987:
  - Electronic Arts releases their first in-house game:
    - Skate or Die.
  - Serious games start to show up for IBM PC’s.
    - VGA and SVGA help.
• 1988:
  - Tetris imported from Soviet Union
  - Coleco files for bankruptcy
• 1989:
  - Sega Genesis is released: 16-bit
    - Attack's console market with EA sports titles
    - Aggressive marketing at older market (> 13 year old)
  - Nintendo sticks with 8-bit
    - Releases GameBoy
  - Maxis releases SimCity
Console Wars

• 1990:
  - Nintendo releases Super Mario 3 - all-time best-seller 11M
  - Amiga and Atari ST die out
  - PC’s and Consoles are major game platforms
  - Electronic Arts starts to acquire other game publishers

• 1991:
  - Nintendo launches Super-NES (16-bit)
  - S3 introduces first single chip graphics accelerator for PC
  - Capcom releases Street Fighter II for arcades – big hit
  - id releases Wolfenstein 3D

• 1992:
  - PC gaming explodes
  - Nintendo has $7 billion in sales ($4.7B in U.S.)
  - Has higher profits than all U.S. movie and TV studios combined
  - Midway releases Mortal Kombat for arcades – extreme violence

More Wars

• 1993:
  - Pentium chip is launched
  - Consoles (Sega and Nintendo) are 80% of game market
  - Panasonic ships Real-3DO: 32-bit (now out of business)
  - Civilization published

• 1994:
  - Atari ships Jaguar: 64 bit
    - Very expensive for console –$700, >$100/game
    - Neither 3DO or Jaguar does particularly well
  - DOOM released by id
  - MYST released
    - all time biggest selling PC game until 2002

32-bit Wars

• 1995:
  - Sega ships Saturn (32-bit)
  - Sony ships Playstation (32-bit)
  - Microsoft releases Window 95
    - Includes the Game SDK - Direct-X
    - Bring major game performance to Windows
  - Internet and WWW expand
  - Full-motion video becomes a part of games
    - 7th Guest
Playstation

- Launched in U.S., Sept. 1995
- 300,000 polygons/sec., 30MIPS processor, 4MB RAM, 2MB VRAM
- 400 U.S. Titles
- 20% penetration in U.S. homes
- Analysis:
  - Multi-platform games look worse on Playstation
  - Playstation-only games look good, but grainy
  - Cheap and lots of them for software developers

1996-1998

- 1996:
  - Nintendo ships Ultra 64
    - Originally promised for 1995
  - Multi-player gaming goes commercial
    - Via modem and internet and network companies
      - TEN, Mplayer, …
- 1997:
  - 3D acceleration starts to standardize on 3D-FX
    - Games start to assume 3D acceleration
  - Pentium II’s at 200Mhz make “serious” game machines
  - Ultima Online launches – first MMORPG in 3D
- 1998:
  - Lots of good PC games
  - Playstation rules consoles

Nintendo 64

- Launched in U.S., Sept 1996
- 93.75 MHz 64 Bit CPU, 64-bit MIPS co-processor
  - over 500,000,000 16-bit operations/sec
  - Built-in Pixel Drawing Processor (RDP)
- 4.5MB RAM, 150,000 polygons/sec
- Originally aimed at younger market
- Cartridge makes is very expensive
- Very dependent on software
- Legend of Zelda: Ocarina of Time generates more revenue in last 6 weeks of 1998 than any film
1999-2001

• 1999
  – Dreamcast
    – Maximum Score for Pac-Man Achieved
      Billy Mitchell achieves the highest possible score for Pac-Man
      when he completes every board and winds up with a score of
      3,333,360.
    – EverQuest is launched

• 2000
  – Development moves from PC to consoles
  – Playstation II
  – Diablo II sells 1 million units in 1 week
  – SIMS sells 2.3 million units ($95M)
    • + 1.4 mill. in expansions

• 2001
  – Gamecube (Nintendo)
  – Xbox (Microsoft)

Sega Dreamcast

• Sept. 1999, $299 ($99 -> $49 -> $0), 128 bit
• Hitachi 200 MHz CPU, PowerVR 3D, 16MB RAM
  – But faster than a 400MHz Pentium II for 3D
  – 3M polygons/sec
  – Fast CD-ROM loads
• Moderately successful in U.S.
  – But not in Japan

Sony Playstation 2

• Launched May 4, 2000 in Japan
  – In U.S. on October 26, 2000: $299
  – 90 Million sold world wide by 2005 [2 years < PS1]
• Hardware
  – 128 Bit 300MHz processor
  – 3 Special purpose 150 MHz co-processors
  – 32MB DRAM: 3.2 GB/sec
  – DVD & CD
  – MPEG2 hardware
  – Dual Shock 2 analog controller
    – Chip set will be available for other platforms
  – 66M polygons/sec geometry – 16M polygons/sec curved
• Software development is tough
Nintendo GameCube

- Launch in Japan, Fall 2001
  - U.S. Nov. 2001
- Hardware
  - IBM Gekko processor 405 MHz
  - Geometry Engine
  - Mini-DVD
  - 6-12M polygons/sec (fully textured)
  - 24MB Main memory
  - 16MB A-memory
- Emphasis on easier development
  - High memory bandwidth 3.2 GB/sec
  - Fast frame buffers (5ns.)

Microsoft Xbox

- November 2001
- Software
  - Direct X API
- Hardware
  - Pentium IV 733 Mhz
  - Custom 3-D 300Mhz GPU
  - 64MB Ram – 6.4 GB/sec
  - 8GB hard drive
  - DVD
  - 100 Mbps Ethernet
- Performance
  - 150 million transformed and lit polygons per second
  - 100+ million polygons per second sustained performance (shaded, textured)
  - 300 million micropolygons/particles per second
  - 4 simultaneous textures
  - Full-scene anti-aliasing
  - 1920x1080 maximum resolution
  - HDTV support

PC 2002

- Americas Army released as free game
- SIMS becomes the best-selling PC game of all time (March 2002)
**PC 2003**

- **PC**
  - SIMS continues to grow
  - Unleashed, Superstar
  - But SIMS Online fails
  - Star Wars Galaxies
    - > 275,000 Registered Users
    - Second biggest MMOG, fastest growing
  - Warcraft III, UT 2003, GTA, ports from console
  - Second Life and There.com launch
    - Different approach to MMOG
  - EA grosses $2.5B in 2003

**Games 2004**

- **$7.3 B sales**
- Madden sells 1.3M copies in one week
- Sequels rule: SIMS 2, Halo 2, Half-life 2, Doom
- **Consoles: 2004**
  - Stable of slow growth – lower prices
  - 1,000,000 GBAs sold
  - Nokia Ships >1,000,000 N-Gages
- **Nintendo Launches DS**
  - >5 million units worldwide by March 2005
  - Ninetendogs – 250K in one week – best handheld?
- **Sony Launches PSP**
  - 5 million units shipped by July 2005
  - Where are the games
  - Shifting away from PC (15% sales) to Consoles

**Games 2005**

- **World of Warcraft**
  - 4 Million Subscribers ($700M/year subscriptions)
- **EA rolls along**
  - Madden NFL 2006, sold 1.7M in first week
- **Gamestop and EB games merge**
- **Top selling games May**
  - GBA Pokemon Emerald: 882,579
  - PS2 Starware Episode II: Revenge of the Sith – 490,679
  - XBX Starware Episode II: Revenge of the Sith – 378,195
  - XBX Forza Motorsport – 194,956
  - PS2 Midnight Club 3 – 150,470
- **Top Selling PC Games: July 2005**
  - Battlefield 2
  - World of Warcraft
  - Guild Wars
  - The Sims 2: University
  - The Sims 2
- **Next Gen Consoles coming**
  - Difficult software development
  - Very expensive for development (teams twice size)
XBOX 360

- Available: November 2005
- Custom IBM PowerPC CPU
  - 3 symmetrical cores: 3.2 GHz each
  - 2 threads/core
  - VMX-128 vector unit/core
  - 1MB L2 cache
  - CPU Game Math: 9.6B dot product/sec
- Custom ATI Graphics Processor
  - 10MB DRAM
  - 4-way parallel floating point
  - Unified shader architecture
  - 520 million triangles per sec
  - 16 gigasamples/sec
  - 40 billion shader operations/sec
  - Supports 16:9, 720p or 1080i - HD output
- 512 MB of 700MHz GDDR3 RAM
  - unified memory architecture
  - 22.4 GB/s interface bus bandwidth
  - 256 GB/s memory bandwidth to EDRAM
  - 21.6 GB/s front-side bus
- Overall system floating-point: 1 teraflop
- Detachable and upgradeable 20GB harddrive
- 12x dual-layer DVD ROM

Playstation 3

- 8-9 (?) Cell processors 3.2 GHz each
- Graphics: Nvidia 550 Mhz GPU 1.8 TFlops
  - 100 billion shader ops/sec
  - 51 billion dot products/sec
  - More powerful than Geforce 6800 Ultra?
- Total 2.18 TFlops
- 512MB RAM
  - split between CPU and graphics
- 512KB L2 cache
- 7 AltiVec vector processing units
- Blu-ray DVD may make it very expensive
  - Don’t be surprised by delay
- Removable hard drive

Future?