**Summary on UL progress & Sharing & Navigating Immersive Video**

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**Motivation**

video: great authenticity, realism & emotional impact

360º video captures image all around + immersive experiences

**Motivation**

increasingly users are enjoying capturing, sharing and accessing videos shot from their perspectives & experiences

**Motivation**

hypervideo supports structuring & navigation of video & info

**Summary**

Sharing & Navigating Immersive Video

- Sight Surfers
- Windy Sight Surfers
**Motivation**

Technology to capture 360° video and trajectories more accessible.

**What We Propose: Sight Surfers**

An interactive web application for sharing, visualization & navigation of georeferenced 360° hypervideos & maps.

To empower users in their immersive video experiences in space & time! perceptually + be part of (contribute)

**What We Propose: Sight Surfers**

Users may contribute & surf around, experiencing city or countryside, strolling "in other users' shoes", through crossing trajectories, or even movie scenes as new ways to create and engage in novel forms of entertainment, tourism, culture & even art.

**Challenges**

- 360° video with the feeling of looking around
- Navigate hypervideo effectively in 360° even when out-of-sight address: cognitive load + disorientation
- Navigate videos & maps; based on their location; synchronize; detect crossing trajectories
- different types of videos (formats, user generated, movies...)
- large amounts of videos & users, with filtering for easy access.

**1. Georeferenced 360° Video Capture & View**

Sony Bloggie 360° + mobile Sight Surfers

**360° video camera with a special lens**
2.1 Navigation & Orientation in the 360º Video

- 360º drag interface
- Video view area (pizza-slice)
- Minimap
- Video timeline

2.2 Geographical Navigation & Orientation in the 360º Videos & Maps

- Video trajectory navigation
- Viewed trajectories painted in red over green
- Synch of video & map view area marker
- Map & satellite Google map view

2.3 360º Hypervideo

- Hyperlinks:
  - Points of interest
  - Crossing trajectories (links to video)
  - Movies (or external videos)
  - Websites

2.4 Navigation & Orientation in 360º Hypervideo

- Hotspot on the minimap
- Hotspot indicators
- Memory bar
2.5 360° Hypervideo - example

User Evaluation - method

- features + user experience
- USE: Usefulness, Satisfaction, Ease of use usability problems, comments & suggestions
- tasks, observation, semi-structured interviews

User Evaluation - results

11 participants (4 female, 7 male), 20-39 years old
14 tasks rated 1-5 (in 5) in USE
Global Evaluation:

![Graph showing user evaluation results]

Conclusions

- Very encouraging results
- Users understood & liked the Sight Surfers concept perceived it as very useful, satisfactory & easy to use, and would use it again.
- although still some challenges:
e.g. memory bar not totally understood.

Future Work

- Revise & extend based on encouraging evaluation
- More types & large amount of videos & users (HD ...)
- Filtering & zooming in space & time (in progress)
- More immersive scenarios (in progress)

Thank you!!

Questions

www.di.fc.ul.pt/~tc
Windy Sight Surfers

Sensing and Awareness of 360° Immersive Videos On the Move

Video & Metadata Capture and Publishing in WSS

- Sony Bloggie & GoPro
- Android:
  - Geo-References (Lat-Lng, Speed, Orientation)
  - 3G for OpenWeatherMap weather forecast WebService (Temperature, Weather Status, Rain, Wind Speed & Orientation)
- Users can submit and search.

Video Sensing & Context Awareness in WSS

Experience Sensing Features

- 360° Video "Real" Pan Around
- Arduino Wind Accessory

Video Sensing & Context Awareness in WSS

Experience Sensing Features

Video Sensing & Context Awareness in WSS

Context Awareness Features

Overlay
- Permanent Information
  - Pie-Chart, Speedometer, G-Force Meter
- Momentary Information ➔ Intelligent
  - Visual and Vibratory notices for momentary events ("Max Speed!")
  - Hyperlinks

Searching Videos in WSS

- Bubbles, Paths and Keywords/Filter
When I sit in my couch... the mobile app detects the TV... and everything changes... (2nd screen)

**WSS’ Architecture**

- Wind Surfers TV
- Wind Surfers Mobile
- Video Camera
- Metadata Capture Module
- Front End
- Wind Surfers Mobile Application
- Wind Accessory
- Wind Surfers TV Application
- Server
- Back End
- PostgreSQL, Videos & Files
- Cleanup Handler
- PostgreSQL/PHP
- Submission Handler
- PostgreSQL/PHP
- Internet
- WebServices
- PostgreSQL/PHP

**User Evaluation . method**

- features + user experience
- USE: Usefulness . Satisfaction . Ease of use usability problems . comments & suggestions
- tasks . observation . semi-structured interviews

**User Evaluation . results**

- 21 participants (8 female, 13 male) . 18-57 years old

**Conjunction of the developed features**

- All activated (4.9;4.9;4.9)
- Experience Sensing disabled (4.6;4.3;4.7)
- Context Awareness disabled (4.4;4.5;4.9)
- All disabled (2.7;2.8;4.9)

**Searching Videos in WSS**

**WSS Interaction With Wider Screens**

- Are there differences between the Experience Sensing and Context Awareness feature categories?
  - Four tasks for comparison (still with the same methodology)

- Evaluating Immersion...
  - “Presence is a human reaction to immersion.” [Slater]
  - .......we must evaluate Presence!
  - Immersive Tendencies Questionnaire (ITQ) &
  - Presence Questionnaire (PQ)
User Evaluation . results

<table>
<thead>
<tr>
<th>Subscale</th>
<th>Mean</th>
<th>σ</th>
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<tbody>
<tr>
<td>Tendency to maintain focus on current activities</td>
<td>4.2</td>
<td>1.55</td>
</tr>
<tr>
<td>Tendency to become involved in activities</td>
<td>4.3</td>
<td>1.57</td>
</tr>
<tr>
<td>Tendency to view videos</td>
<td>5.1</td>
<td>1.37</td>
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</table>

ITQ: 1 (small) to 7 (high) degree of immersive tendency

User Evaluation . results

<table>
<thead>
<tr>
<th>Major factor category</th>
<th>Mean</th>
<th>σ</th>
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<tbody>
<tr>
<td>Control factors</td>
<td>6.1</td>
<td>0.86</td>
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<tr>
<td>Sensory factors</td>
<td>6.4</td>
<td>0.72</td>
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<tr>
<td>Distraction factors</td>
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<tr>
<td>Realism factors</td>
<td>5.6</td>
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<tr>
<td>Involvement/Control</td>
<td>6.2</td>
<td>0.86</td>
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<tr>
<td>Natural</td>
<td>6.2</td>
<td>0.76</td>
</tr>
<tr>
<td>Interface quality</td>
<td>6.1</td>
<td>0.86</td>
</tr>
</tbody>
</table>

PQ: 1 (small) to 7 (high) degree of presence

User Evaluation . results

User Evaluation . results

User Evaluation . results

Questions?

Thank you?

Summary on UL Progress (1/4)

since 1st workshop, Nov 2011. Team @ UL: Teresa Chambel

On Augmented iTV & Video in Crossmedia

- Advances in the integration of mobile devices in eITV
- Alcina Prata progress in PhD thesis writing


Summary on UL Progress (2/4)

On Immersive Interactive Video

- Luis Neng finishes MSc thesis (Dec 2011) (developed 360º Hypervideo Player)
- Sight Surfers
- Gonçalo Noronha finishes MSc thesis (Dec 2012)

- Carlos Álvares finishes MSc thesis (Dec 2012)
Summary on UL Progress (3/4)

... On Immersive Interactive Video


• João Ramalho starts MSc thesis (Sep 2012)
• Windy Sight Surfers
  Paper about Windy Sight Surfers (submitted)

Summary on UL Progress (4/4)

With the ImTV Team