User Profiling; User Requirements

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What worried me

The Winterschool program:

- Keynote: From Meta-Principles To Design Practices: Where Worthwhile Iteraction Designs Come from and How to Get There
- Experimental Research
- User Experience Sampling
- User Modelling / The Dynamics of Experience
- Keynote: Interfaces and Human Perception
- ….

Many opportunities to have overlapping contents.

My solution

- Example based presentation
- Many examples of research in our group
- Focus on techniques for gathering user requirements and for user profiling
- In a new context: changing HCI environments

Overview presentation

- Context: change of HCI
- Methods summed up
- Examples of research projects
- Summary
- Conclusion

Context: HCI is changing

Changes in nature of applications

– Task-oriented	Experience oriented
– Performance	User experience
Effectiveness, efficiency, satisfaction	UX factors: beauty, fun, surprise, intimacy

Context: HCI is changing (continued)

Changes in nature of input/output

- Multi-modal interaction: Speech, gestures, affect, context

Natural intuitive interaction

- Sensors everywhere
- Sensors move to the background

Implicit interaction

Human Computer Interaction becomes
Human Environment Interaction

Sensors and Intelligence

- For localization
- To detect actions, identity, facial expressions
- Interpretation in context (environment, other users, communication processes, devices)
  - User's intentions
  - Motives
  - Emotions
  - Affective state
  - Mental state

Implications for interaction design

- Context/user awareness: the computer is aware of the situation and of what the user does
  - Adapt behavior
  - Support interaction (e.g.give cues when to talk or not talk)
  - Improve user experience
- Responsive systems
  Adaptive, context-aware systems
  Both reactive and pro-active

Methods for user requirements elicitation

- Surveys and questionnaires
- Interviews
- Focus groups
- Observation
- Think aloud,

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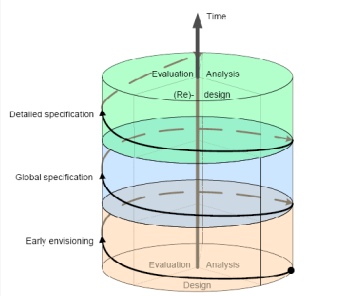
User-centered Design Process



Iterative process

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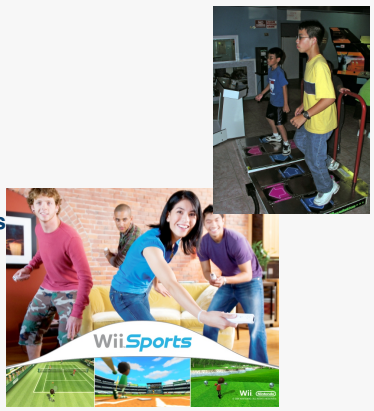
Movement-based Games



Body Movement in the Gaming Experience

- Systematic research on how to build movement-based games for richer and better experiences
- First question: How do gamers experience body movements when playing games and how do they move?
- Marco Pasch and Nadia Berthouze at University College London

Exploratory study

Literature Review

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Interview Study

↓

Movement Analysis Study

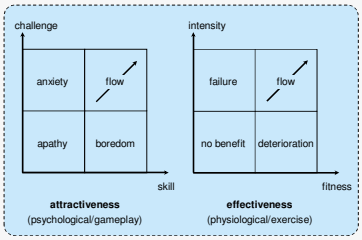
↓

Conclusions

Literature study

Dual Flow Model

Sinclair et al. (2008)



Immersion

I

Interview study

Aim:

How do gamers experience, conceptualize, and interpret their movements when playing movement-based video games?

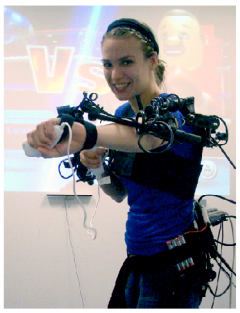
Approach:

- 4 experienced gamers
- Gaming session to prime gamers (+observation)
- Interviews
- Qualitative Analysis

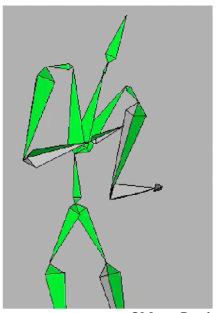
Movement Analysis

- Approach:
  - Collection of Motion Capture Data (Search for movement patterns)
  - Questionnaires on Motivation, Personality & Immersion (Identify correlations to movement patterns)

Body Movement in the Gaming Experience



Participant in Gypsy 6 Motion Capture Suit



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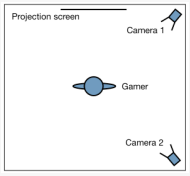
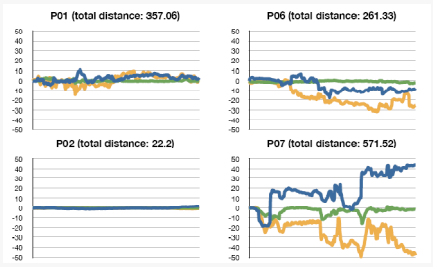
Output Motion Capture Data on Human Model

University of Twente
Enschede - The Netherlands
Human Media Interaction

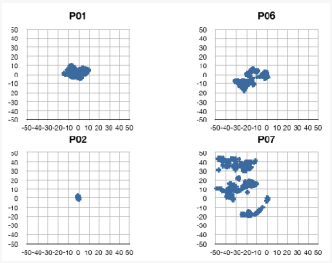
Video recordings



Movement of the body core in each dimension



Movement of the body core top view



X-Axis:forward/backward movement
Y-Axis: lateral movement

A few conclusions

- Gamers approach movement-based games with differing motivations and resp. strategies. These result in measurable movement patterns
- Movement-related factors identified that potentially influence immersion
- More research needed on link between physical activity and gaming experience

Musical Multimodal Child Computer Interaction

Stimulation preschoolers musical expression

The prototype system

- Virtual kangaroo Panze on TV screen
- Panze sings and dances
- Tangibles and kangaroo shaped doll (for choosing songs and instruments)
- Movement Analysis
- Sound Analysis

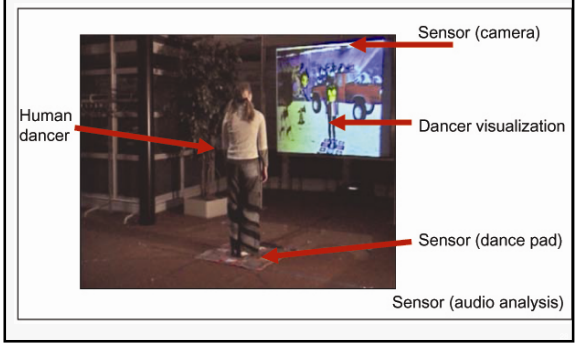
Methods

- Literature study
  - Abilities young children
  - Music education
  - Interaction design for children
- Observation Music on the Lap course
- Prototype system
  - Wizard of Oz study
  - Observations

Results

- Observational study with very young children is difficult
  - Many children were afraid
  - Though some children liked it

Virtual Dancer



Virtual conductor

AMIDA project: Augmented Multi-party Interaction for Distant Access

- Meeting support
- Remote participation support

- Automatic speech recognition
- Computer vision (gestures, pose)

Instrumented meeting room

Interaction modeling, interpretation

- Affect & emotion recognition (hotspots)
- Recognize decisions (full agreement?)
- Focus of Attention; who is addressed?
- Keyword spotting; topic detection
- Summarization; meeting minutes
- Turn taking; back channeling

Methods for user requirements elicitation

- Literature study
- Focus groups
  - Early prototypes
  - Scenarios
- Video analysis
  - Annotations
  - Interpretation

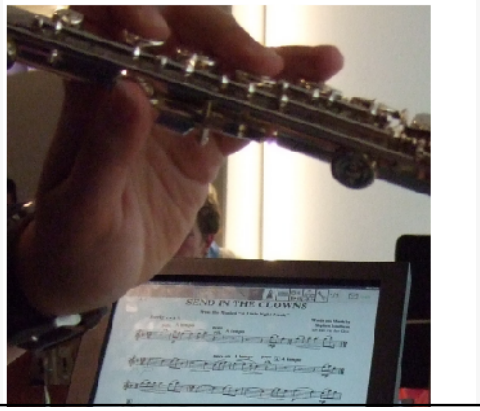
Scenarios and demonstrations

- Remote participation
- Catching up
- Low involvement participation (e.g.expert)

- Content linking demo (pro-active)
- User Engagement and Floor Control demo

MusicReader

Orchestra management and communication system



Methods

- Scenarios for user requirement elicitation
- Menu designs (location, buttons, icons, structure) with musicians:
  - Questionnaires
  - Paper prototypes
- Trial rehearsals and performance
  - Observation
  - Questionnaire

BioRange project

- Domain: Bioinformatics
- Multidisciplinary research teams
  - Biologists
  - Bioinformaticians
  - Statisticians
  - Microarray experts
- Our aim:

  How can such teams interact successfully?

The e-BioLab

- Tool *for* research at UvA: MAD/IBU
- Subject *of* research for us
- E.g., large display interaction:
  - Not obvious how to manipulate
  - Lots of data visible simultaneously
  - Participants may become confused

Figure 2: Scientists interacting with microarray visualisations using multiple displays in e-BioLab MicroArray Department/Integrative Bioinformatics Unit, University of Amsterdam.

Situational awareness

- e-BioLab may become confusing:
  - Lots of things to see and hear:
    - Experts in other fields
    - Visual information on displays, ...
  - Lots of things to do:
    - Computational procedures
    - Discuss course of actions, …

Situational awareness

- Goal: make life easier by
  - Focus-of-attention support
  - Chain-of-thoughts support
- So: understand tasks and users
- Interviews and observations
- Experimental designs

Summary

- User experience (UX) is increasingly important in HCI
- Interaction becomes more natural and implicit (disappearing computer)
- Use mixed methods (both qualitative and quantitative) for gathering user requirements and for user profiling

Conclusion

- Use process data and UX factors (emotion, affect, fun, surprise)
  - For modelling user behaviour
  - For gathering user requirements
  - To improve interaction dynamically
  - To evaluate interaction