Computer Gaming and VR

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OXO – Noughts and Crosses

9 8 7 NOUGHTS AND CROSSES
6 5 4 BY
3 2 1 A S DOUGLAS, C.1952

LOADING PLEASE WAIT…

EDSAC/USER FIRST (DIAL 0/1): 1
DIAL MOVE: 6
DIAL MOVE: 1
DIAL MOVE: 2
DIAL MOVE: 7
DIAL MOVE: 9
DRAWN GAME…

EDSAC/USER FIRST (DIAL 0/1):
Tennis For Two (1958)
Spacewar!

• Spacewar! (1962) by Steve Russell, MIT

• Demonstration of PDP-1 computer

• Huge success, Spacewar! later installed with every shipped PDP-1

• Spread around ARPAnet
Spacewar! (1962)
The First Arcade Games

• 1971: Nolan Bushnell turns Spacewar! into the world’s first coin-op arcade videogame
• Bushnell founds Atari in 1972
• First product: PONG
PONG (1972)
Arcade Innovations

• Shark Jaws (Atari 1975) featuring animated characters
Arcade Innovations

- Night Driver (Atari 1976) first person driving game
Arcade Innovations

• Galaxian (Namko 1979) first ever color arcade game
Arcade Success

- Space Invaders (Taito 1978) is a huge success in Japan and U.S.
  - Japanese government has to quadruple Yen production because of coin shortage
- First arcade game licensed for a home console (Atari VCS)
- Puckman (Namco 1980), named Pac-Man in U.S.
- Donkey Kong (Nintendo 1981)
Arcade Success

- In 1982, the arcade videogame industry makes three times as much money as the movie business!
Computer games and game players: What

• Often complex, difficult, involving, thought-provoking, interactive (as opposed to reactive), graphically intense, instantaneously responsive, multi-threaded, multi-interface, social multiplayer games.

• Video games have been around for ~30 years. Old enough to be considered no longer a “fad”, more a mainstream entertainment culture.

• Things have moved on a bit in those 30 years. Take tennis, for example:
There are many, many surveys. Most focus on the US games market. Key trends and facts:

- About 35% to 45% of computer game players are female.
- Average number of years adult gamers have been playing computer or video games: 12
- Game play is displacing other media-centric activities, especially watching television. Online game play is a key driver in Internet use and broadband take-up.
Computer games and game players: Why

Lots of research into this, especially learning psychology. Two (related) oft-said questions:

1. “Why does someone voluntarily do the same repetitive task in a game over and over?”

2. “How can this enthusiasm / keenness / determination / focus be transferred to learning situations?”
...and here’s **why** (Question 1)

- Because games are *difficult*.
- In addition to *completing the game*, there is the challenge of figuring out what to do and how to do it i.e. *mastering the game*.
- They present a challenge (like crosswords, Sudoku).
- They appeal to the curiosity of people.
- Often a game presents instant feedback to the player on his or her actions.
The learning curve of a good computer game is:

- not too easy (will get bored)
- not too hard (will get frustrated)
- something that opens up new parts of the game (and provide other “rewards”) in return for in-game skill development.
- encouraging a sense of “just one more go” in the player.
Learning

...using computer games
Computer games in learning: **how**?

“Games are widely used as educational tools, not just for pilots, soldiers and surgeons, but also in schools and businesses…. Games require players to construct hypotheses, solve problems, develop strategies, learn the rules of the in-game world through trial and error.

Gamers must also be able to juggle several different tasks, evaluate risks and make quick decisions…. Playing games is, thus, an ideal form of preparation for the workplace of the 21st century, as some forward-thinking firms are already starting to realize.”

The Economist, August 4, 2005
Examples of computer Games in Education

- Historical simulations
- Planning and architecture
- Problem solving (instant response)
- Economics and financial management
- Literacy *(major success with Myst)*
- Physics (gravity, vectors, acceleration)
- Chemistry
- Cultural studies and religion

Cross-curricula games tend to be very popular
Computer games in Getting Fit!

• Dance Dance Revolution and similar installed in many schools and colleges in the US (every school in West Virginia).
Online Gaming

Where things get really interesting...
Who’s playing what?

MMOG Active Subscriptions 21.0
120,000+
World of Warcraft

World of Warcraft is a massively multiplayer online role-playing game (MMORPG). You explore, and team up with people to complete quests, elevating your status.
World of Warcraft

February 2010:

• 11.5 million subscribers worldwide
• 22% in US, 17% Europe, 48% in Asia
• 20% female worldwide
• Average US player is online 22.7 hrs./wk

At any given time over 500,000 subscribers are online!
What’s happening cognitively?

• Socially & materially distributed cognition.
• Collaborative problem solving, multiple problem spaces.
• Coordination of people, (virtual) tools, artifacts, & text.
• Constellation of literacy practices across multimedia, multimodal ‘attentional spaces’ (Lemke).
What’s happening cognitively?

• Empirical model building (exploits, mods).
• Negotiation of meaning & values within community.
• Authoring of identities within & beyond the community.
Information searching within the game

• Textual “clues” rare inside the game
• Clues are often abstract or symbolic
• Often a time-critical element for finding information (“must work out how to do X before Y happens”)
• Clues are often recursive: Do A to find B to give to C who will give you D etc…
• Gamer can thus mentally keep track of:
  • several things that need to be done
  • status of current objectives
  • people
  • places
  • information
  • items
Second Life

- Its currency system (Linden dollar) pegged to real world currencies
- Furniture, clothes, art, buildings, libraries being built by individuals and groups of people
- IBM and others buying islands and running training courses for their staff
- 400,000 users, and 3,100 businesses set up within “real” estate
- The BBC hold concerts within Second Life…
Computer Gaming and Gender
In the beginning…
Later…

NO ONE’S SURPRISED THIS STORY IS CAPABLE OF THIRTEEN CLIMAXES.
Or...
Demographics of the Games Industry

- Art and Design: 91% M; 9% F
- Programmers: 98% M; 2% F
- Sr. Management: 95% M; 3% F
- Sales/Mrkting/PR: 74% M; 26% F

*From *Chicks and Joysticks: An exploration of women and computer gaming*, commissioned and published by ELSPA 2004
How are Women Depicted in Computer Games?

- Poorly (and inappropriately) clothed – “What’s with the chain-mail bra?”
- “Conflating seduction with threat”
- “Dead sexy”
- “A femme fatale”
- “Evil and dangerous”
- “A seductress with blades for hands, both castrating and phallic”
girls of gaming

A celebration of gaming's greatest females and the people who made them

Dead Sexy BloodRayne

With a movie and video game sequel in the works, gaming's hottest hybrid is hotter than hell
EverQuest: The Scars of Velious
Meet the women of Def Jam® FIGHT For NY™: Carmen Electra, Cindy Johnson, Kimora Lee, Lil’ Kim, Shaniqua, and Shawnna. You’ll have the opportunity to win the hearts of these lovely ladies in a fight in The Babylon Club. Good Luck!
Result of Gendered Gaming?

- Proliferation of male genres
  - Shooters, sports simulations
- Magazine ads targeting males
- Sometimes the proliferation of gendered computer games is one of the reasons given for the dramatic decline in the participation of women in computing in general
- Dramatic rise in prevalence of “virtual sex” in games, in which computer-generated women are exploited
Figure 1. Computer Science Listed as Probable Major Among Incoming Freshmen
Source: HERI at UCLA
The second best thing to do in the dark.
An On-line Virtual Woman
Gaming and Racial Stereotypes
Gaming and Racial Stereotypes
My Experience

• Lego Robots
  (introduction to engineering design)

• Second Life
  (introduction to computer science)

• Xbox Game Development
  (C#, interactive game development)
Educational Approach

• Provide rudiments of a wide variety of technical material

• Show students how and where they can learn more

=> Students are motivated to learn additional material needed to solve particular technical problems.

• Contest/capstone at end of semester
Seymour Papert
Former Director of the Epistemology and Learning Research Project at M.I.T.

Constructionism

- Learning and the acquisition of knowledge are active processes engaged in by the learner.
- Knowledge is thus "constructed" by the learner.
- The learning process is enhanced when the learner is building something real in the world, in addition to building knowledge inside his or her own mind.
Malcolm Knowles

**Theory of Self-Directed Learning**

- Education is a life-long process; as people grow older, they learn more from experience than from books.
- Students tend to learn more from the necessity of accomplishing a particular task, rather than from an abstract desire to know more.
- Task-centered, instead of subject centered, approach to learning
How are these ideas applied?

Task-centered, self-directed, and independent students seem to be just what we want.

⇒ Provide the means to solutions, rather than the solutions themselves, when students encounter technical obstacles.
Course Format

• 3 hours lecture per week
• 4 hours scheduled lab per week
• 8 hours optional lab per week
• 24-7 lab access

=> Can't be creative on demand
Using Second Life to Teach CS

• Students create artifacts of interest to them, and then imbue these artifacts with behavior using programming.
• Key idea is to give students a “need to learn”
• LSL is C/Perl/Python/IYFLH-like
  • Language neutrality is a good thing
• LSL embodies notion of state in language
• OpenSim allows local hosting
• OpenSim also supports C# programming