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THE VARIETIES OF USER EXPERIENCE

BRIDGING EMBODIED METHODOLOGIES FROM SOMATICS AND PERFORMANCE TO HUMAN COMPUTER INTERACTION

by

Thecla Henrietta Helena Maria Schiphorst

A thesis submitted to the University of Plymouth
in partial fulfillment for the degree of

DOCTOR OF PHILOSOPHY

Center for Advanced Inquiry in the Integrative Arts (CAiiA)
School of Computing
Faculty of Technology

September 2009
Dedication

to my mother
Helena Johanna Smeets Schiphorst
your memory lifts my gaze
and fills my heart
THE VARIETIES OF USER EXPERIENCE: BRIDGING EMBODIED METHODOLOGIES FROM SOMATICS AND PERFORMANCE TO HUMAN COMPUTER INTERACTION

Abstract Embodied Interaction continues to gain significance within the field of Human Computer Interaction (HCI). Its growing recognition and value is evidenced in part by a remarkable increase in systems design and publication focusing on various aspects of Embodiment. The enduring need to interact through experience has spawned a variety of interdisciplinary bridging strategies in the hope of gaining deeper understanding of human experience. Along with phenomenology, cognitive science, psychology and the arts, recent interdisciplinary contributions to HCI include the knowledge-rich domains of Somatics and Performance that carry long-standing traditions of embodied practice. The common ground between HCI and the fields of Somatics and Performance is based on the need to understand and model human experience. Yet, Somatics and Performance differ from normative HCI in their epistemological frameworks of embodiment. This is particularly evident in their histories of knowledge construction and representation. The contributions of Somatics and Performance to the history of embodiment are not yet fully understood within HCI. Differing epistemologies and their resulting approaches to experience identify an under-theorized area of research and an opportunity to develop a richer knowledge and practice base. This is examined by comparing theories and practices of embodied experience between HCI and Somatics (Performance) and analyzing influences, values and assumptions underlying epistemological frameworks. The analysis results in a set of design strategies based in embodied practices within Somatics and Performance. The subsequent application of these strategies is examined through a series of interactive art installations that employ embodied interaction as a central expression of technology. Case Studies provide evidence in the form of rigorously documented design processes that illustrate these strategies. This research exemplifies ‘Research through Art’ applied in the context of experience design for tangible, wearable and social interaction.
The Varieties of User Experience: Bridging Embodied Methodologies from Somatics and Performance to Human Computer Interaction

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AUTHOR’S DECLARATION

At no time during the registration for the degree of Doctor of Philosophy has the author been registered for any other University award without prior agreement of the Graduate Committee.

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Relevant seminars, conferences and art exhibitions were regularly attended at which work was presented, papers were published and interactive art was exhibited. Artworks and publication credits are included below.

Artworks Credits

My artwork and artistic practice is highly collaborative and interdisciplinary. A list of detailed contributions and credits to the art-works referenced within this thesis are described below. The artworks whisper, exhale and soft(n) are referenced specifically as case studies in Chapters 5, 6 and 7 of this thesis. The artworks Felt Histories and Bodymaps are used as historical examples of my artistic exploration of the sense of touch in Chapter 7. As an artist, I am indebted to notable collaborators such as Susan Kozel, Kristina Andersen, the whisper[s] research group, V2_Lab, and of course the pre-eminent Merce Cunningham.

(soft") Interactive public art installation, 2005 – 2007

Artist and Creative Concept: Thecla Schiphorst
Artistic Director: Thecla Schiphorst
Original Tactile Interaction Design: Thecla Schiphorst
Supported by V2_Institute for the Unstable Media
Premiere at the Dutch Electronic Arts Festival DEAF07: interact or die, Rotterdam, April 10-29 2007.
Project Dates: September 2005 to April 2007
V2_Lab Manager: Anne Nigten
Project Manager: Siuli Ko Pullan, V2_Lab
Hardware Engineering: Stock, Simon De Bakker, V2_Lab
Software Design: Rui Guerra, Michiel KauwATjoe, V2_Lab
Original Software Design for Tactile Gesture Recognition: Norman Jaffe, Robb Lovell, SFU whispers research group <http://whisper.iat.sfu.ca>
Physical Object Co-Design, Construction: Banana van Mil
Sound Design: Mark Brady
Passepartout Partners: Frank Nack, CWI, Amsterdam; Lora Aroya, TU/E, Eindhoven University of Technology
Funded by: Passepartout Project EU Dutch Consortium in conjunction with Philips Inc, TU/E, CWI, and V2_Institute for the Unstable Media
Photo Credits: Rui Guerra, Simon De Bakker
exhale: breath between bodies, interactive wearable public art exhibition.

Artistic Director: Thecla Schiphorst
Funding: Canarie, Heritage Canada, SFU, Nokia
Project Dates: 2003 – 2005
In collaboration with the whisper[s] research group: <http://whisper.iat.sfu.ca>
Artistic Director, Concept, Systems Design: Thecla Schiphorst
Performance and Dramaturgical Design: Susan Kozel
Project Manager: Sang Mah
Software Engineering: Rob Lovell, Norm Jaffe
Hardware Engineering: Jan Erkuu, Calvin Chow
Fashion Design and Construction: Gretchen Elsner
Sound Design: Mark Brady
Production and Video: Camille Baker
Production Assistants: Alex Mateesco, Malahat Hussein
Web Design: Adam Marston

whisper: wearable body architectures, interactive wearable public art exhibition.

Artistic Director: Thecla Schiphorst
Artistic + Funding Collaboration: Thecla Schiphorst, Susan Kozel
Funding: Daniel Langlois Fondation for the Arts, Canada Council for the Arts, BC Arts Council, V2_Lab, Future Physical
Artistic Concept, Systems Design: Thecla Schiphorst
Artistic Concept, Dramaturgy: Susan Kozel
Interaction Designer: Kristina Andersen
Project Manager: Sang Mah
Software Design + Engineering: Rob Lovell, Norm Jaffe, Andruid Kerne, Stock V2_Lab
Mathematical Visualization: Julie Tolmie
Hardware Engineering: Stock, V2_Lab; Jan Erkuu, Calvin Chow, whisper[s] research group
Garment Design: Thecla Schiphorst, Kristina Andersen
Garment Construction: Kristina Andersen, Maryan Schiphorst
Production and Video: Camille Baker

Felt Histories, Interactive Computer Video Art Installation, 1998-2000

Artist, Concept, and Video Director: Thecla Schiphorst
Funding: Canada Council for the Arts, BC Arts Council
Artistic Concept, Systems Design: Thecla Schiphorst
Software: Ken Gregory, Grant Gregson, Norm Jaffe
Sound Design: Ken Gregory
Hardware Engineering: Carlos Vela-Martinez
Sensor Wall Design: Ken Gregory, Carlos Vela_Martinez
Sensor Wall Construction: Carlos Vela-Martinez
Video Director + Editing: Thecla Schiphorst
Woman in Door: Helena Schiphorst
Production Assistant: Bernadette MacGregor
Documentation Video Editing: Lorna Boschmann
**Bodymaps: artifacts of Touch**, Interactive Video Art Installation, 1995-1997

Artist, Concept and Video Director: Thecla Schiphorst
Funding: Canada Council for the Arts, BC Arts Council
Artistic Concept, Systems Design: Thecla Schiphorst
Software: Ken Gregory, Norm Jaffe, Grant Gregson,
Sound Design: Ken Gregory
Hardware Engineering: Infusion Systems
Table Design: Hanif Jan Mohammed
Table Construction: Ewan McNeil
Video Director and Video Editing: Thecla Schiphorst
Video Performers: Thecla Schiphorst, Nathan Evans
Production Assistant: Bernadette MacGregor
Documentation Video Editing: Lorna Boschmann

**Publications**


**Exhibitions**


Exhibition: <http://www.futurephysical.org/pages/programme/commissions.html> > co-productions > whisper


Exhibition Catalogues

Performances
exhale: breath between bodies: Canada House Pavilion, Winter Olympics, Torino, Italy, Feb 18th 2006. Developed and choreographed 8 dancers for an interactive performance of exhale: breath between bodies to exemplify networked wearable technologies and design innovation, presented during New Media B.C. exposition.

exhale: breath between bodies: FutureFashion, Pisa, Italy, May 20th, 2006. Choreographed, Rehearsed and Developed choreography with 6 dancers for an interactive performance of exhale: breath between bodies. This performance was developed in the context of new interactive fashion that is integrating technology, communication and expressivity through smart textiles, soft circuits and urban design. <http://www.cutecircuit.com/now/futurefashion-catalog/>


Presentations Panels Reviewed


<table>
<thead>
<tr>
<th>Type</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>Workshop</td>
<td><strong>Wearable Computing for Art and Performance</strong>: a workshop in Laban Computer Movement Analysis and Intermedia Performance, University of Illinois at Urbana Champaign, September 3-6 2009</td>
</tr>
<tr>
<td>Lecture</td>
<td>Krannart Centre for the Arts, Invited Lecture Series, University of Illinois at Urbana Champaign, April 2009</td>
</tr>
<tr>
<td>Presentation</td>
<td>HASTAC Conference, April 2009, University of Illinois Champaign</td>
</tr>
<tr>
<td>Presentation</td>
<td>SXSW, South by South-West, March 2009</td>
</tr>
<tr>
<td>Presentation</td>
<td>Dutch Electronic Arts Festival DEAF07, Rotterdam, April 2007.</td>
</tr>
<tr>
<td>Workshop</td>
<td>Dutch Electronic Arts Festival DEAF07, Rotterdam, April 2007.</td>
</tr>
<tr>
<td>Keynote</td>
<td>NTA National Textiles Association, February 2007, South Carolina.</td>
</tr>
<tr>
<td>Presentation</td>
<td>Fleshting Out, V2_, November 22-23 2006, Rotterdam, Amsterdam.</td>
</tr>
<tr>
<td>Lecture</td>
<td>Smart Fabrics Conference, Intertech, March 2006, Miami.</td>
</tr>
<tr>
<td>Presentation</td>
<td>Smart Fabrics Europe, Invited Lecture and Presentation, Dec 2006.</td>
</tr>
<tr>
<td>Presentation</td>
<td>Nokia University Research Collaborations workshop; presentation: move.me project, December 15, 2005, Nokia Vancouver.</td>
</tr>
<tr>
<td>Presentation</td>
<td>Digital Cultures Workshop and Lab, University of Trent at Nottingham, conference presenter, November 27 – December 4, 2005.</td>
</tr>
<tr>
<td>Presentation</td>
<td>Banff, Bodies In Motion Seminar, June 24–27, 2005, research presentation, whisper[s] project.</td>
</tr>
<tr>
<td>Presentation</td>
<td>Canada Japan Culture New Media Days, New Media Exchange, Nagoya Expo, June 4-8, 2005, Japan Canada, Invited to represent Canada New Media Research, sponsored by Heritage Canada.</td>
</tr>
<tr>
<td>Lecture</td>
<td>Venice Biennelle, Dance and Technology Festival, June 2004.</td>
</tr>
<tr>
<td>Panel</td>
<td>e-culture fair, Amsterdam, Wearable Technologies, sensory tools and performance, October 23, 2003, with Thecla Schiphorst (whisper), Joey Ryan, Institute of Sonology, STEIM, Jussi Anglesleva, Media Lab Europe.</td>
</tr>
</tbody>
</table>
Presentation NewForms Festival, July 30, 2003, Conference Roundtable, “whisper: wearable body architectures”.

Presentation Consciousness Reframed, Newport, University of Wales, “Wearing our selves”, July 4-6, 2003.


Presentation Bridges II, The Banff New Media Institute, October 4–6, 2002, Collaboration and Our Bodies.

Artist Talk BEAP, The Biennale of Electronic Arts, Perth University, August 6, 2002.


Panel Siggraph 2002, Extending Interface Practice an ecosystem approach.

Panel Theatre, Gender and Beyond, London, UK, SmartLab, July 7-8, 2002.

Presentation V2-Lab, Seminar, V2- anarchiving conf, Pulp Fashion, July 5, 2002.


Workshop Workshop on Physiological Computing, CHI2002, Minneapolis.

Panel The Uncanny, Experiments in Cyborg Culture: reading the Cyborg, artist’s panel, Vancouver Art Gallery, February 2002.


Presentation 9-11-N2N Networks to Nanosystems: Art, Science and Technology in Times of Crisis, UCLA, UC Santa Cruz, November 2001.

Artist Talk Foundation Lecture Emily Carr Institute of Art and Design, August 2001.


Presentation e-naissance | new configurations Conference, Turino, Italy April 2001.


Reviews


Word Count of Main Body of Thesis: 76,353

Signed

Date September 2009