

Karen Tanenbaum

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Research Areas

interaction design; ubiquitous, tangible and wearable computing; interactive narrative; user research; adaptivity and artificial intelligence; design fiction; digital heritage; steampunk and maker culture

Education

Ph.D. in Interactive Arts and Technology, Simon Fraser University, 2012

Dissertation: *User Perceptions of Adaptivity in Ubiquitous Systems: A Critical Exploration*

M.A. in Linguistics, University of California-San Diego, 2004

Comprehensive paper: *Modeling German Gender*

B.A. with Honors in Philosophy & Celtic Studies, University of Redlands, Johnston Center for Integrative Studies, 2002

Honors Thesis: *Not a Choice but a Condition: Judith Butler on Performing the Subject*

Work Experience

Contractor, Maker Media Inc, 2013-present

- Writer for MAKE: 3 month contract to be the lead contributor for articles on the Maker Faire Bay Area on makezine.com. Writing 3-5 posts a week and engaging with the online community.

Contractor, Intel, 2013-present

- *Dark Magic* Editing: 1 month contract to edit a book on technology for interactive narrative and digital media. I provided deep editing of the book's text, implemented a structural overhaul, and contributed my domain knowledge regarding the book's content.
- Maker Outreach Program Development: 3 month contract to develop a workshop introducing middle-school girls to the tools and ideas of the Maker movement as part of Intel's involvement with the Maker Education Initiative. Involves research of existing programs, connecting with Maker and STEM education groups and resources, and development of curriculum and training materials.

Graduate Intern, Intel Labs, Interaction & Experience Research Group, 2011-2013

As an intern within the Experience Design Lab, I worked on a wide range of projects, including organizing and mounting an art exhibit on design fiction, coordinating Intel's involvement with Maker Faire, conducting research in the field of wearable computing, and participating in explorations of interactive narrative with academic and industry leaders.

Key Accomplishments:

- Performed research and analysis of the current state and future directions of wearable computing
- Designed and built prototypes of wearable interaction experiences
- Participated in interactive narrative exploration and research with industry leaders in Portland's media and technology and academic partners at the Worldbuilding Lab at the University of Southern California
- Coordinated Intel's presence & educational messaging at the Maker Faire Bay Area & Portland Maker Faire
- Organized and had work featured in the design-fiction themed art show *Powered by Fiction*, first presented at the Emerge conference at Arizona State University

Research Assistant, Simon Fraser University, School of Interactive Arts & Technology, 2007-2012

Project: ***The Reading Glove***, 2010-2012

Funding Agencies: Graphics, Animation & New Media-Networks of Centre of Excellence (GRAND NCE): Play and Performance in Game-Based Interfaces (PLAYPR) Project and NSERC Discovery Grant

Project Summary: The Reading Glove is an adaptive, tangible storytelling system consisting of a custom-built wearable RFID reader glove used to interact with a set of tagged objects and a tabletop display. I was the co-lead researcher on this project along with my collaborator Josh Tanenbaum.

Key Accomplishments:

- Designed the glove-based interaction with objects
- Programmed the reasoning engine in JESS (Java Expert System Shell) and Java
- Programmed the tabletop display in Processing and the RFID reader in the glove in Arduino
- Designed the study protocols to answer specific research questions
- Organized and conducted a 30 person user study collecting qualitative and quantitative data
- Performed data analysis, co-authored conference papers, and presented the work at conferences

Project: ***Steampunk Design***, 2011-2012

Funding Agencies: GRAND NCE: PLAYPR Project

Project Summary: This small project looked at the Steampunk movement and considered its relevance as a design strategy for Human-Computer Interaction (HCI) and interaction design. Based on a study of online practices of Steampunk, we explored how, as a design fiction, Steampunk provides an explicit model for how to physically realize an ideological and imagined world through design practice.

Key Accomplishments:

- Undertook online research and analysis on the practice of Steampunk design
- Co-authored a conference paper connecting Steampunk design to current theory and practice in HCI, including design fictions, DIY, and design through appropriation
- Proposed a studio workshop to explore these concepts in a hands-on group setting

Project: ***Futura: The Sustainable Futures Game***, 2009-2010

Funding Agency: GRAND-NCE: Games for Learning and Training (DIGLT) Project

Project Summary: Futura is a multitouch tabletop game that engages game players in the task of planning for sustainable development by exploring the complexities and tradeoffs of land use planning for food, shelter, and energy needs.

Key Accomplishments:

- Drafted early versions of the game design and rules
- Programmed early game mock-ups in Processing
- Participated in troubleshooting and play testing sessions
- Assisted in the demonstration of the 2010 Olympics Celebration Site in Surrey, BC

Project: ***ec(h)o-VUE: ecologies of play, learning & interaction in museums***, 2007-2008

Funding Agency: Canadian Heritage

Project Summary: The ec(h)o-vue project produced Kurio, a museum guide containing an adaptive user model that supports different learning and interaction styles, extensible group play and learning applications, and a handheld, location aware network system. Kurio won the Gold Award in Concept Design at the Northwestern Design Invitational in 2009.

Key Accomplishments:

- Programmed the JESS and Java reasoning engine for running the adaptive learning system
- Coordinated the work done by the other programmers/designers to achieve the desired interaction goals
- Assisted in designing and running user studies evaluating the system at the Surrey Museum
- Performed data analysis, co-authored conference papers & journal articles, and presented at conferences

Project: **Reflective Practice and Complexity in Design**, 2007-2008

Funding Agency: Social Sciences and Humanities Research Council (SSHRC)

Project Summary: This project investigated the idea that everyone is a designer, describing everyday design in the home and exploring an alternate identity for domestic users.

Key Accomplishments:

- Participated in the analysis of the ethnographic data collected by other researchers
- Conducted follow-up interviews with study participants for member checking
- Performed data analysis and co-authored conference papers

Team Leader & Programmer, UIST Student Innovation Competition, 2009

I was the team leader for an entry into the User Interface Software and Technology (UIST) Symposium 2009 Student Innovation Contest, which asked students to come up with a novel application for a pressure-sensitive keyboard developed by Microsoft Research. My team developed a framework for expressive, emotive gestures using the keyboard that used a simplified version of Laban's movement notation system to map keyboard interactions onto a model of affect.

Key Accomplishments:

- Programmed the demo in Processing
- Developed the theoretical framework connecting gestures with emotional states
- Demonstrated the application at UIST 2009 in Victoria, BC

Programmer, Various Projects, 2008-2009

I assisted colleagues at SFU by providing programming support for their projects. I worked in Processing to develop the *Towards Utopia* research project with graduate student Kristine Nielsen. *Towards Utopia* was an educational game system for children aged 8-12, deployed on a tabletop system using the reactIVision fiducial recognition framework and a Phidget RFID reader. I also contributed Python programming for the PATH project by Kate Armstrong, shown at the Akbank Art Centre in Istanbul, Turkey, March 2008. The PATH Project is an art piece that generated text based on physical movements through the city of Montreal.

Key Accomplishments:

- Designed tabletop and tangible interaction for learning
- Programmed in Processing and Python
- Assisted in running user studies at Science World in Vancouver, BC

Senior Linguist, Parity Computing, 2005-2006

Parity is a software development company focusing on unstructured data management and knowledge discovery. I worked on their reference processor project, parsing bibliographic references.

Key Accomplishments:

- Developed a rule-based grammar system for parsing and tagging bibliographic references
- Developed and implemented strategies to reach specified goals of recall and precision
- Trained and oversaw the work of junior team members
- Coordinated and oversaw development and testing work by a branch of the company in India

Graduate Student Researcher, University of California-San Diego, Department of Linguistics, 2004

I worked with Professor Andy Kehler in the development of a statistical machine learning program for pronoun resolution. I wrote algorithms to identify text patterns and analyzed the results.

Key Accomplishments:

- Programmed text parsing scripts in Python to identify linguistic characteristics of noun phrases
- Developed and implemented strategies to reduce script errors and improve performance

Publications

Journal Articles

- Karen Tanenbaum, Marek Hatala, Josh Tanenbaum, Ron Wakkary, & Alissa N. Antle (Forthcoming). Adaptivity in a Tangible Storytelling System: A Case Study. *User Modeling and User-Adapted Interaction*.
- Josh Tanenbaum, Karen Tanenbaum and Jim Bizzocchi (2010) Getting Your Hands on Electronic Literature: Exploring Tactile Fictions with the Reading Glove. *The International Digital Media and Arts Association (iDMAA) Journal*, Vol. 8, No. 2, pp. 46-57.
- Karen Tanenbaum and Josh Tanenbaum (2010) Agency as Commitment to Meaning: Communicative Competence in Games. *Digital Creativity*, Vol. 21 No. 1, 2010, pp. 11-17.
- Ron Wakkary, Kevin Muise, Karen Tanenbaum, Marek Hatala, and Leora Kornfeld (2008) Situating Approaches to Interactive Museum Guides. *Museum Management and Curatorship*, Vol. 23, No. 4, pp. 367-383.

Book Chapters

- Ron Wakkary, Audrey Desjardins, Kevin Muise, Karen Tanenbaum and Marek Hatala (2012) Situating the Sociability of Interactive Museum Guides. In Elisa Giaccardi (Ed.), *Heritage and Social Media: Understanding Heritage in Participatory Culture*. Routledge, pp. 217-238.
- Karen Tanenbaum and Alissa N. Antle (2009) A Tangible Approach to Concept Mapping. In S.-I. Ao (Ed.), *IAENG Transactions on Engineering Technologies Volume II: Special Edition of the World Congress of Engineering and Computer Science*, CP 1127, American Institute of Physics, pp. 121-132.

Conference Papers and Posters

- Josh Tanenbaum, Amanda Williams, Audrey Desjardins and Karen Tanenbaum (forthcoming). Democratizing Technology: Pleasure, Utility and Expressiveness in DIY and Maker Practice. *Conference on Human Factors in Computing Systems (CHI) 2013* (Paris, France, April 27-May 2 2013).
- Josh Tanenbaum, Karen Tanenbaum, and Ron Wakkary (2012). Steampunk as Design Fiction. In *Proceedings of the 2012 ACM annual conference on Human Factors in Computing Systems (CHI)*, (Austin, Texas, May 5-10, 2012), pp. 1583-1592. *Best Paper Honorable Mention*
- Karen Tanenbaum (2011) User Perceptions of Adaptivity in Ubiquitous Systems: A Critical Exploration. *PhD Forum 3-HCI and Systems at Grace Hopper Celebration of Women in Computing*, (Portland, OR, November 9-12, 2011), pp. 88-93.
- Alissa Antle, Joshua Tanenbaum, Karen Tanenbaum, Allen Bevans, Sijie Wang, and Katie Seaborn. (2011) Balancing act: Enabling public engagement with sustainability issues through a multi-touch tabletop collaborative game. In *Proceedings of INTERACT*, (Lisbon, Portugal, Sept 5-9, 2011), pp. 194-211.
- Karen Tanenbaum, Marek Hatala, and Joshua Tanenbaum (2011) User Perceptions of Adaptivity in an Interactive Narrative. In *Proceedings of User Modeling, Adaptation and Personalization (UMAP)*, (Girona, Spain, July 11-15, 2011) pp. 389-400.
- Joshua Tanenbaum, Karen Tanenbaum, Jim Bizzocchi and Alissa Antle. (2011) Understanding Narrative and Embodied Interactions with "Present-at-Mind". At *Embodied Interaction: Theory and Practice in HCI Workshop at CHI 2011*, (Vancouver, British Columbia, May 8th, 2011), 4 pages.
- Marek Hatala, Karen Tanenbaum, Josh Tanenbaum (2011) Adaptivity in Ubiquitous Systems: An Experimental Study. In *Proceedings of Znalosti 2011*, pp. 259 – 262.

- Karen Tanenbaum, Josh Tanenbaum, Alissa N. Antle, Jim Bizzocchi, Magy Seif El-Nasr, Marek Hatala (2011) Experiencing the Reading Glove. In *Proceedings of Tangible, Embedded and Embodied Interaction (TEI)*, Funchal, Portugal, January 23-26, ACM Press, pp. 137-144.
- Josh Tanenbaum, Karen Tanenbaum, Magy Seif El-Nasr, Marek Hatala (2010) Authoring Tangible Interactive Narratives Using Cognitive Hyperlinks. *3rd Workshop on Intelligent Narrative Technologies (INT3) at Foundations of Digital Games (FDG 2010)*, June 18, 2010, Monterey, California, 8 pages.
- Joshua Tanenbaum, Alissa Antle, Karen Tanenbaum, Allen Bevans, Sijie Wang, and Katie Seaborn (2010) Futura: A Case Study in the Design of an Educational Multi-Touch Tabletop Game. *Games, Learning and Society (GLS 2010)* Madison, Wisconsin, June 9-11, Poster.
- Josh Tanenbaum, Karen Tanenbaum and Alissa Antle (2010) The Reading Glove: designing interactions for object-based tangible storytelling. In *Proceedings of the 1st Augmented Human International Conference*, Megeve, France, April 2-3, ACM Press, pp. 132-140.
- Karen Tanenbaum & Josh Tanenbaum (2009) Commitment to Meaning: A Reframing of Agency in Games. In *Proceedings of the 8th Conference on Digital Arts and Culture (DAC)*. Irvine, CA, December 12-15, 9 pages.
- Marek Hatala, Karen Tanenbaum, Ron Wakkary, Kevin Muise, Bardia Mohabbati, Greg Corness, Jim Budd, Tom Loughin, (2009) "Experience Structuring Factors Affecting Learning in Family Visits to Museums." In U. Cress, V. Dimitrova, & M. Specht (Eds.): "Learning in the Synergy of Multiple Disciplines", *Proceedings of the 4th European Conference on Technology Enhanced Learning (ECTEL09)*, LNCS 5794, Springer-Verlag, Sept/Oct 2009, pp.37-51.
- Ron Wakkary and Karen Tanenbaum (2009) A Sustainable Identity: The Creativity of an Everyday Designer. In *Proceeding of the 27th annual SIGCHI Conference on Human Factors in Computing Systems (CHI)*, Boston, MA, April 4-9, ACM Press, pp. 365-374.
- Alissa Antle, Nima Motamedi, Karen Tanenbaum, Lesley Xie, (2009) The EventTable Technique: Distributed Fiducial Markers. In *Proceedings of Conference on Tangible and Embedded Interaction (TEI)*, Cambridge, UK, February 16-18, ACM Press, pp. 307-313.
- Ron Wakkary, Marek Hatala, Kevin Muise, Karen Tanenbaum, Bardia Mohabbati, Jim Budd, (2009) Kurio: A Museum Guide For Families. In *Proceedings of Conference on Tangible and Embedded Interaction (TEI)*, Cambridge, UK, February 16-18, ACM Press, pp. 215-222.
- Karen Tanenbaum and Alissa Antle, (2008) Using Physical Constraints to Augment Concept Mapping on a Tangible Tabletop. In S. I. Ao, C. Douglas, W.S. Grundfest, L. Schruben and J. Burgstone (Eds.): *World Congress on Engineering and Computer Science (WCECS 2008)*, *International Conference on Education and Information Technology*, San Francisco, CA, October 22-24, IAENG: San Francisco, USA. LNECS 2186, pp. 539-547.
- Josh Tanenbaum and Karen Tanenbaum, (2008) Improvisation and Performance as Models for Interacting with Stories. In U. Spierling & N. Szilas, (Eds.): *Interactive Storytelling, First Joint International Conference on Interactive Digital Storytelling (ICIDS)*, Erfurt, Germany, November 26-29, LNCS 5334, pp. 250-263.
- Kevin Muise, Karen Tanenbaum, Ron Wakkary, Marek Hatala, (2008) A Report on Participatory Workshops for the Design of Adaptive Collaborative Learning. In *Workshop on Adaptive Collaboration Support in Adaptive Hypermedia (AH2008)*, Bonn, Germany, July 28, 4 pages.
- Ron Wakkary, Kevin Muise, Karen Tanenbaum, Marek Hatala, Leora Kornfeld (2007). Situating Approaches to Museum Guides for Families and Groups. In J. Trant and D. Bearman (Eds.): *Proceedings of International Cultural Heritage Informatics Meeting (ICHIM07)*, Toronto, Canada, October 24-26, Archives & Museum Informatics, pp. 367-383.

Conference Presentations

- Karen Tanenbaum (2011) User Perceptions of Adaptivity in Ubiquitous Systems: A Critical Exploration. *PhD Forum 3-HCI & Systems, Grace Hopper Celebration of Women in Computing*, November 9, 2011, Portland, OR.
- Josh Tanenbaum and Karen Tanenbaum (2010) Authoring Tangible Interactive Narratives Using Cognitive Hyperlinks. *3rd Workshop on Intelligent Narrative Technologies (INT3) at Foundations of Digital Games Conference (FDG 2010)*, June 18, 2010, Monterey, CA.
- Karen Tanenbaum and Josh Tanenbaum (2010) Commitment to Meaning: A Reframing of Agency in Games. *Digital Arts & Culture Plenary Session (DAC'09)*, Irvine, CA, December 15th 2009.
- Karen Tanenbaum (2008) Using Physical Constraints to Augment Concept Mapping on a Tangible Tabletop. *International Conference on Education and Information Technology (WCECS 2008)*, San Francisco, CA, October 22-24, 2008.
- Karen Tanenbaum and Kevin Muise (2007) Situating Approaches to Museum Guides for Families and Groups. *International Cultural Heritage Informatics Meeting (ICHIM07)*, Toronto, Canada, October 24-26, 2007.
- Karen Tanenbaum (2004) Modeling German Gender. *North American Summer School in Logic, Language and Information (NASSLLI)*, Los Angeles, CA, June 21-25, 2004.

Teaching Experience

Sessional Faculty, Emily Carr University of Art & Design, 2011

Courses: 4D/Interaction Core Design Studio

Responsibilities:

- Developed new course curriculum, including writing lectures, selecting readings, creating weekly assignments and projects, designing a grading rubric and setting up in-class workshops
- Taught 3 hour classes twice a week, with a mixture of lectures, reading discussions, workshops, student presentations, and in-class assignments
- Graded projects, assignments, and participation using Moodle course management software

Teaching Assistant, Simon Fraser University, School of Interactive Arts & Technology, 2006-2010

Courses: Systems of Media Representation, Design Studio (Arts/Science), Design for Digital Environments, New Media Images

Responsibilities:

- Ran labs teaching basic principles of composition and design for photography, film, animation and the web using Photoshop, Dreamweaver, Premier Pro and Flash
- Organized and supervised the demonstration of student projects
- Held office hours to work with students on individual issues
- Attended regular meetings to coordinate instructional goals with the lecturer and other TAs
- Graded projects and quizzes using WebCT course management software

Teaching Assistant, University of California-San Diego, Department of Linguistics, 2002-2004

Courses: Making & Breaking Codes, Morphology, Sign Language & its Culture

Departmental Teaching Assistant Excellence Award, 2004

Responsibilities:

- Held office hours to assist students in understanding lectures and homework assignments
- Attended regular meetings to coordinate instructional goals with the professor and other TAs
- Graded projects and quizzes using WebCT course management software

Scholarships and Awards

- Robert, Edwin, Richard and Elisabeth Eppich Graduate Scholarship in Intelligent Systems, 2012, \$700
- NSF Scholarship, Grace Hopper Celebration of Women in Computing, 2011, Attendance costs
- Borden Ladner Gervais Graduate Scholarship in Intelligent Systems, 2011, \$1000
- First Place in Inventiveness Category for “Captain Chronomek”, Tangible Embedded and Embodied Interaction Conference, Superhero Design Challenge, 2011, \$1000
- Award of Excellence, International Digital Media Arts Association Conference (iDMAa), Student Showcase, 2010, \$300
- Simon Fraser University Graduate Fellowship, 2010, \$6250
- Simon Fraser University President’s Research Stipend, 2010, \$6250
- Westak International Sales Inc. Scholarship in Intelligent Systems, 2010, \$700
- Simon Fraser University Graduate Fellowship, 2009, \$6250
- Clark, Wilson Scholarship in Intelligent Systems, 2009, \$1400
- First Place for “SENSe”, Bluesky Innovations Competition on “Social Computing in 2020”, 2009, \$3000
- Simon Fraser University Graduate Fellowship, 2008, \$6250
- First Place for the film “Takeout for Two”, 5th Annual Quick Flick Challenge, 2008, \$500
- Simon Fraser University Graduate Fellowship, 2007, \$6250
- Simon Fraser University Graduate Fellowship, 2006, \$6250
- University of California San Diego Dean’s Fellowship, 2003-2004, \$5000
- University of California San Diego Pre-Doctoral Humanities Fellowship, 2002-2003, \$15000
- University of Redlands, National Merit Scholar, 1998-2002, \$80000

Academic and Community Service

- Reviewer, Digital Games Research Association (DiGRA) 2013, March 2013
- Reviewer, Conference on Human Factors in Computing Systems (CHI) 2013, Fall 2012
- Speaker, Girls Get IT (Innovative Technology) Summer Camp, Hillsboro High School, Summer 2012
- Reviewer, Designing Interactive Systems (DIS) 2012, Spring 2012
- Community Volunteer Blogger, Grace Hopper Celebration of Women in Computing, Fall 2011
- Lead Ambassador and Founder, Vancouver branch of Girl Geek Coffees discussion group, Fall 2011
- Reviewer, Conference on Human Factors in Computing Systems (CHI) 2012, Fall 2011
- Graduate Student Member, University Wide Research IT Committee, Summer 2010-Summer 2011
- Reviewer and Program Committee Member, Tangible, Embedded and Embodied Interaction Conference (TEI) 2011, Fall 2010
- Reviewer, Conference on Human Factors in Computing Systems (CHI) 2010, Fall 2009
- School of Interactive Arts and Technology (SIAT) Representative, Faculty of Communication, Arts and Technology Graduate Student Working Group, Fall 2008-Spring 2009
- Graduate Student Representative, SIAT School Committee, Summer 2007-Spring 2009
- Secretary, SIAT Graduate Student Association, Summer 2007-Summer 2008
- Peer Mentor, SIAT New Student Orientation, Fall 2007