Vorlesung
Advanced Topics in HCI
(Mensch-Maschine-Interaktion 2)

Ludwig-Maximilians-Universität München

LFE Medieninformatik

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WS2003/2004

http://www.medien.informatik.uni-muenchen.de/

Chapter 3: Mobile HCI

Table of Content

- Input & Output Devices
- Input & Output Techniques
- Guidelines
- Example: Applications for Mobile Phones
- Mobile Gaming
- System Architectures for Mobile UIs

Examples: Tactile Output

- 3D game phones (SCH-G100 and SPH-G1000) with built-in vibration
- Siemens 3D-Ralley car race that vibrates if you leave the track

http://english.chosun.com/w21data/html/news/200504/200504060026.html
http://www.mobile-review.com/review/siemens-sl65-en.shtml

It is expected that Mobile Gaming is becoming a huge market (2)

- “6 November 2003 - Mobile gaming will be key in driving the growth of mobile content and entertainment services, according to a new report from Analysys.”

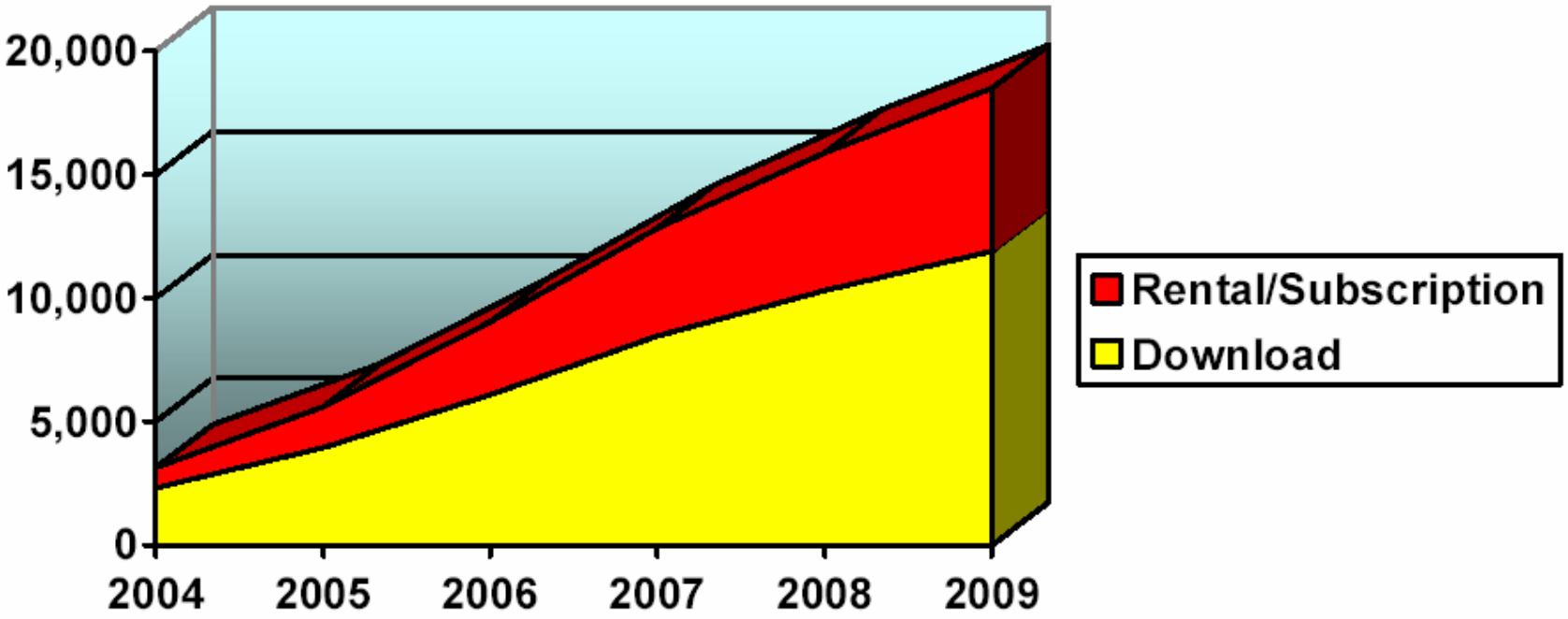
- “Mobile Content and Entertainment Forecasts and Analysis predicts that the total Western European market for mobile games will grow more than tenfold from its 2002 value of EUR0.2 billion to nearly EUR3 billion in 2008 - representing just over 19% of total revenue for mobile content and entertainment services.”

- “Nearly 80% of gaming revenue (EUR2.4 billion) will be derived from downloadable games.”

http://www.analysys.com/default_acl.asp?Mode=article&iLeftArticle=1421&m=&n=

Mobile Games Market Forcast

Figure 1 Total Revenues from Mobile Games ($m), 2004-2009

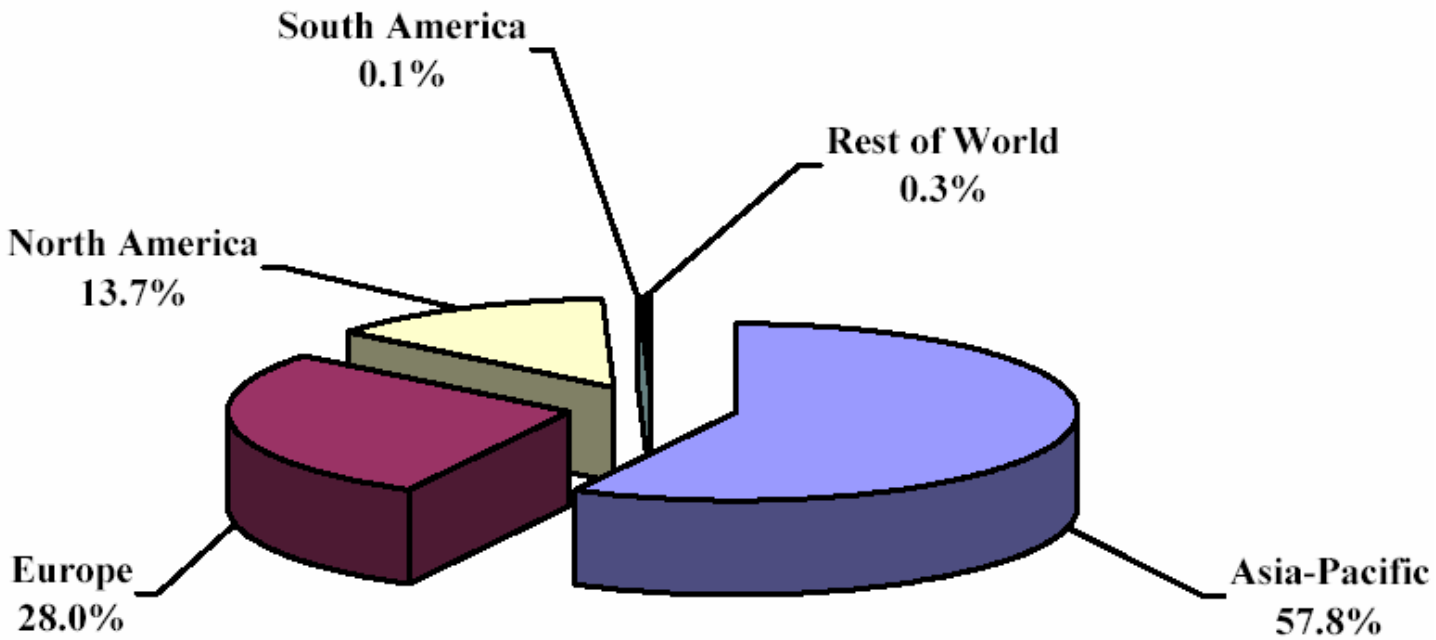


- Jupiter Research
  http://www.juniperresearch.com/

Mobile Games Market

Total Market Value 2004 estimated U$3.1 billion

Figure 2: Mobile Games Market, Revenues by Region, 2004
(Total Market Value: $3.1b)

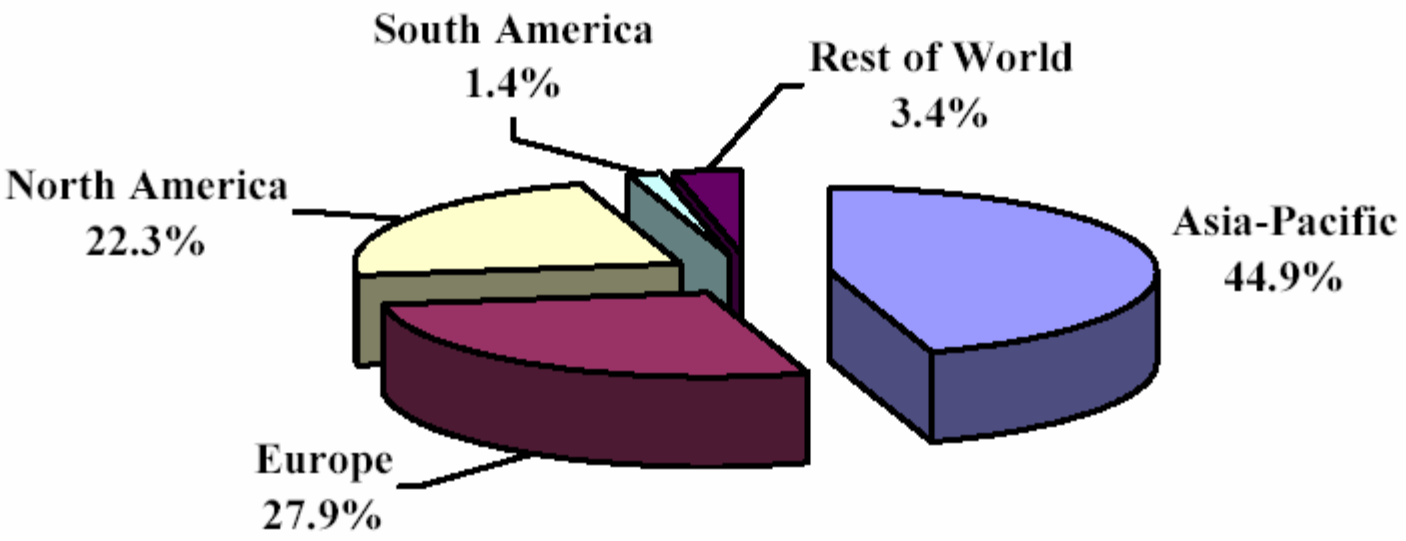


- Jupiter Research
  http://www.juniperresearch.com/

Mobile Games Market

Total Market Value 2009 estimated U$18.5 billion

Figure3: Mobile Games Market, Revenues by Region, 2009
(Total Market Value: $18.5b)



- Jupiter Research
  http://www.juniperresearch.com/

Playable games

- usability of mobile games ≠ usability of a desktop environment
- Main issues
  - fun to play
  - and challenging

- Playability refers to a user's overall experience with a game.

- Playability = the degree to which a game is fun to play, with an emphasis on the interaction style and plot-quality of the game; the quality of gameplay.

Playability is affected by the

- quality of the storyline
- responsiveness
- pace
- usability
- customizability
- control
- intensity of interaction
- Intricacy/complexity/difficulty
- strategy
- the degree of realism
- quality of the graphics and sound.

Usability and Mobile Gaming

- Fun is a main factor game usability
- Mobile games are typically played for brief time periods, so there is no extra time to learn how to navigate inside the game.
- Playing should be as intuitive as possible and the challenge should be in the game play, not in the interaction with the game user interface.
- Usability provides the framework and tools for playability
- The interface is the essential factor a games success
- If usability problems get in the way of intense game playing, the game probably will not be played again.

From: Tip Of The Month: Usability And Fun – Best Friends In Mobile Games (Nokia Forum)

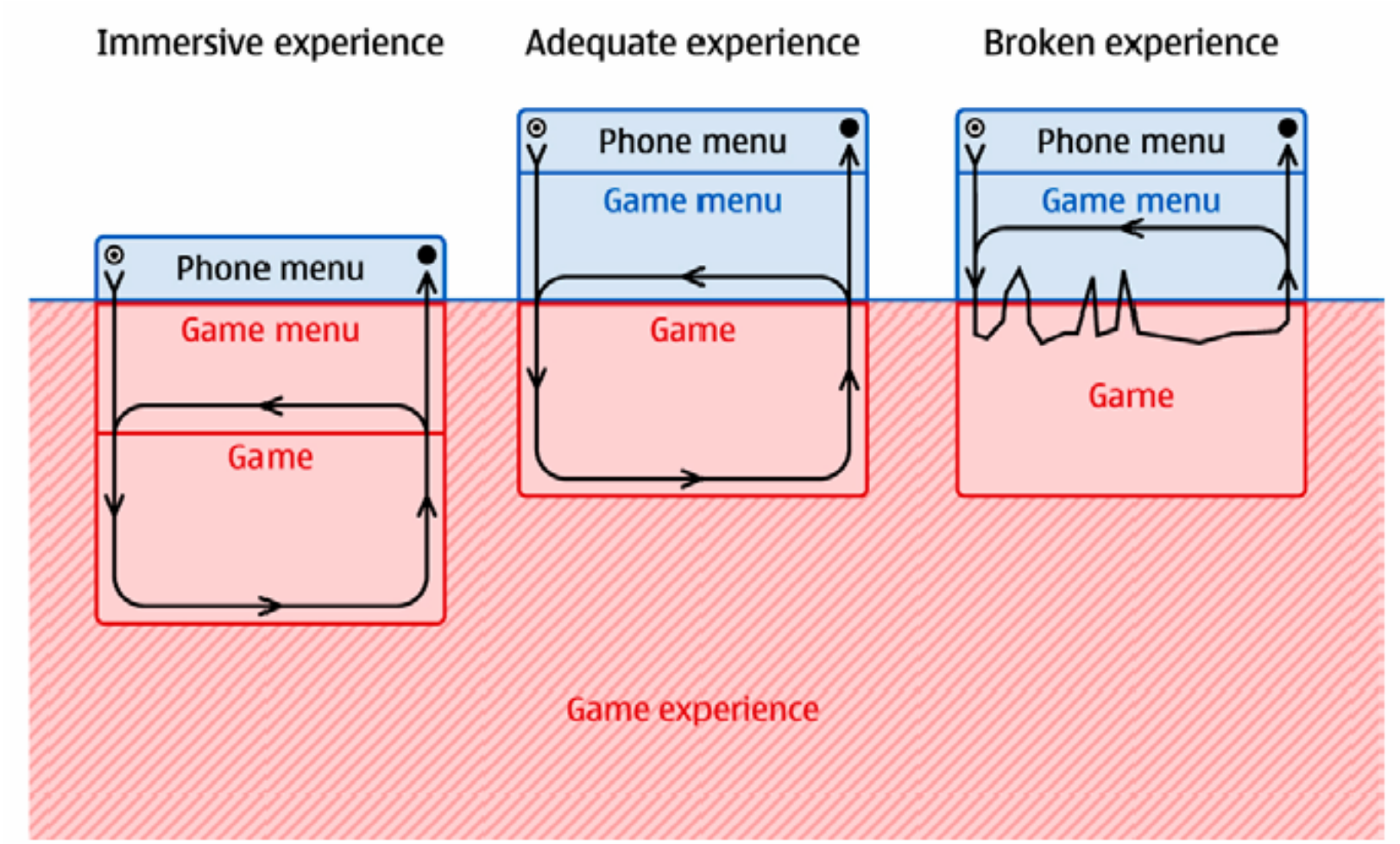
Basic design Issues for Games

- When playing a game, users should experience the game world
- the game navigation structure should support the experience
- Use of high-level UI components should be avoided
- Game menus should look and feel like the game.

- Mobile games are played in a context where interruptions often occur:
  - somebody might call or send an SMS message,
  - the player might need to pause the game to buy a bus ticket.
  - Therefore, the game design should support saving and pausing.

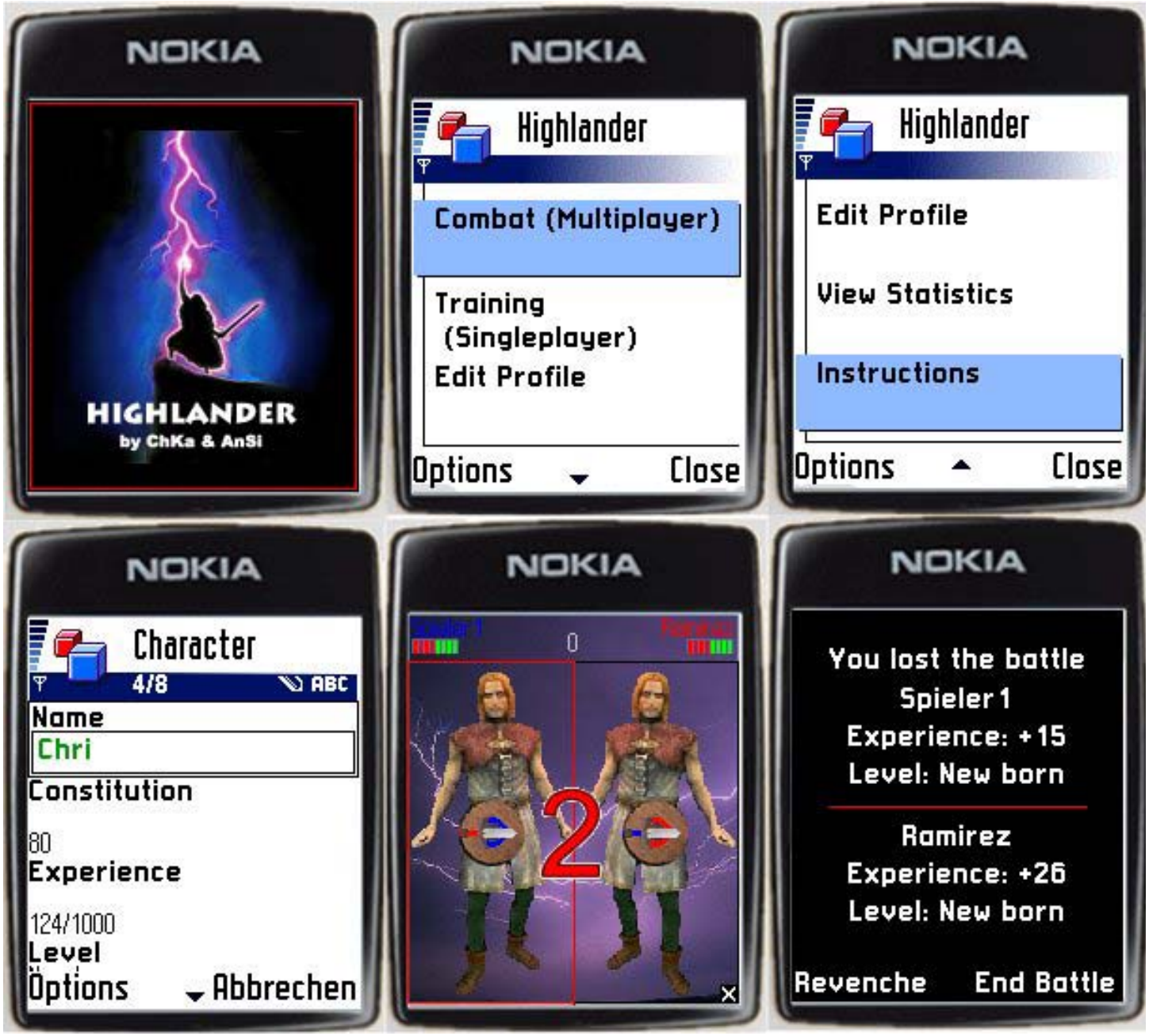
From: Tip Of The Month: Usability And Fun – Best Friends In Mobile Games (Nokia Forum)

Experience



From: Tip Of The Month: Usability And Fun – Best Friends In Mobile Games (Nokia Forum)

- Example
- Game vs. Menus



Principles

- Real world analogies
  - The user has expectations of how his/her surrounding environment works.
  - The game world should match that model.
  - Movement and moving objects in the game world should be intuitive, and obstacles and possibilities should be easy to detect.
  - For example, when characters are jumping or throwing objects, the flight path should be predictable.

- Match functionality and outlook. Things should do what they seem like they are supposed to do

- Do not force the player to learn new things if s/he can utilize his/her prior knowledge. Implement a realistic physics model.

From: Tip Of The Month: Usability And Fun – Best Friends In Mobile Games (Nokia Forum)

Types of Gamers – 4 Categories audience for games

- Immersive
  - early adopters
  - spend lot of time
- Entertainment
  - Enthusiastically
  - leisure activity
- Social
  - socialize with other players
  - prefer relatively simple
  - multiplayer games.
- Passive
  - play games from time to time
  - often to while away otherwise boring moments
  - to kill time

From: Series 40 Game Usability Study (Nokia Forum)

10 Usability Recommendations for Games

1. **Provide a Clear Menu Structure**
   Use only one main menu, accessible with the left soft key. Keep the menu short. In general, use the left soft key for OK, select, and menu; use the right soft key for cancel and back.
2. **Simplicity Is Key**
   If two solutions are equally valid, use the simpler. Make sure each entity in the game is unique, and not easily confused with any other. Provide different game modes only if they are truly different and valuable.
3. **Provide Help When Needed**
   Keep help text short. If feasible, scroll text one screen at a time, not one line at a time. Display short text on the screen to explain new items, characters, and situations in the game. Provide a setting to disable in-game help. Provide a graphic representation of which keys are used for which functions. Do not expect players to read help text or force them to do so.
4. **Be Relentlessly Consistent**
   Use the mother tongue of the user. Be consistent with the phone's UI, with game industry conventions, and within the game itself. Use the left soft key for OK, select, and menu; use the right soft key for cancel and back.
5. **Don't Waste the User's Time**
   Allow her to skip the introduction. Do not require re-entry of data. Provide shortcuts and reasonable default values.

From: Series 40 Game Usability Study (Nokia Forum)

10 Usability Recommendations for Games

6. **Use Natural Controls**
   Use the 2, 4, 6, and 8 keys for horizontal and vertical movement as well as the arrow keys; use the 1, 3, 7, and 9 keys for diagonal movement, if enabled. Use the 5 key as the action button. Design the game so that it does not lure the user into pressing two keys at once, since many mobile devices (and all Series 40 devices) do not support simultaneous keypresses.
7. **Enable Save and Pause**
   Provide a simple save-game feature. Have the game auto-save when the user presses the red phone button - use the destroyApp() method to do this. Provide a pause mode (left soft key, which goes to the game menu); this can be done using the hideNotify() method. If the user quits the game from the pause mode, have the game auto-save.
8. **Conform to Real-World Expectations**
   For example, when jumping or throwing objects, the flight path should be predictable. There must be no invisible barriers that the player cannot pass or holes that he cannot reach. Do not end the game arbitrarily. Implement a realistic physics model if relevant (for example, racing games).
9. **Go Easy on the Sound**
   Provide sound for feedback, but ensure that the game is playable with the sound off, and provide an easy way to turn sound off within the game. No annoying sounds: not too loud, not too high-pitched. Avoid background music, if possible.
10. **Implement a High Scores List**
    Tell the user what score he reached before asking for a name; provide the previously entered name as the default. Do not force the user to enter a name; make it optional

From: Series 40 Game Usability Study (Nokia Forum)

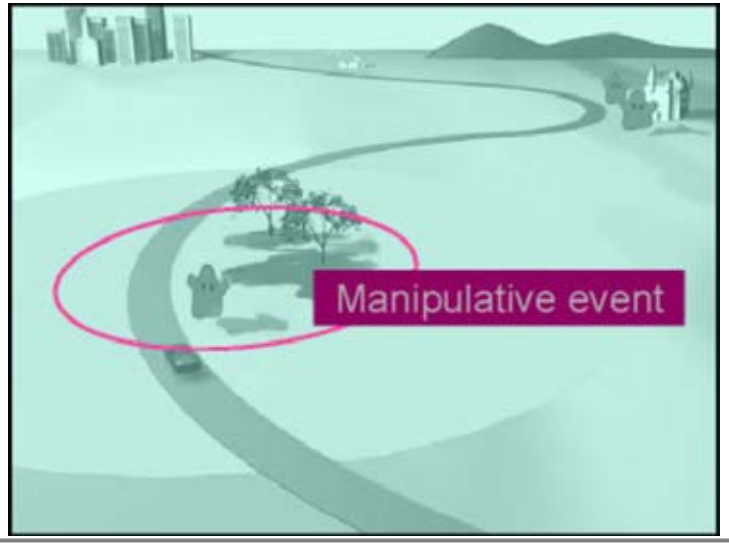
Context as Input for Games (These project)

- Provide a API for game developers
- Use technology in a phone or PDA to get context
  - Camera
  - Location
  - Microphone
  - Bluetooth
- Make it easy to create games that require actions in the real world, e.g..
  - The next level can only be reached if you are alone
  - You get extra ammunition / health when you meet someone (in the real world) you have met before
  - A hint is only offered when you are at a place you have never been before

ContextSnake

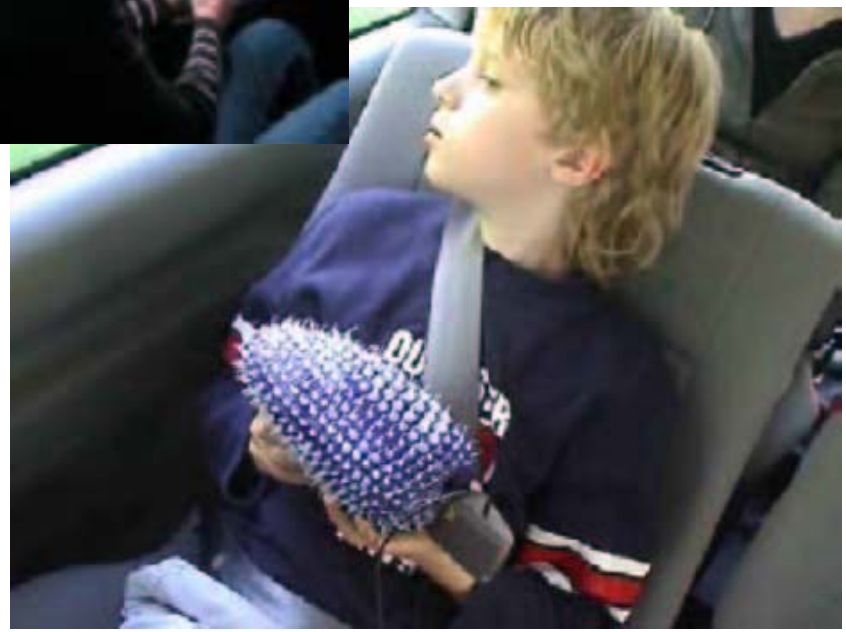
- Projektarbeit, Nora Zelhofer
- Interactive Insitute in Göteborg and LMU München
- Virtual Pets on phones
- Basic ideas
  - Environment in the game changes with the users real environment
  - Offsprings interaction
  - Pet sharing

Example of a mobile location aware game (Interactive Institute, Sweden)



- Backseat Gamming
  http://www.medien.informatik.uni-muenchen.de/en/events/pi03/proceeding.htm

Example of a mobile location aware game (Interactive Institute, Sweden)



Problems with real world gaming

- Law of the physical world are not forgiving!
- Action required in the game may be different from actions appropriate in the real world
- Real world resources may become thing to fight for

See: http://culturalpolicy.uchicago.edu/conf2001/papers/meyers.html

Mobile/Mixed reality Game in Action

Video: **Can You See Me Now?**

Matt Adams, Ju Row Farr, Nick Tandavanitj
Blast Theory
Unit 43a Regent Studios8 Andrews Road London

Steve Benford, Martin Flintham, Adam Drozd, Rob Anastasi
The Mixed Reality Laboratory School of Computer Science and IT
The University of Nottingham

(8 min)