Designing Novel Applications for Emerging Multimedia Technology

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Overview

- Centre introduction
- What I do - Interaction Design for Novel Technologies
- Two examples of my design:
  - Interactive TV .............. 15 min
  - LifeLogging ................. 10 min
- Challenges & Design Issues .... 15 min
- Conclusion
Example 1: Interactive TV for Multimedia

Multimedia Techniques

- Shot Boundary Detection
- Scene Detection and Classification
- News Story Segmentation
- Sports Summarisation
- Content-based Searching
- Meta-data augmentation by crawling the Web
- Video Recommendation

+ Network and Storage on the TV set
Characteristics of TV Interaction

- Lean-back (as opposed to Lean-forward)
- Multiple levels of viewer attention
- Use of remote control (as opposed to Mouse/Keyboard)
- Divided attention between playback and interactive elements

=> Design Implications!

Solution – Combination of:

- Overlay & semi-transparency
  - Supporting passive & active viewing
- Multiple levels of interface sophistication
  - Simple interaction while supporting sophisticated features
- Colour buttons for flat (shallow) menu access
  - No deep navigation with remote
- Genre-dependent presentation
  - One button action resulting in variety of presentation depending on the context of watching
- Query without text input
  - Shift interaction burden from the viewer to the system
Example 2:
LifeLogging with SenseCam
SenseCam: What is it?

- **Wearable digital camera**
  with sensors:
  - Light sensor
  - Passive infra-red sensor
  - Accelerometer (X-Y-Z axes)
  - Ambient thermometer

- **Sensor status triggers**
  automatic photo capture: 
  “Passive Capture”

What does it generate?

- **About 2,000 - 3,500 photos** on an average day
Automatic Photo Processing

- To structure images automatically, using content-based Multimedia techniques...

A day’s SenseCam images (2,000 – 3,500)

Event Detection

- Finishing work in the lab
- At the bus stop
- Chatting at Skylon Hotel lobby
- Moving to a room
- Tea time
- On the way back home

Importance Calculation

- 0.08
- 0.02
- 0.82
- 0.04
- 0.1
- 0.15

Keyframe Selection
Interaction Design for Multimedia: Challenge

- Often no “typical users” available: new breed of automatic multimedia indexing systems not yet currently in use
  - Establishing user requirements & needs problematic
  - User testing problematic
  => So I tend to depend heavily on general principles & my own “instinct”
No existing user base for the new multimedia technologies
1. Lengthier initial design time

Reproduced from: Zimmerman J, Forlizzi J and Evenson S. Research through design as a method for interaction design research in HCI, CHI 2007 Proceedings
Design took appx. Near full-time 4 months  
(April - July 2004)

Design took total 5 months (February – June 2007), involving:
- 3 Major re-design
- 3 Brainstorming & whiteboarding with all involved
- 8 Brainstorming with a 3-person design team
- Total 11 iterative refinements
My office wall (as of 2 May 2010)
Engineers

New scenarios, opportunities
Technology

No existing user base for the new multimedia technologies
1. Lengthier initial design time
2. Create a user base...

Anthropologists

Behavioral Scientists

Models
Theories
Unanticipated effects
Theory/model gaps

Interaction Designer

Research artefacts (prototypes)

HCI Practitioners

HCI Practitioners

HCI Practitioners

HCI Practitioners

HCI Practitioners

HCI Research Community

HCI Practice Community

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No existing user base for the new multimedia technologies
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2. Create a user base...

Working with School of Communications:
• Deployed for students (>260) in film study class 2008
• Monitored the usage for the whole semester
• Interaction logging
• Interview, questionnaire...

Interaction Design for Multimedia: Challenge

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- Deployment effort to monitor how people use such novel applications

Conclusion

- Design for Novel Applications
  - Come up with novel application scenarios
  - Design interaction strategies
  - Design concrete user-interfaces
- Design consultancy within the group... loved & hated
- “Educating” our members on Design and Usability
- Help our group envisage the future usage of the developing technologies

Thank you