Sociality and User Engagement in Tangible, Embedded and Embodied Interactions in Public Spaces

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Bauhaus-Universität Weimar 2015
Our Research at BUW

Tangible, embodied, embedded

Public spaces – urban spaces
  - museums (very different spaces)

Supporting sociality and Engagement
Sociality and Engagement

2 application contexts: Museum installations
Interactive installations in urban space

What kinds of configurations of technology can support interaction in the here-and-now?

What usage scenarios we may come up with, once we understand public spaces as social spaces

Space as 'res publica'
Fostering ‘Shared Encounter’

[…] the interaction between two people or within a group where a sense of performative co-presence is experienced and which is characterized by a mutual recognition of spatial or social proximity (Willis 2010).

[…] a digital encounter is an ephemeral form of communication and interaction augmented by technology (Fatah gen. Schieck 2010).
Sociality and Engagement
Sociality and Engagement

Hornecker & Stifter, 2006
Learning from Interactive Museum Installations. OzCHI’16
New Interaction Modalities

(touch, tangible, gesture, full-body movement, ...)

How does it affect how we interact with the world, with each other?

What new user experiences do they generate?
  - Social interactions
  - Affective aspects of user experience

Interaction with architectural space
Touch, Tangible, Full-Body: Old Interaction Modalities
The Role of Space

Thinking at architectonical scale
Space as Orchestrator

Helpful background theory:

E. Hall: Proxemics Theory

Kendon: F-formations

Space Syntax (Hillier): ‘Space is the Machine’

Marquardt, Hinckley, Greenberg 2012
Rich ecology of social interactions often evolves AROUND the system

Hornecker 2010. Interactions around a contextually embedded system. TEI 2010
Engaging with the City and Engaging with Others
Playable City?

Modern Cities – anonymous, cold

Can public activities, which are fun
- foster identification with your city and social cohesion
- support creative appropriation: this is MY city
- create motivation for participation ?

‘Shared Encounter’ concept
Playfully appropriating the city

Children are good at this!
SMSlingshot

Patrick Tobias Fischer  
(PhD Student) +  
friends: VR.Urban

Fischer and Hornecker,  
ReClaim the Screens
First Version: spread.gun

Typing in message at screen, then shoot with canon -> queuing!

SMSSlingshot: more flexible, guerrilla-like, portable, expressive gesture
• People have time, meet up, want to relax,
• Suited for narrative structures

• Steady flow
• Ad-hoc, short interactions
Potential Interaction Space
Social Interaction Space
3. Social Interaction Spaces
Materiality and Embodiment

- Slingshot metaphor easy to understand
- Bodily experience of Throwing...
- Throwing is expressive, visible – performative act
Playfully appropriating the city
Playfully appropriating the city
Playfully appropriating the city

- Shared encounters: 4%
- Interactions: 12.5%
- Passersby: 85%
- Observers: 2.5%
Kick/Flickable Light Fragments

Different Shapes

Different ‘personalities’ have different reactions
Degrees of engagement

- Finding meaning/ sense making
- Interaction
- Understanding reactions
- Creative play + Inclusion of Environment
Parasitic Interfaces: the PIPE

- Fixed to urban fixtures
- Visibility of lights
- Discoverability

2015
Meiningen - The Theatre-machine
Meiningen - The Theatre-machine

Media-Architecture + HCI at BUW

An interactive façade mapping

Background

Story related to historical context

Gesamtkunstwerk

- Reactive Element
- auto-active ...
- Performative ....
- Interactive ....

Engaging Citizens with THEIR heritage
Castle Elisabethenburg

- 120m curved façade
- central fountain
- one entry tunnel
Circles follow visitors that enter the archway
Façade mapping show about the 12 theatre principles

© Candy Welz
Choreography drawing attention to fountain + machine

© Candy Welz

© Anke von der Heide
The Theatre Machine

aim – multi user interface
- biggest possible interaction space
- non competitive
- intuitive usage

Rope Interface
- 3 parts, 3-5 m length

Early on-site visits
The Theatre Machine

Moving one rope moves one layer on façade
The Theatre Machine

• Accessible:
  – low-tech, observable interaction, playful
• Social interactions & encounters
• Empowering: my movement has a BIG effect
• ‘Content’ is interesting (visually, topically)
• Stages of Engagement – up to creative acts and delight
Supporting Engaged Interaction in Museum Spaces

- What does engagement mean?
  - Hands-on – minds-on
- Role of social interaction
- Museum Experience: Sensory, Cognitive, Emotional, Social
Cultural Visits are Social Occasions

Burns Birthplace Museum
Ayrshire
Social Encounters in the Museum Space

• Investigating what makes good museum installations that engage visitors

• Museums as testbed for understanding what makes interaction engaging and fun, sparks conversation
Early Research: Technical Museum Vienna

Groups vs. solitary usage
Sharing activity
Like being active (not info push)
Creative appropriation & challenge
Tangible Manipulable Resources

Clarke, Hornecker. Social Activities with offline tangibles at an interactive painting exhibit in a children’s cultural centre. Proc. of BritishHCI’15
Developed via Paper Prototypes and Mock-Up

(1) Paper prototype

(2) Mock-up (physical Interaction central)

(3) Final system

By Loraine Clarke, Univ. of Strathclyde
Physical Resources for Planning Activities as a Parallel Process

Bystander activity
Cards a resource for discussion and negotiation
Painter undisturbed – sole control over paintbrush
Distribution in Space enforces Collaboration

Glen Douglas
Steam Engine Installation,
Riverside Transport Museum Glasgow

Distributed controls, distributed displays

Can't be used alone

Clarke, Hornecker. Experience, Engagement and Social Interaction at a Steam Locomotive Multimodal Interactive Museum Exhibit. ACM CHI'13 EA
Risks of de-coupling technology from heritage

“[Only] few educational conversations were observed at the table except for reading aloud”
Eva Hornecker

“I don’t understand it either but it’s cool” – Visitor interactions with a multi-touch table in a museum”
meSch at the Allard Pierson Museum in Amsterdam:

‘The Illusion of Motion in Greek Art’
How can it be that we see movement in and on objects that by definition are unable to move, such as vases and statues?
Tangible and Embodied Interaction

“Strike a Pose”, Gallery One, Cleveland Museum of Art
Crafted tangible, embedded and embodied interactions are evocative, memorable and effective…
…but expensive, time-consuming to realize and not easily portable.

Making this affordable and manageable for heritage institutions -> DIY approach!

• Co-Design with curators and museums
• Enabling curators to develop and author interactive installations
• Based on ‘smart objects’
Concluding Thoughts

• Examples from variety of Activity Areas
  – Museums, Urban installation

• HCI / Interaction Design needs to learn from (urban) sociology, architecture, urbanism, facilitation methods, kindergarten play methods etc.

• Lots of concepts and knowledge out there…
Concluding Thoughts

• What kind of technology do we want to put in public places to make us engage with them and with each other, to make us care

• How can we foster ‘shared encounters’
  – With technology – or with low-tech tech?

• Playfulness strategy just one possibility
Learning about Spatiality

• Spatial configurations of technology and architectural design influence social interaction patterns
  – Is there ‘space' for people?
  – Is there shared focus?
  – Space for companions and observers

• ‘Distributed Activity' (movable system or fixed but large) increases the interaction space
  – more people interact, more space for social encounters

• Thinking at architectonical space level
  – Space influences interactions <-> installations need to fit the space!
The larger Ecology of Interaction

• Rich (social) ecologies of interaction often evolve AROUND the system
  – Even simple systems…
• Needs space (for bodies) and option for activity
• Design for multi-user and for observers, support group dynamics
  – Allow for bystander activity
• Create opportunities for ‘shared encounters’
Interaction Modalities Influence

• Visual access to ongoing activity
  – Easier/harder to join in
  – Effects on joint awareness – how fluid is collaboration, how fixed do roles need to be?

• Tangible and Embodied Interaction
  – Make it accessible, fun, performative, expressive

• Physical interaction can increase performativity
  – Fun to perform
  – Attracts attention (part of the spectacle)
  – Implicitly social control
Interaction

• Discoverability
  – Understand basic principle
  – Input-output mapping

• Levels of engagement
  – Short interaction satisfying, interaction style develops with exposure

• Support sharing and hand-over (e.g. mobile devices)

• Different types of collaboration feasible
Thanks!

Merci Beaucoup!

ICT Call 9: FP7-ICT-2011-9, Grant Agreement 600851.