Interactive Television & Online Video

Course: Current Topics in Media Computing and Human-Computer Interaction
Lecturer: Christian Corsten, M.Sc.

Watching Television in the 1950s

Interactive TV in the 1950s

http://www.youtube.com/watch?v=u5TdRhNLOPk

Watching TV Today

on-demand
personal screens
interaction
individual content
Interactive TV in the 1950s

http://www.youtube.com/watch?v=uSTdRhNLOPk

From TV to Interactive TV (iTV)

1. Conventional TV
   Watching

2. Enhanced TV
   Teletext

3. Personalized TV
   Recordings,
   Content navigation

4. Interactive TV
   Return Channel
Online Video
Individual Choice
User Participation
A Power Shift?

Trends in iTV: Social TV
Trends in iTV: Social TV

Trends in iTV: 2nd Screen Apps
**Trends in iTV: 2nd Screen Apps**

- Used at home or in the evening, often with others present
- Slightly more than TV content, often as one device for multiple activities
- More likely to choose if another device is present
- More likely to choose if another device is present
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- More likely to choose if another device is present

**Cross-Screen Engagement**

**Television: The Everyman**
Nokia, our most established screen, has fully grown into “The Everyman,” the most popular device for multi-screening behavior. It appears that spontaneous and impulsive viewers are more likely to engage in cross-platform engagement, providing emotional transcendence on that activity while avoiding latest, but more engaging activity on the partner screen, such as the tablet.

“Something about a giant TV makes you feel less lonely. I’m a student living alone, and having the TV on as background noise as I’m folding laundry or doing other mental tasks makes me feel less like a crazy cat lady.”

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(Survey by Microsoft, 2013)
Cross-Screen Engagement

Television: The Everyman

Television, our most established screen, has fully grown into “The Everyman”. It is the most popular device for multi-screening behavior. TV delivers passive entertainment, enjoyment, familiarity and comfort. It is best positioned to provide emotional brand experiences that are intuitive and easy to understand, but more and more consumers are using a second device while watching television, often out of 20 consumers use a second device while watching TV in the US and lastly find the purist “everyman” and “jester” performance, simply providing some entertainment and little else.

“Something about a giant TV makes you feel less lonely. I’m a student living alone, and having the TV on as background noise as I’m folding laundry or doing other menial tasks makes me feel less like a crazy cat lady.”

— Nicolette, US

(Survey by Microsoft, 2013)
iTV on the 1st Screen

- Multimedia Home Platform
  - First specification: 2000
- Interactive Java applications
- Backchannel support
- Home shopping, interactive quizzes, information retrieval
- Discontinued in Germany

Hybrid Broadcast
- Broadband TV
- "Red button"
- HTML5-based
- Better graphics
- Catch-up services
  - Polls
- High definition video text

DEMO | arte +7 HbbTV Portal
iTV on the 1st Screen

Various broadcasters, various applications

How to interact?

navigate, select

How to ensure consistency?

Design Patterns for iTV Applications

Pattern Language (42 patterns):

A. Page Layout
B. Navigation
C. Remote Control Keys
D. Basic Functions
E. Content Presentation
F. User Participation
G. Text Input
H. Help
I. Accessibility & Personalization
J. Specific User Groups

In-Class Exercise

Pattern G1: Multiple Ways to Input Text

Task: Roughly sketch

- Examples
- Problem
- Solution
- Evidence

for this pattern!
TNT – A Numeric Keypad Based Text Input Method

Ingmarsson et al., CHI 2004

Industry Demands

• Conformity to standards, legacy
• Advertisement is important (e.g., CI+ standard: no ad skipping)
• Broadcaster dependency
• Interactivity vs. attention
• Creeping featurism sells better (e.g., “Smart” TVs with a browser)

In-class exercise:
How about research?

Selected Research Papers from TVX 2014

• ACM SIGCHI conference
• Former EuroITV conference
• 2014: 140 attendees, 20 papers
• Industry track

Who are the users?

iTV consumers (i.e., viewers)
iTV producers (e.g., content editing)
Input Devices for iTV (1)


RQ1: How does the performance of older and younger adults differ when controlling iTV applications with different input modalities?

RQ2: Is there a difference in the UX of older and younger adults when using different input modalities, in terms of usability, effectiveness, satisfaction, and efficiency?


• Usability, effectiveness, satisfaction, efficiency: G rated lower than T, R (sig.)
• Mirrored T works best
• G were not accurate and robust
• R works well for linear tasks

Input Devices for iTV (2)

Vatavu et al.: Leap Gestures for TV: Insights from an Elicitation Study, TVX 2014

RQ: What are users’ preferences for interacting with iTV using free-hand gestures?

• Based on elicitation study (*)
• 18 participants
• TV + Leap Motion Controller
• 21 referents (effect of a gesture) based on 4 categories: Basic, generic, channel, feature
• Task: perform a gesture for a referent (show as text)

(*) Reading Assignment
Wobbrock et al.: Maximizing the Guessability of Symbolic Input, CHI ’05

Figure 3: Task completion times for all experimental conditions. Error bars show 95% CI.

Figure 4: Interaction graph for Interaction Modality x Age (left), Interaction Modality x Application (middle) and Application x Age (right).
Vatavu et al.: Leap Gestures for TV: Insights from an Elicitation Study, TVX 2014

Gesture set
- Look at the paper! (appendix)
- Based on highest agreement
- Goal: inspire designers

<table>
<thead>
<tr>
<th>Gesture</th>
<th>Correctly recalled</th>
<th>False Positive</th>
<th>Forgotten</th>
</tr>
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<td>20%</td>
<td>20%</td>
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<td>10%</td>
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</tr>
<tr>
<td>remote</td>
<td>0%</td>
<td>0%</td>
<td>100%</td>
</tr>
</tbody>
</table>

Design implications (selected)
1. Finger and hand pose gestures are preferred to remotes, but there is low agreement between users.
2. Users fall back on previously acquired gesture interaction models.
3. Preference for 2-D gestures.
4. Users prefer either motion or hand pose gestures, and combinations of these two are less likely.
9. Users show preference for drawing letters in mid-air to execute tasks whose names start with those letters.

Geerts et al.: In Front of and Behind the Second Screen: Viewer and Producer Perspectives on a Companion App, TVX 2014

- RQ: How to design companion apps?
- How? Interviews with professionals, recordings at home, analytics on 2nd screen app usage
- Criteria:
  - Ease of use
  - Timing
  - Social interaction
  - Attention
  - Added value

Designing 2nd Screen Apps
- Ease of use
  - No accounts!
  - Single app per broadcaster!
- Social interaction
  - App is catalyst for conversation (e.g., polls)
  - Use app as personal remote, promote results on 1st screen
- Timing
  - Live viewing
    - Text messages
    - Polls
    - Broadcasters sync by hand
  - Delayed viewing
    - App not in sync, unusable
    - But: recordings more important than app
Designing 2nd Screen Apps

Geerts et al.: In Front of and Behind the Second Screen: Viewer and Producer Perspectives on a Companion App. TVX 2014

- **Usage**
  - Users look back at info updates
  - Provide update history!
  - App mostly used only when show is being aired
    - Against broadcasters interests

- **Attention**
  - Use timer to indicate when next update is due!
  - Users expect updates on certain events (e.g., actors text messaging)
  - If no updates for a while: users will switch to other apps
  - If an update contains too much content: not consumed, content might be missed

- **Added value**
  - Character quotes: only funny quotes
  - Polls: answer must not be obvious
  - Diegetic content (e.g., text messages, newspaper articles, pictures)
    - very much appreciated because it's additional content
  - Non-diegetic content (meta information)
    - appreciated but must be concise/short

  - Broadcasters fear distraction from 1st screen
    - Challenge: right balance between engagement and distraction
  - Producers fear effort of designing 2nd screen app does not pay off

- **Evaluation**

  **What to evaluate?**
  - **Usability**
    - Is the system/application easy to use?
  - **Sociability**
    - Is the social interaction supported well?
  - Sociability testing requires good usability
  - Do not combine usability and sociability testing!
Evaluation

What’s different for TV?

- Physical characteristics of interaction
- Social characteristics
- Time-related aspects
- Broadcast-related aspects
- Watching TV is optional/additional task

Pemberton et al., HCI International 2003

Evaluation

Users

- Single vs. group interaction
- For groups: users must know each other!

Content

- Must match the users’ preferences!
- Genres must be sociable
- Pre-recorded: content might be known
- Live: difficult to control

Evaluation

Where?

- In the field (~ at home)
  - Natural environment
  - Suitable for long-term studies
  - Technical set up complexity
  - Observation difficult
    - Diary studies, logs, video recordings (?)
- In the lab
  - More or less the opposite of in the field

WHAT’S NEXT? | Beyond a limited, flat screen?
Conclusion & Take-Aways

TV is not dead.
(Live) TV is a social event.
Backchannel for interactivity.
From lean-back to lean-forward.
Input beyond a classic remote.
We multi-screen.
Social TV and 2nd screen.
Industry vs. research.
Usability and sociability.
Augmented TV beyond a flat screen.