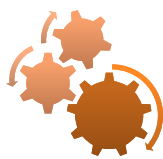


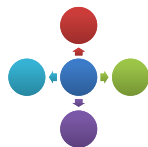


Agenda



Game Design and Quality Aspects

- Accessibility und Usability
- Research



Interface Alternatives

- Examples, Kits and Thoughts



Alternate Reality Games

- Mixed reality gaming

learning by experience:

„Ein Großteil der kognitiven Entwicklung und der Entwicklung von motorischen Fähigkeiten findet durch Spielen statt...“ (unknown ;-)



Accessibility and Usability Issues



Game Design

- Usability: **one piece in the game design puzzle**
- Other issues are equally important
 - Story
 - Pacing
 - Music
 - Voice acting
 - Artwork
 - Challenge level
 - Etc.
- **Heuristics provide a new way** to address single player usability issues during the design process

Source: David Pinelle, Nelson Wong (2008) Heuristic evaluation for games: usability principles for video game design, Proceedings of Proceedings of the ACM Conference on Human Factors in Computing Systems (CHI 2008), 5-10 April 2008, Florence, Italy.



Game Design Research

- game design principles
 - Clanton, C. (1998). An interpreted demonstration of computer game design. In *Proceedings of CHI '98* (Los Angeles, CA, April 1998), ACM Press.
- game heuristics
 - Federoff (2002) game heuristics that focus on three areas: game interface, game mechanics, and game playability
 - Desurvire et al. (2004) Heuristics for Evaluating Playability (HEP)
- survey method
 - .P. Davis, K. Steury, R. Pagulayan, (2005) "A survey method for assessing perceptions of a game: The consumer playtest in game design, Game Studies: The International Journal of Computer Game Research, vol. 5
http://www.gamestudies.org/0501/davis_steury_pagulayan/



Game Design Research

Definition Heuristik:

Gerd Gigerenzer definiert wie folgt: "Als Heuristik bezeichnet man eine Methode, komplexe Probleme, die sich nicht vollständig lösen lassen, **mit Hilfe einfacher Regeln und unter Zuhilfenahme nur weniger Informationen** zu entwirren.,,

Source: <http://de.wikipedia.org/wiki/Heuristik>

Heuristic Game Evaluation



Game Design Research

Problems	
1. Unpredictable / inconsistent response to user's actions	42
2. Does not allow enough customization	11
3. Artificial intelligence problems	22
4. Mismatch between camera/view and action	23
5. Does not let user skip non-playable content	6
6. Clumsy input scheme	21
7. Difficult to control actions in the game	31
8. Does not provide enough information on game status	28
9. Does not provide adequate training and help	36
10. Command sequences are too complex	20
11. Visual representations are difficult to interpret	16
12. Response to user's action not timely enough	29

David Pinelle, Nelson Wong (2008) Heuristic evaluation for games: usability principles for video game design, Proceedings of CHI '08

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Gaming Interfaces- IAS/ISYS

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Game Over!
Because no one can save the Universe...

- Game Over!" is the world's first (and hopefully only) universally *in*accessible game.
- Game Over! is available as freeware.



Demo

Source: <http://www.ics.forth.gr/hci/ua-games/game-over/>

Grammenos, D. (2008). Game Over: Learning by Dying. Proceedings of Proceedings of the ACM Conference on Human Factors in Computing Systems (CHI 2008), 5-10 April 2008, Florence, Italy.

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Gaming Interfaces – IAS/ISYS

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UA - Games

- Universally Accessible Games (UA-Games) constitute a research activity of the [Human-Computer Interaction Laboratory](#) of [ICS-FORTH](#).
- Grammenos, D. and Savidis, A. (2006). Unified Design of Universally Accessible Games (Say What?). Gamasutra Feature article, December 7, 2006. Available on-line at: http://www.gamasutra.com/features/20061207/grammenos_01.shtml

Only few good examples:

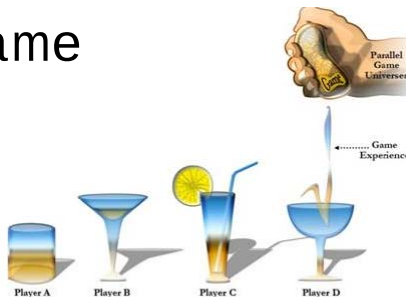
- http://allinplay.com/home_.html
universally designed for the blind and sighted to play together as equals.
- <http://www.terraformers.nu/>
The game is a visual / audio hybrid playable by both sighted and sight disabled / blind.



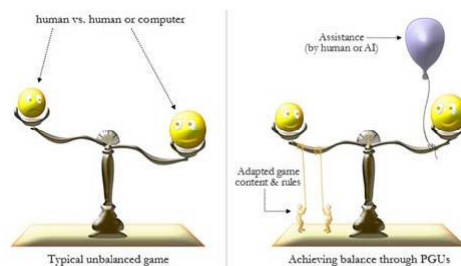
Parallel Game Universes

Basic idea

Allow each player to play in a different universe
then somehow project each universe into a single one



- Source: <http://www.gamasutra.com>





Parallel Game Universes

The potential impact of the PGUs theory is five-fold, since it:

- opens up and enhances an **entertaining social experience** that would otherwise be unavailable to a significant percentage of people;
- allows for **social interaction** among people who may never have (or even could have) interacted with each other;
- provides a novel approach for developing massively **cross-platform** multiplayer games;
- considerably expands the **life-cycle** of games, as well as the size and composition of their potential market;
- creates a **new model for producing games** on different platforms, as well as accessible games, since a company may sell the rights to, or subcontract, a specialized group for developing PGUs for specific platforms or user groups.

Source: http://www.gamasutra.com/features/20060817/grammenos_07.shtml

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Game Accessibility

- a research project that focuses on the accessibility of electronic games **for gamers with disabilities**.
- Gamers
 - visually disabled
 - auditory disabled
 - physically disabled
 - learning disabled

Source: <http://www.game-accessibility.com/>

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Gaming Interfaces IAS/ISYS





Game Accessibility SIG

- was formed to help the game community strive towards creating mainstream games that are universally accessible to all, regardless of age, experience and disability.
- Reader:
http://www.igda.org/wiki/Game_Accessibility_SIG/Articles

Source: http://www.igda.org/wiki/Game_Accessibility_SIG



Interface Alternatives

Women?

- Still often-neglected consumer segment
- More likely to play puzzle and role-playing games?
 - A la The Sims
- Women tend to spend more on services related to mobile devices than do men

Source: Soh and Tan (2008), Mobile Gaming, Communications of ACM March 2008/Vol.51,No3 p.35-39

Image: "Computer Space" (1971) is a first ever arcade game

- Spacewar! clone created by Nolan Bushnell
- interface is mostly buttons
- has not become very popular since its rules were too complex

Source: Bowman, Kruijff, Laviola, Pouprev; 3D User Interfaces: From Lab to Living Room, Course Notes at CHI2008, Florence



Audio Games

- <http://audiogames.net/>
- Game design students of the [Utrecht School of the Arts](http://www.audiogames.net/playcenter/index_exp.php) produce





Audio Game Maker

- a free application which enables visually impaired people to make their own sound-based computer games.
- Bartiméus Accessibility Foundation (NL) 



Source: <http://www.audiogamemaker.com/>

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Alternate Gaming – IAS/ISYS



Single-Switch Games

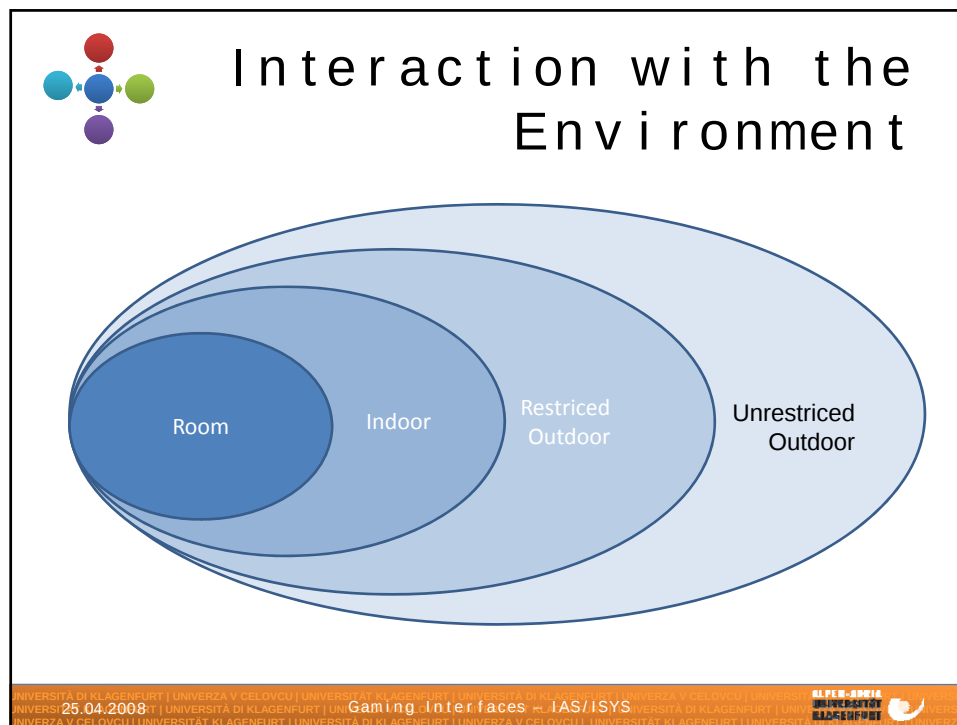
- ... 'assistive technology' aimed at moderate to severely learning/physically disabled people.
- <http://oneswitch.org.uk/>



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Alternate Gaming-IAS/ISYS





Mobile Gaming

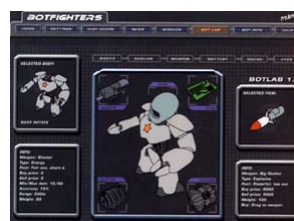
- Near future
 - Better processing power
 - Enhanced 3D graphics performance
 - Better audio capabilities
- Developers create versions of existing games
 - FIFA Football and Tiger Woods Golf

Source: Soh and Tan (2008), *Mobile Gaming, Communications of ACM*
March 2008/Vol.51,No3 p.35-39



MMOG - massively multi-player online games

- Large number of gamers collectively play
 - individually, as team (clan)
- in a shared digital world, i.e. persistent game universe
- Well defined set of goals
- E.g. Botfighters – a mock combat game - It's Alive (2000)
 - one of the world's first mobile games to take advantage of **location-based services**
 - Award of Distinction in the Net Vision category in the Prix Ars Electronica



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Gaming Interfaces IAS/ISYS

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Handheld AR

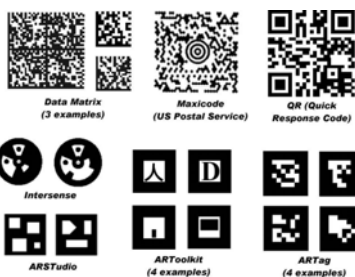


Image: Mark Fiala, (2005) ARTag, a Fiducial Marker System Using Digital Techniques
2005 IEEE Computer Society Conference on Computer Vision and Pattern Recognition (CVPR'05) - Volume 2 pp. 590-596

- <http://www.icg.tu-graz.ac.at/pub/pubobjects/experienceswithhandedar/>
- ★ Video Demo



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Markelless AR

- Georg Klein and David Murray
Parallel Tracking and Mapping for Small AR Workspaces
In Proc. International Symposium on Mixed and Augmented Reality (ISMAR'07, Nara)
Won the best paper prize



<http://www.robots.ox.ac.uk/~gk/youtube.html>



Innovative 3DUI



Tohiba Bubble Helmet - gives a **360-degree panorama view** when watching movies or playing games.

Innovative 3DUI

- E.g. Swordplay (Brown University 2008)
 - http://www.cs.brown.edu/courses/cs196-2/2008/Groups_files/swordplay/index.html
 - Simply download a [desktop version](#) to a Linux machine!!!
 - [Demo Video](#)
- Innovating game development
 - <http://www.cs.brown.edu/courses/cs196-2/2008/Groups.html>



3DUI Game Development Studio

- Microsoft XNA 2.0
<http://msdn2.microsoft.com/en-us/xna/default.aspx>
Basis of development environment
 - Audio support vector/matrix tools
 - Physics engine
 - Version modified to handle 3D DLP stereo!
- Custom build XNA components
 - Scenegraph
 - Wii controller API
 - Head tracking
- Free Download:
<http://www.eecs.ucf.edu/~jjl/isuelab/3DUIGamestudio>
- DLP Format:
http://www.dlp.com/hdtv/3-d_dlp_hdtv.aspx



Physical Interfaces

- Phidgets
(Greenberg and Fitchett 2001)
 - Low cost sensing/control based on USB
 - Sensors
 - Touch, light, force, vibration, rotation
 - Accelerometers, switches, RFID, etc..
 - www.phidgets.com

Reference: Greenberg, S., Fitchett,C., (2001) Phidgets - Easy Development of Physical Interfaces through Physical Widgets, Proceedings of the UIST2001, p. 209-218

Source: Bowman, Kruijff, Laviola, Pouprev; 3D User Interfaces: From Lab to Living Room, Course Notes at CHI2008, Florence



Physical Interfaces

- I-CubeX (Mulder 1995)
 - uses the Musical Instrument Device Interface (MIDI) communicating control information
 - also Bluetooth
 - Similar advantages to Phidgets
 - No microcontroller programming
 - No circuit design
 - Software API
 - Sensors
 - air, touch, bend, temperature, magnetic, light, tilt, ...

http://infusionsystems.com/catalog/info_pages.php?pages_id=137





Future of Interfaces

(save)

- Many, many more game interfaces with **cheap hardware**
- Cell phones, cell phones, cell phones,...
- Computer-vision based work on **tracking and recognition**
- ...
- Hopefully more evaluation 🍷🍷🍷



Source: Bowman, Kruijff, Laviola, Pouprev; 3D User Interfaces: From Lab to Living Room, Course Notes at CHI2008, Florence



Future of Interfaces (speculative)

- Flexible Screening (depersonalization of screens)
- In-body interfaces (if you like it or not ?)

Source: Bowman, Kruijff, Laviola, Poupre; 3D User Interfaces: From Lab to Living Room, Course Notes at CHI2008, Florence

- Media Spaces (Bill Buxton et al.)
 - In a media space, people can create real-time visual and acoustic environments that span physically separate areas.
 - Based in systems a la <http://www.AccessGrid.org>
- Walkout-and-use Interfaces
 - Tangible interfaces
 - Unobstrusive tracking (based on natural feature extraction)



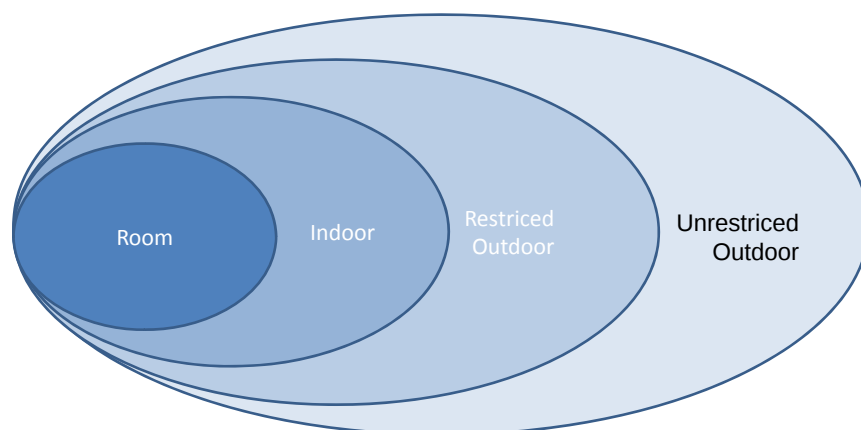
Alternate Reality Games

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Interaction with the Environment



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Interactive Game Shows

- Hardware: Responsive Control from Responsive Innovations
- <http://www.responsiveinnovations.com/>

[illegible]

ARGs - Alternate Reality Games

- A new genre of digital gaming
- **Blur the distinction** between a player's experience in **the digital world inside the game** and **the real world outside** the game.
- The game universe is not explicitly limited to a particular piece of software or set of digital content

Source: Kim, Allan and Lee (2008), Alternate Reality Gaming, Communications of ACM February 2008/Vol.51,No2 p.36-42

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ARGs

- Examples

- The Beast (2001) promoting the Movie „AI“
 - Microsoft promoting Spielberg!
 - Lead Community: <http://www.cloudmakers.org/>
- ILoveBees (2004) viral marketing campaign for, the *Halo 2* video game(XBox)
 - <http://www.wired.com/culture/lifestyle/news/2004/10/65365>
- World without Oil simulation (2007)
 - <http://worldwithoutoil.org/>
 - Riding on top of existing, proven community building tools like LiveJournal, Vox, [Youtube videos](#), podcasts, and the phone (anyone can call in and leave a message for other players to hear).
- Perplex City
- Lonelygirl15 (www.lonelygirl15.com)



ARGs

- Features

- A compelling storyline
 - A plotline is narrated and delivered through multiple communication channels, including Web pages, email messages, phone calls, and print-based mailings.
- Collaborative game play
 - Players construct their own means of interacting through Web-based discussion boards, email messages, and real-world gatherings.
- i.e shared scenarios
 - through which gamers interact and collaborate
 - Enjoyment depends on the kind of shared experience
- The gamers' sustained, active, and voluntary participation is the most important condition of the ARG experience!
- Timing is a key
 - Designers must react immediately to maintain the game's appeal



ARGs

- Design Team with three main responsibilities:
 - Storyteller
 - 3 storywriters
 - Community lead
 - Round-the-clock monitoring of players
 - makes a daily report to the design team
 - Technology support and sound effects
 - Web-page design, site security, maintenance
 - Audio-file producers
 - Voice-actors



ARGs

- Gamers
 - Have to **assemble the story** from various story fragments delivered by ARG designers.
 - Collectively **learn the syntax and meaning** of a special language embedded in the games web arcane enough to give gamers a sense of camaraderie.
- Designers **rely on several channels**
 - Hidden html code, email messages, sound files, images
 - Voice clips sent to payphones
 - Blog maintained by an imaginary character in the game
 - Movies, TV shows, consumer-goods marketing
- Design team used them to blur the boundaries between in-game and out-of-game reality and experience!

Thanks for your
attention!