ORIT SHAER

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EDUCATION

2004-2008 TUFTS UNIVERSITY, DEPARTMENT OF COMPUTER SCIENCE
PhD in Computer Science
Dissertation: *A Visual Language for Programming Tangible User Interfaces.*
Committee: Robert Jacob (Chair), Samuel Guyer, Judith Stafford, Harriet Fell, Ray Jackendoff

2002-2004 TUFTS UNIVERSITY, DEPARTMENT OF COMPUTER SCIENCE
Master of Science in Computer Science

1998-2001 THE ACADEMIC COLLEGE OF TEL-AVIV
Bachelor of Arts degree in Computer Science
Dean's Honors List

ACADEMIC POSITIONS

2008-Present WELLESLEY COLLEGE, DEPARTMENT OF COMPUTER SCIENCE
Clare Boothe Luce Assistant Professor of Computer Science
Director Human-Computer Interaction Laboratory
Co-Director Media Arts and Sciences program (2010-2012)
An interdepartmental major supported by the Art and Computer Science departments.

2003-2008 TUFTS UNIVERSITY, DEPARTMENT OF COMPUTER SCIENCE
Research Assistant, Instructor

2005-2006 UNIVERSITY COLLEGE LONDON, INTERACTION CENTRE
Visiting Research Fellow

2003-2004 UNIVERSITY OF WASHINGTON, DESIGN MACHINE
Visiting Researcher

HONORS

2014 ACM CHI Best Paper Award Honorable Mention.

2013 Pinanski Teaching Prize, Wellesley College.

2013 Google App Engine Education Award.

2012 Gold Medal, Best Eugene Project, Best Requirements Engineering, Best SBOL project, iGEM.

2011 Gold Medal and Best Software Tool, International Genetically Engineered Machine competition (iGEM).

2009 Clare Boothe Luce Professorship in Computer Science.

2007 Outstanding Graduate Contributor to Engineering Education, Tufts University.

2006 Graduate Consortium Award, IEEE Symposium on Visual Languages and Human-Centric Computing.

2005 CHI Doctoral Consortium Award, ACM Conference on Human Factors in Computing Systems.

2004 Grace Hopper Scholarship for the Celebration of Women in Computing.

2003 Summer Institute of College Teaching scholarship, Tufts University.

2002-2008 Merit-based scholarship and full tuition, Tufts University.

GRANTS

2014-2017	**National Science Foundation** IIS, Human-Computer Interaction for Personal Genomics: Understanding, Informing, and Empowering Users ($342,930). Role: PI
2014	Wellesley College Brachman Hoffman Award, Evaluating the Benefits of Interactive Stereo Displays for Spatial Problem Solving Using fNIRS Brain Sensing ($12,392). Role: PI
2013	**Agilent Technologies** Inc., Evaluating the Benefits of Interactive 3D Stereo Displays for Biological Design. ($41,289). Role: PI
2012-2017	**National Science Foundation CAREER** HCC, Advancing Innovation in Bio-Design through Reality-Based Interaction ($472,217). Role: PI
2012	**Agilent Technologies**, Advancing Innovation in Bio-Design through Tabletop Reality-Based Interaction ($27,237). Role: PI
2012	**National Science Foundation** IIS, Workshop: Doctoral Symposium at the 2012 Interactive Tabletops and Surfaces Conference ($21,987). Role: PI
2010-2013	**National Science Foundation** IIS, Enhancing Genomic Exploration through Reality-Based Interaction ($268,712). Role: PI
2011-2012	**National Science Foundation** IIS, Graduate Student Consortium at the 2012 Tangible, Embedded and Embodied Interaction (TEI'11) Conference ($24,800). Role: PI
2011-2012	**Howard Hughes Medical Institute** intern award (through Wellesley College), Enhancing Scientific Discovery through Reality-Based Interaction ($45,380). Role: PI
2011	Wellesley College Educational Research and Development grant (with Kristina Jones), Handheld devices and student-designed apps for engaging in science at Wellesley ($2,861). Role: co-PI
2011	Wellesley College Faculty Research Award, Enhancing Group Brainstorming through Tabletop Reality-Based Interaction ($3,300). Role: PI
2010	Wellesley College Educational Research and Development grant (with Brian Tjaden and Franklyn Turbak), Rapid Prototyping in CS111 ($1,200). Role: co-PI
2009	Wellesley College Brachman-Hoffman Grant, Enhancing Scientific Discovery through Reality-Based Interaction ($4,015). Role: PI
2008	Wellesley College Faculty Research Award, Enhancing Human-Computer Interactions through Whole-body Movement ($2,300). Role: PI

TEACHING

2009-Present	Tangible User Interfaces, Wellesley College (CS320)
2009-Present	Human-Computer Interaction, Wellesley College (CS220)
2012-Present	Data Structures, Wellesley College (CS230)
2009-2012	Computer Programming and Problem Solving, Wellesley College (CS111)
2011-2012	Computer Science and the Internet, Wellesley College (CS110)
2006-2008	Tangible User Interfaces, Tufts University (COMP150)

PROFESSIONAL ACTIVITIES

CHAIR	ACM International Conference on Interactive Tabletops and Surfaces, 2012.
PROGRAM COMMITTEE	ACM SIGCHI Symposium on Engineering Interactive Computing Systems, 2013. ACM CHI 2012. ACM International Conference on Interactive Tabletop and Surfaces, 2011. International Conference on Tangible and Embedded Interaction (TEI), **Program Co-Chair**, 2010, **Graduate Student Consortium Co-Chair**, 2012. ACM UIST Symposium, 2010. International Conference on Tangible and Embedded Interaction (TEI) 2007-2008, 2011.
EDITOR	**Editorial Board**, Foundations and Trends in Human–Computer Interaction, 2011 – Present. ACM TOCHI, Special Issue on User Interface Description Languages for Next Generation User Interfaces, Spring 2009.
GRANT REVIEWER	National Science Foundation.
REVIEWER	ACM CHI 2005-2014, UIST 2011-2014, Ubicomp 2011, Creativity and Cognition 2011, EICS 2010 – 2014, The Journal of Personal and Ubiquitous Computing, International Journal of Arts and Technology, The Journal of Advances in Human-Computer Interaction, IwC Journal (Interacting with Computers), IEEE Transactions on Systems Man and Cybernetics, Artificial Intelligence for Engineering Design, Analysis and Manufacturing.
SERVICE TO THE COLLEGE	Agenda Committee (elected 2011-2012, 2013-2015) Pinanski Committee (2014) Ruhlman Committee (2014) Co-Director Media Arts and Sciences (2010-2012) Advisory Committee on Library and Technology (2010-2011) Board of Admission (2009-2010)
SERVICE TO THE DEPARTMENT	Student Travel Committee (2014) Computer Science Faculty Search Committee (2013-2014) Committees on: Minority Students, Introductory Courses, Experiences Outside the Classroom (2011-2012) Admission liaison (2010-2012) Tanner Technology Fellows, co-advisor (2010) Computer Science Cirque du CS, student presentations coordinator (2011) Alumnae panel organizer (2009) Computer Science Faculty Search Committee (2009)

PUBLICATIONS (Wellesley students and alumnae are denoted in bold)

REFEREED JOURNAL ARTICLES

J.1 O.Shaer, **C. Valdes**, **S. Liu**, **K. Lu**, **K. Chang**, **W. Xu**, T. L. Haddock, S. Bhatia, D. Densmore, R. Kincaid, Designing Reality-Based Interfaces for Experiential Bio-Design, *Personal and Ubiquitous Computing*, November 2013.

J.2 O. Shaer, **M. Strait**, **C. Valdes**, **H. Wang**, **T. Feng**, **M. Lintz**, **M. Ferreirae**, **C. Grote**, **K. Tempel**, **S. Liu**, The Design, Development, and Deployment of a Tabletop Interface for Collaborative Exploration of Genomic Data, *International Journal of Human-Computer Studies (IJHCS)*, 2012.

J.3 O. Shaer, E. Hornecker, Tangible User Interfaces: Past, Present, and Future Directions, *Foundations and Trends in Human-Computer Interaction*, Vol. 3, Issue 1-2, April 2010.

J.4 O. Shaer, R.J.K Jacob, A Specification Paradigm for the Design and Implementation of Tangible User Interfaces, *ACM Transactions on Computer-Human Interaction (TOCHI)*, Vol. 16, No. 4, November 2009.

J.5 O. Shaer, M.S. Horn, R.J.K. Jacob, Tangible User Interface Laboratory: Teaching Interaction Design in Practice, *AIEDAM Special Issue on Tangible Interaction for Design*, Spring 2009, Vol 23, No. 2.

J.6 O. Shaer, N. Leland , E.H Calvillo, R.J.K. Jacob, The TAC Paradigm: Specifying Tangible User Interfaces, *Personal and Ubiquitous Computing*, vol. 8, no. 5, pp. 359-369, September 2004.

REFEREED LONG CONFERENCE PAPERS

C.1 **C. Valdes**, **D. Eastman**, **C. Grote**, S. Thatte, O. Shaer, A. Mazalek, B. Ullmer, M. Konkel, Exploring the Design Space of Gestural Interaction with Active Tokens through User-Defined Gestures. *ACM CHI 2014 Human Factors in Computing Systems Conference*. (Acceptance Rate 23%). **Best Paper Award Honorable Mention** [Awarded to top 5%].

C.2 **O. Shaer**, **C. Valdes**, **S. Liu**, **K. Lu**, T. L. Haddock, S. Bhatia, D. Densmore, R. Kincaid, MoClo Planner: Interactive Visualization for Modular Cloning Bio-Design, *IEEE BioVis 2013.* (Acceptance rate 40%).

C.3 O. Shaer, A. Mazalek, B. Ullmer, M. Konkell, From Big Data to Insights: Opportunities and Challenges for TEI in Genomics, *ACM SIGCHI TEI 2013 Tangible, Embedded and Embodied Interaction.* (Acceptance rate 31%).

C.4 **C. Valdes**, **M. Ferreirae**, **T. Feng**, **H., Wang**, **K. Tempel**, **S. Liu**, O.Shaer, A Collaborative Environment for Engaging Novices in Scientific Inquiry, *ACM ITS 2012 Interactive Tabletops and Surfaces.* (Acceptance rate 29%).

C.5 B. Schneider, **M. Strait**, L. Muller, **S. Elfenbein**, O.Shaer, C. Shen, Phylo-Genie: Engaging Students in Collaborative 'Tree-Thinking' through Tabletop Techniques, *ACM CHI 2012 Human Factors in Computing Systems Conference.* (Acceptance rate 23%).

C.6 O. Shaer, **M. Strait**, **C. Valdes**, **T. Feng**, **M. Lintz**, **H. Wang**, Enhancing Genomic Learning through Tabletop Interaction, *ACM CHI 2011 Human Factors in Computing Systems Conference*. (Acceptance rate 26%).

C.7 O. Shaer, J. Olson, **M. Edwards**, **C. Valdes**, Art App-reciation: Fostering Engagement and Reflection in Museums through a Social-Mobile Application, *Museums and the Web 2011*.

C.8 O. Shaer, G. Kol, **M. Strait**, **C. Fan**, **C. Grevet**, **S. Elfenbein**, G-nome Surfer: a Tabletop Interface for Collaborative Exploration of Genomic Data, *ACM CHI 2010 Human Factors in Computing Systems Conference*. (Acceptance rate 22%).

C.9 R.J.K. Jacob, A. Girouard, L.M. Hirshfield, M.S. Horn, O. Shaer, E.T. Solovey, J. Zigelbaum, Reality-Based Interaction: A Framework for Post-WIMP Interfaces, *ACM CHI 2008 Human Factors in Computing Systems Conference*. (Acceptance rate 22%).

C.10 J. Zigelbaum, M. Horn, O. Shaer, R.J.K. Jacob, The Tangible Video Editor: Collaborative Video Editing with Active Tokens, *ACM TEI 2007 Conference on Tangible and Embedded Interaction.* (Acceptance rate 40%).

INVITED PAPERS

I.1 O. Shaer, O. Nov, HCI for Personal Genomics: Understanding, Informing and Empowering Non-Experts, *Interactions*, September-October 2014 (*in press*).

I.2 O. Shaer, A. Millner, C. Hummles, Trajectories in TEI: Reflecting on the Evolution of Ideas Innovators and Interactions, *Interactions*, November-December 2012.

I.3 R.J.K. Jacob, A. Girouard, L.M. Hirshfield, M. Horn, O. Shaer, E.T. Solovey, J. Zigelbaum, What Is the Next Generation of Human-Computer Interaction?, *Interactions*, vol. 14, no. 3, pp. 53-58, May 2007.

REFEREED EXTENDED ABSTRACTS

A.1 O. Shaer, O. Nov, Treemap Visualization of Personal Genomic Reports, Work in Progress abstract, Biovis 2014.

A.2 O. Shaer, O. Nov, **A. West**, **D. Eastman**, Understanding Information Practices of Interactive Personal Genomics Users. Extended abstract, *ACM CHI 2014 Human Factors in Computing Systems Conference*.

A.3 **I. Kwok**, **C. Lee**, **J. Okerlund**, **Q. Zhu**, O. Shaer, musicAir: Creating Music Through Movement, Work in Progress abstract, *ACM SIGCHI TEI 2014 Tangible, Embedded and Embodied Interaction*.

A.4 **W. Xu**, **K. Chang**, **N.Francisco**, **C. Valdes**, R. Kincaid, O. Shaer, From Wet Lab Bench to Tangible Virtual Experiment: SynFlo, Extended abstract, *ACM SIGCHI TEI 2013 Tangible, Embedded and Embodied Interaction*.

A.5 **S.Liu**, **K. Lu**, **N. Seifeselassie**, **C. Grote**, **N. Francisco**, **V. Lin**, **L. Ding**, **C. Valdes**, R. Kincaid, O. Shaer, MoClo Planner: Supporting Innovation in Bio-Design through Multitouch Interaction, Demo abstract, *ACM ITS 2012 Interactive Tabletops and Surfaces*.

A.6 **K. Chang**, **W. Xu**, **N.Francisco**, **C. Valdes**, R. Kincaid, O. Shaer, SynFlo: An Interactive Installation Introducing Synthetic Biology Concepts, Demo abstract, *ACM ITS 2012 Interactive Tabletops and Surfaces*.

A.7 O. Shaer, **M. Strait**, **C. Valdes**, **T. Feng**, **M. Lintz**, **H. Wang**, G-nome Surfer: a Tabletop Interface for Collaborative Exploration of Genomic Visualization, *IEEE BioVis 2011*.

A.8 **D. Garrahan**, O. Shaer, **A. Piplica**, K. Gold, Leveraging Gesture and Voice Data to Improve Group Brainstorming. Work In Progress, *ACM CHI 2010 Human Factors in Computing Systems Conference*, Extended abstracts.

A.9 O. Shaer, R.J.K Jacob, M. Green, K. Luyten, User Interface Description Languages for Next Generation User Interfaces, *ACM CHI 2008 Human Factors in Computing Systems Conference*, Workshop abstract.

A.10 A. Bean, S. Siddiqi, A. Chowdhury, B. Whited, O. Shaer, R.J.K Jacob, Marble Track Audio Manipulator (MTAM): A Tangible User Interface for Audio Composition, *TEI 2008 International Conference on Tangible and Embedded Interaction*.

A.11 R.J.K. Jacob, A. Girouard, L.M. Hirshfield, M.S. Horn, O. Shaer, E.T. Solovey, J. Zigelbaum, Reality-Based Interaction: Unifying the New Generation of Interaction Styles, *ACM CHI 2007 Human Factors in Computing Systems Conference*.

A.12 A. Girouard, E.T. Solovey, L. Hirshfield, S. Ecott, O. Shaer, R.J.K. Jacob, Smart Blocks: A Tangible Mathematical Manipulative, *TEI 2007 International Conference on Tangible and Embedded Interaction*.

A.13 O. Shaer and R.J.K. Jacob, A Visual Language for Programming Reality-Based Interaction, *IEEE Symposium on Visual Languages and Human-Centric Computing*, Graduate Student Consortium, 2006.

A.14 O. Shaer, A Framework for Building Reality-Based Interfaces for Wireless-Grid Applications, ACM CHI 2005 *Human Factors in Computing Systems Conference*, Doctoral Consortium.

REFEREED WORKSHOP PAPERS

W.1 A. Mazalek, O. Shaer, B. Ullmer, M. Konkel, Tangible Meets Gestural: Gesture Based Interaction with Active Tokens, *ACM CHI 2014 Workshop on Gesture-based Interaction Design: Communication and Cognition*.

W.2 O. Shaer, **C. Valdes**, **C. Grote**, **W. Xu**, and **T. Feng**, Enhancing Data-Driven Collaboration with Large-Scale Interactive Tabletops, *ACM CHI 2013 Workshop on Blended Interaction*.

W.3 O. Shaer, **C. Valdes**, A Tiered Evaluation Framework for Reality-Based Creativity Support Environments, *ACM CHI 2013 Workshop on Evaluation Methods for Creativity Support Environments*.

W.4 **C. Valdes**, **T. Feng**, O. Shaer, Waiting for Supermom: Opportunities for HCI, *ACM CHI 2013 Workshop on Motherhood and HCI*.

W.5 O. Shaer, M. Umachi Bers, M. Chang, Making the Invisible Tangible: Learning Biological Engineering in Kindergarten, *ACM CHI 2011 Workshop on User Interface Technology and Educational Pedagogy*.

W.6 O. Shaer, Advancing Collaboative Discovery through Reality-Based Interaction, *ACM CHI 2011 Workshop on Embodied User Interfaces*.

W.7 O. Shaer, G-nome Surfer: a Tabletop Interface for Collaborative Exploration of Genomic Data, *ICLS 2010 Workshop on Collaborative Learning with Interactive Surfaces: An Interdisciplinary Agenda*.

W.8 O. Shaer, Exploring Reality-Based Interaction through Whole-Body Movement, *ACM CHI 2009 Workshop on Whole Body Interaction*.

W.9 E.T. Solovey, O. Shaer, A. Girouard, L.M. Hirshfield, M.S. Horn, J. Zigelbaum, R.J.K. Jacob, Programming Reality Within the Reality-Based Interaction Framework, *ACM CHI 2009 Workshop on Organic User Interfaces*.

W.10 M.S. Horn, O. Shaer, A. Girouard, L.M. Hirshfield, E.T. Solovey, J. Zigelbaum, R.J.K. Jacob, Putting Tangible User Interfaces in Context: A Unifying Framework for Next Generation HCI, *ACM CHI 2007 Workshop on Tangible User Interfaces in Context and Theory.*

OTHER

O.1 **C. Grevet**, S. Lee, O. Shaer, **M. Strait**, D. Xu, S. Wang, Lessons Learned from the All Female Classroom, and How to Translate into the Coed Environment, *Grace Hopper Celebration of Women in Computing*, panel, November 2011.

O.2 T. Pederson, O. Shaer, R. Wakkary, Welcome to the TEI'10 Proceedings, *Proceedings of the fourth international conference on Tangible, embedded, and embodied interaction*, January 2010.

O.3 O. Shaer, R.J.K. Jacob, M. Green, K. Luyten, Introduction to the special issue on UIDL for next-generation user interfaces, *ACM Transactions on Computer-Human Interaction (TOCHI)*, Vol. 16, No. 4, November 2009.

INVITED TALKS AND PANELS

Reality-Based Interfaces for Collaborative Exploration

Boston University, International Workshop on Bio-Design Automation, **Keynote**, June 2014.
Williams College, Clare Boothe Luce Scholars Program, January 2014.
Boston University, Center for Information and Systems Engineering seminar, November 2013.
Holon Institute of Technology, Israel, Interaction Lab Seminar, May 2013.
Helsinki Institute of Technology, Big Data Visualization and Interaction Workshop, April 2013.
Harvard University, Liberact Workshop, February 2013.
MIT, Human Automation Laboratory seminar, October 2012.
Olin College of Engineering, Human Factors and Interface Design, October 2012.
Worcester Polytechnic Institute, Computer Science Colloquia series, October 2011.
Wellesley College, Science Faculty Seminar, March 2011.
Tufts University, Developmental Technologies Seminar, Child Development, July 2010.
Olin College of Engineering, Human Factors and Interface Design, October 2009.

Interdisciplinary Science, Liberal Arts Learning in the Digital Age Seminar Series

Wellesley College, February 2012 (Panelist).

Lessons Learned from the All Female Classroom, and How to Translate into the Coed Environment

Grace Hopper Celebration of Women in Computing, November 2011 (Panelist).

Enhancing Genomic Learning through Tabletop Interaction

BostonCHI Labs meeting, Microsoft, April 2011.

A Specification Paradigm for the Design and Implementation of Tangible User Interfaces

MIT Computer Science and Artificial Intelligence Lab, HCI Seminar Series, May 2009.

Specifying and Programming Next Generation User Interfaces

Northeastern University, Computer Science Department, November 2008.

Reality Based Interaction: Understanding Next Generation User Interfaces

BostonCHI, Sun Microsystems, June 2008.
Wellesley College, Computer Science Department, February 2008.
MIT Media Lab, Tangible Media Group, February 2008.

User Interface Software Tools, **Principles and Trends**

ACM CHI'07 Course, Introduction to Human Computer Interaction, April 2007.

A Visual Language for Programming Tangible User Interfaces

University College London Interaction Center, November 2005.

MEDIA COVERAGE

Day in the Lab: Wellesley College HCI Lab, **Interactions Magazine**:
http://interactions.acm.org/archive/view/may-june-2014/whci-lab-wellesley-college

The Human Touch, **Wellesley Magazine**: http://issuu.com/wellesley/docs/wellesley_fall13_issuu/13.

HCI Lab Renovated with Generous Support of Amy Batchelor '88 and Brad Feld, **Wellesley College News**:
http://www.wellesley.edu/news/2013/10/node/39877#sthash.qWAgM6Ze.dpuf

GreenTouch: data capture, curation, and analysis via a multi-touch tabletop interface, **Research at Google Blog**: https://plus.google.com/+ResearchatGoogle/posts/LfVbcZY1E41

Pinanski Honorees Represent Computer Science, English, and Psychology, **Wellesley College News**:
http://www.wellesley.edu/news/2013/06/node/35989#sthash.Hqh7ulrP.dpuf

Two of 11 Google App Engine Awards Go To Wellesley Faculty, **Wellesley College News**:
http://new.wellesley.edu/news/2013/04/node/34790

Google App Engine Education Awards, **Research at Google**:
http://research.google.com/university/relations/appengine/education_awards.html

Wellesley Scores Big at International Synthetic Biology Competition, **Wellesley College News**:
http://new.wellesley.edu/news/stories/node/31416

Tangible User Interfaces: Technology You Can Touch, **IEEE Computer**:
http://www.computer.org/csdl/mags/co/2012/06/mco2012060015-abs.html.

Then and Now Botany Notes, **Wellesley College News**:
http://www.wellesley.edu/youarehere/renew/botany/node/26258

Teaching Tree-Thinking Through Touch, **Science Daily**, Science News:
http://www.sciencedaily.com/releases/2012/06/120604111121.htm?utm_source=feedburner&utm_medium=feed&utm_campaign=Feed%3A+sciencedaily+%28ScienceDaily%3A+Latest+Science+News%29

Teaching Tree Thinking through Touch, **ACM Tech News**: http://technews.acm.org/archives.cfm?fo=2012-06-jun/jun-06-2012.html

Wellesley Genome Browser Uses Touch Technology to Enable Interactive Visualization of Sequence Data, **Bioinform**:
http://www.genomeweb.com/node/989996?hq_e=el&hq_m=1145514&hq_l=4&hq_v=ee5be59dc1

Profile of a Major: Media Arts and Sciences, **Wellesley Magazine**:
http://issuu.com/wellesley/docs/2011_fall_issuu

Microsoft Touch Mouse TUI.TAR, **Softpedia News**: http://news.softpedia.com/news/Microsoft-Touch-Mouse-TUI-TAR-232164.shtml

Meet the Winners of the UIST contest, Hrvoje Benko, **Microsoft Hardware Blog**:
http://microsofthardwareblog.com/

Engineering from Prank to Product, Jeanne Dietsch, **IEEE Robotics & Automation Magazine**:
http://ieeexplore.ieee.org/xpl/freeabs_all.jsp?arnumber=6016597

Mass High-Tech Emerging Technology Forum Looks at Superhero Tech, James M. Connolly, **Mass High-Tech**: http://www.masshightech.com/stories/2011/06/20/daily55-MHTs-Emerging-Technology-Forum-looks-at-Superhero-tech.html

Art app-reciation, Taylor Adams, **Boston Globe**: http://www.boston.com/ae/theater_arts/articles/2010/08/06/macherie_edwardss_smart_phone_app_helps_people_get_the_most_out_of_the_museum/