

Curriculum Vitae

Tovi Grossman

Distinguished Research Scientist
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Citizenship: Canada

RESEARCH INTERESTS

My research lies in the general area of Human-Computer Interaction, with a primary focus on understanding and improving human learning in complex scenarios. In particular, I have been exploring how emerging trends and technologies, such as wearables, the Internet of Things, and gamification can be leveraged to enhance learning and knowledge sharing for both feature-rich software applications and real-world physical tasks. Topics include: video-based assistance, community-based assistance, context-aware assistance, software learning gamification, command recommender systems, and workflow capture and analysis.

My other main research interest is in the design of input and interaction for new forms of media and technology, covering a wide range of topics relevant to HCI. Typically, my work in these areas involve low level empirical studies to improve our understanding of the human factors associated with these technologies, and the design and implementation of novel techniques and interfaces to provide enhanced and compelling user experiences. Topics include: Interactive graphics and 3D modeling, sketch-based animation, interactive digital fabrication, wearable and implanted user interfaces, and gesture-based interaction.

In addition to this work leading to an extensive international publication record, I have a strong passion for pursuing ways in which my research can have real-world impact. I have been involved in a number of successful transfers of my research leading to new technologies and products used by millions of users, such as Autodesk Screencast, Autodesk ToolClip™ videos, and Autodesk Sketchbook Motion.

EDUCATION

Ph.D. in Computer Science. 2008.

Department of Computer Science, University of Toronto.

Thesis Title: "Interaction with Volumetric Displays".

Advisor: Ravin Balakrishnan

M.Sc. in Computer Science. 2004.

Department of Computer Science, University of Toronto.

Thesis Title: "Alternate User Interfaces for 3D Curve Creation and Manipulation".

Advisor: Ravin Balakrishnan

B.Sc. Honours. Computer Science Major, Math Minor, Philosophy Minor. 2002.

University of Toronto

EMPLOYMENT AND PROFESSIONAL EXPERIENCE

2008 – Present

Distinguished Research Scientist at Autodesk Research, Toronto, Canada.

Group Directors: George Fitzmaurice, Gord Kurtenbach

I am currently working as a Distinguished Research Scientist within the Autodesk Research User Interface Research Group, leading research programs on software learnability, physical learning, and input and interaction for new technologies. These research programs have led to an extensive publication record in top tier international venues. I have also led and influenced the transfer of my research into a number of novel commercial technologies [C.22, C.25, C.65], and new standalone products [C.27, C.61], reaching millions of users worldwide. Finally, my role involves the management of the Autodesk Research Internship program for the User Interface Research Group, annually supervising 3-6 research interns, originating from top Canadian, American, and International institutions.

Jan-Apr 2007

Research Internship at Microsoft Research, Redmond, USA

Research Advisors: Ken Hinckley, Patrick Baudisch. Group Manager: Eric Horvitz

Working within The Adaptive Systems and Interaction group, I designed *Handle Flags*, a new technique used to select and perform commands on ink strokes in pen-operated interfaces. The work was published at the Graphics Interface conference [C.21] and patented by Microsoft.

Jan-Apr 2005

Research Internship at Microsoft Research, Redmond, USA

Research Advisor: Ken Hinckley. Group Manager: Eric Horvitz

This research internship was conducted within The Adaptive Systems and Interaction group. I designed *Hover Widgets*, a new technique for increasing the capabilities of pen-based interfaces, by using short gestures while hovering above the display surface. This work was published in the ACM CHI Conference [C.7] and patented by Microsoft.

2000 - 2001

Undergraduate Research Assistant at Alias|wavefront, Toronto, Canada.

Research Advisors: Gord Kurtenbach, Ravin Balakrishnan, Group Manager: Bill Buxton

Working in the Interactive Graphics Research Group, run by Bill Buxton, I developed a large-display system for the authoring of 2D and 3D curves based on the "tape drawing" interaction commonly used in automotive design. The resulting work led to two peer-reviewed full conference papers, and is often cited for the numerous novel interactions for large screen displays and 3D environments which it introduced [C.1, C.2].

TEACHING AND SUPERVISION

Teaching Experience

Instructor

CSC428/2514: Human-Computer Interaction. Sep-Dec 2007. Grad/Undergrad. University of Toronto.
CSC428/2514: Human-Computer Interaction. Sep-Dec 2006. Grad/Undergrad. University of Toronto.
CSC428/2514: Human-Computer Interaction. Sep-Dec 2005. Grad/Undergrad. University of Toronto.

Teaching Assistant

CSC 236: Introduction to the Theory of Computation. Sep-Dec 2004. Undergrad. University of Toronto.
CSC 236: Introduction to the Theory of Computation. May-Aug 2004. Undergrad. University of Toronto.
CSC 236: Introduction to the Theory of Computation. Sep-Dec 2003. Undergrad. University of Toronto.
CSC 238: Discrete Mathematics for Computer Science. May-Aug 2003. Undergrad. University of Toronto.

Supervision Experience

Post-Docs

2015-2016 Michelle Annett [C.70, C.73]
2014-2015 Rubaiat Habib Kazi [C.64, C.79] (Now full time at Autodesk)

Research Interns

Summer 2016	Ailie Fraser	University of California, San Diego
Summer 2016	Nathaniel Hudson	University of Waterloo
Summer 2016	Rahul Arora	University of Toronto
Summer 2016	David Ledo	University of Calgary
Winter 2016	Seongkook Heo	KAIST
Winter 2016	Barrett Ens	University of Manitoba
Winter 2016	Jun Xing	University of Hong Kong [C.82]
Summer 2015	Raf Ramakers	Hasselt University [C.78]
Summer 2015	Madeline Gannon	Carnegie Mellon University [C.75]
Winter 2015	Haijun Xia	University of Toronto [C.71]
Winter 2015	Barrett Ens	University of Manitoba [C.69]
Summer 2014	Jarrod Knibbe	University of Bristol [C.72]
Summer 2014	Madeline Gannon	Carnegie Mellon University [C.67]
Summer 2014	Fraser Anderson	University of Alberta (Now full time at Autodesk) [C.66]
Winter 2014	Valkyrie Savage	UC Berkeley [C.65]
Summer 2013	Anthony Chen	Carnegie Mellon University [C.60, C.62]
Summer 2013	Rubaiat Habib Kazi	National University of Singapore (Now full time at Autodesk) [C.61]
Summer 2013	Ben Lafreniere	University of Waterloo (Now full time at Autodesk) [C.59]
Winter 2013	Fraser Anderson	University of Alberta (Now full time at Autodesk) [C.54]
Winter 2013	Natalia Bogdan	York University [C.55]
Summer 2012	Tim Chen	National Tsing Hua U. (Now Asst. Professor, U of Technology Sydney) [C.58]
Summer 2012	Ben Lafreniere	University of Waterloo (Now full time at Autodesk) [C.48]
Summer 2012	Nikola Banovic	University of Toronto (Now at Carnegie Melon University) [C.47]
Winter 2012	Xing-Dong Yang	University of Alberta (Now Asst. Professor, Dartmouth College) [C.45]
Winter 2012	Nikola Banovic	University of Toronto (Now at Carnegie Melon University) [C.44]
Summer 2011	Christian Holz	Hasso Plattner Institute (Now at Microsoft Research) [C.42]
Summer 2011	Nikola Banovic	University of Toronto (Now at Carnegie Melon University) [C.39]
Summer 2011	Nicholas Kong	UC Berkeley (Now at Google) [C.29]
Winter 2011	Michelle Annett	University of Alberta (Now at University of Toronto) [C.37]
Winter 2011	Jennifer Fernquist	University of British Columbia (Now at Google) [C.36]
Summer 2010	Parmit Chilana	Univ. of Washington (Now Asst. Professor, Simon Fraser Univ.) [C.29, c.1]
Summer 2010	Xing-Dong Yang	University of Alberta (Now Asst. Professor, Dartmouth College) [C.28]

<i>Winter 2010</i>	Xiaojun Bi	University of Toronto (Now Asst. Professor, Stony Brook University) [C.31]
<i>Summer 2009</i>	Julian Lepinski	Queen's University [C.23]
<i>Summer 2009</i>	Mike Rooke	Queen's University [C.33]
<i>Summer 2009</i>	Hyunyoung Song	University of Maryland (Now at Google) [C.24]
<i>Summer 2008</i>	Hyunyoung Song	University of Maryland (Now at Google) [C.18]

Undergraduate Research Assistants

<i>Summer 2015</i>	Steven Li	University of Waterloo [C.83]
<i>Summer 2008</i>	Jessica Lo	University of Waterloo [C.19]
<i>Summer 2005</i>	Nicholas Kong	University of Toronto [C.14]
<i>Summer 2003</i>	Vikas Jain	University of Toronto [J.1]

PH.D. Supervisory Committees

<i>Current</i>	<i>Anthony Chen, Carnegie Mellon University</i> Member of Supervisory Committee
<i>Current</i>	<i>Madeline Gannon, Carnegie Mellon University</i> Member of Supervisory Committee
<i>2013</i>	<i>Parmit Chilana, University of Washington</i> Member of Supervisory Committee
<i>2012</i>	<i>Mathieu Nancel, Université Paris-Sud XI</i> Ph.D. Defense Jury Member

AWARDS

Graduate Level Awards and Scholarships

<i>2008</i>	<i>Natural Sciences and Engineering Research Council of Canada</i> Post-Doctorate Fellowship (PDF), \$80,000 over two years (declined).
<i>2007</i>	<i>Microsoft Corporation</i> Microsoft Research Fellowship, \$40,000 over two years.
<i>2005</i>	<i>Natural Sciences and Engineering Research Council of Canada</i> Canada Graduate Scholarship (CGS-D) Award for Ph.D. studies, \$70,000 over two years.
<i>2002</i>	<i>Natural Sciences and Engineering Research Council of Canada</i> Postgraduate Scholarship (PGS-A) Award for M.Sc. studies, \$38,000 over two years.

Publication Awards

<i>CHI 2016</i>	<i>Honorable Mention Award (Top 5%)</i> RetroFab: A Design Tool for Retrofitting Physical Interfaces using Actuators, Sensors and 3D Printing
<i>CHI 2016</i>	<i>Best Paper Award (Top 1%)</i> The Effect of Visual Appearance on the Performance of Continuous Sliders and Visual Analogue Scales
<i>CHI 2016</i>	<i>Best Paper Award (Top 1%)</i> Object-Oriented Drawing
<i>CHI 2015</i>	<i>Honorable Mention Award (Top 5%)</i> Tactum: A Skin-Centric Approach to Digital Design and Fabrication.

CHI 2015	<i>Honorable Mention Award (Top 5%)</i> Supporting Subtlety with Deceptive Devices and Illusory Interactions
CHI 2015	<i>Best Talk Award</i> Supporting Subtlety with Deceptive Devices and Illusory Interactions
UIST 2014	<i>Best Talk Award</i> Kitty: Sketching Dynamic and Interactive Illustrations
CHI 2014	<i>Honorable Mention Award (Top 5%)</i> Draco: Bringing Life to Illustrations with Kinetic Textures
CHI 2014	<i>Best Talk Award</i> Draco: Bringing Life to Illustrations with Kinetic Textures
CHI 2014	<i>Best Video Award</i> Draco: Living Illustrations
CHI 2014	<i>Best Paper Award (Top 1%)</i> Duet: Exploring Joint Interactions on a Smart Phone and a Smart Watch
CHI 2014	<i>Best Talk Award</i> Duet: Exploring Joint Interactions on a Smart Phone and a Smart Watch
CHI 2014	<i>Honorable Mention Award (Top 5%)</i> Investigating the Feasibility of Extracting Tool Demonstrations from In-Situ Video Content
IAAI 2014	<i>AAAI Innovative Application Award</i> CommunityCommands: A Software Command Recommender System Case Study
GI 2013	<i>Best Student Paper Award</i> A Model of Navigation for Very Large Data Views
CHI 2011	<i>Honorable Mention Award (Top 5%)</i> Magic Desk: Bringing Multi-Touch Surfaces into Desktop Work
CHI 2010	<i>Honorable Mention Award (Top 5%)</i> ToolClips: An Investigation of Contextual Video Assistance for Functionality Understanding
CHI 2010	<i>Honorable Mention Award (Top 5%)</i> MouseLight: Bimanual Interactions on Digital Paper Using a Pen and a Spatially-Aware Mobile Projector
CHI 2009	<i>Honorable Mention Award (Top 5%)</i> A Survey of Software Learnability: Metrics, Methodologies and Guidelines
CHI 2005	<i>Best Paper Award (Top 1%)</i> The Bubble Cursor: Enhancing Target Acquisition by Dynamic Resizing Of the Cursor's Activation Area
UIST 2004	<i>Best Paper Award (Top 1%)</i> Multi-Finger Gestural Interaction with 3D Volumetric Displays

PUBLICATIONS

Journal Papers

- [J.6] Jonathan Lazar, Elizabeth F. Churchill, **Tovi Grossman**, Gerrit Van der Veer, Philippe Palanque, John “Scooter” Morris, Jen Mankoff. March 2017 - in press. How to Make Computing Conferences, Digital Resources, and ACM SIGs More Inclusive for Individuals with Disabilities. *To Appear in the Communications of the ACM*. 8 Pages.
- [J.5] **Tovi Grossman**, Fanny Chevalier, Rubaiat Habib Kazi. 2016. Bringing research articles to life with animated figures. *ACM Interactions*. 23, 4 (June 2016), 52-57.

- [J.4] **Tovi Grossman** and George Fitzmaurice. 2015. An Investigation of Metrics For the in-situ Detection of Software Expertise. *Human Computer Interaction*. 30, 1 (January 2015), 64-102.
- [J.3] Wei Li, Justin Matejka, **Tovi Grossman**, Joe Konstan and George Fitzmaurice. 2011. Design and Evaluation of a Command Recommendation System for Software Applications. *ACM Transactions on Computer-Human Interaction*. 18, 2 (June 2011), Article 6, 6:1-6:35.
- [J.2] Lode Vanacken, **Tovi Grossman** and Karin Coninx. 2009. Multimodal Selection Techniques for Dense and Occluded 3D Virtual Environments. *International Journal of Human-Computer Studies*. 67, 3 (March 2009), 237-255.
- [J.1] **Tovi Grossman** and Ravin Balakrishnan. 2005. A Probabilistic Approach to Modeling Two-Dimensional Pointing. *ACM Transactions on Computer-Human Interaction*, 12(3). p. 435-459.

Conference Full Papers (Fully Refereed)

- [C.84] Lauren Vasey, Long Nguyen, **Tovi Grossman**, Heather Kerrick, Danil Nagy, Evan Atherton, David Thomasson, Nicholas Cote, Tobias Schwinn, David Benjamin, Maurice Conti, George Fitzmaurice, Achim Menges. 2016. Collaborative Construction: Human and Robot Collaboration Enabling the Fabrication and Assembly of a Filament-Wound Structure. *Proceedings of the 36th Annual Conference of the Association for Computer Aided Design in Architecture*. 184-195.
- [C.83] Benjamin Lafreniere, **Tovi Grossman**, Fraser Anderson, Justin Matejka, Heather Kerrick, Danil Nagy, Lauren Vasey, Evan Atherton, Nicholas Beirne, Marcelo Coelho, Nicholas Cote, Steven Li, Andy Nogueira, Long Nguyen, Tobias Schwinn, James Stoddart, David Thomasson, Ray Wang, Thomas White, David Benjamin, Maurice Conti, Achim Menges, George Fitzmaurice. 2016. Crowdsourced Fabrication. *Proceedings of the ACM UIST Symposium on User Interface Software and Technology*. 15-28.
- [C.82] Jun Xing, Rubaiat Habib, **Tovi Grossman**, Li-Yi Wei, Jos Stam, George Fitzmaurice. 2016. Energy-Brushes: Interactive Tools for Illustrating Stylized Elemental Dynamics. *Proceedings of the ACM UIST Symposium on User Interface Software and Technology*. 755-766.
- [C.81] Xiang 'Anthony' Chen, Jeeun Kim, Jennifer Mankoff, **Tovi Grossman**, Stelian Coros, Scott E. Hudson. 2016. Reprise: A Design Tool for Specifying, Generating, and Customizing 3D Printable Adaptations on Everyday Objects. *Proceedings of the ACM UIST Symposium on User Interface Software and Technology*. 29-39.
- [C.80] Rubaiat Habib, **Tovi Grossman**, Nobuyuki Umetani, George Fitzmaurice. 2016. Motion Amplifiers: Sketching Dynamic Illustrations Using the Principles of 2D Animation. *Proceedings of the ACM CHI Conference on Human Factors in Computing Systems*. 4599-4609.
- [C.79] Rubaiat Habib, **Tovi Grossman**, Cory Mogk, Ryan Schmidt, George Fitzmaurice. 2016. ChronoFab: Fabricating Motion. *Proceedings of the ACM CHI Conference on Human Factors in Computing Systems*. 908-918.
- [C.78] Raf Ramakers, Fraser Anderson, **Tovi Grossman**, George Fitzmaurice. 2016. RetroFab: A Design Tool for Retrofitting Physical Interfaces using Actuators, Sensors and 3D Printing. *Proceedings of the ACM CHI Conference on Human Factors in Computing Systems*. 409-419.
CHI 2016 Best Paper Honorable Mention Award (Top 5%)
- [C.77] Justin Matejka, Michael Glueck, **Tovi Grossman**, George Fitzmaurice. 2016. The Effect of Visual Appearance on the Performance of Continuous Sliders and Visual Analogue Scales. *Proceedings of the ACM CHI Conference on Human Factors in Computing Systems*. 5421-5432.
CHI 2016 Best Paper Award (Top 1%)
- [C.76] Ben Lafreniere, Carl Gutwin, Andy Cockburn, **Tovi Grossman**. 2016. Faster Command Selection on Touchscreen Watches. *Proceedings of the ACM CHI Conference on Human Factors in Computing Systems*. 4663-4674.

- [C.75] Madeline Gannon, **Tovi Grossman**, George Fitzmaurice. 2016. ExoSkin: On-Body Fabrication. *Proceedings of the ACM CHI Conference on Human Factors in Computing Systems*. 5996-6007.
- [C.74] Haijun Xia, Bruno De Araujo, **Tovi Grossman**, Daniel Wigdor. 2016. Object-Oriented Drawing. *Proceedings of the ACM CHI Conference on Human Factors in Computing Systems*. 4610-4621.
CHI 2016 Best Paper Award (Top 1%)
- [C.73] Michelle Annett, Matthew Lakier, Franklin Li, Daniel Wigdor, **Tovi Grossman**, George Fitzmaurice. 2016. The Living Room: Exploring the Haunted and Paranormal to Transform Design and Interaction. *Proceedings of the ACM SIGCHI Conference on Designing Interactive Systems*. 1328-1340.
- [C.72] Jarrod Knibbe, **Tovi Grossman** and George Fitzmaurice. 2015. Smart Makerspace: An Immersive Instructional Space for Physical Tasks. *Proceedings of the ACM International Conference on Interactive Tabletops and Surfaces*. 83-92.
- [C.71] Haijun Xia, **Tovi Grossman** and George Fitzmaurice. 2015. NanoStylus: Enhancing Input on Ultra-Small Displays with a Finger-Mounted Stylus. *Proceedings of the ACM UIST Symposium on User Interface Software and Technology*. 447-456.
- [C.70] Michelle Annett, **Tovi Grossman**, Daniel Wigdor and George Fitzmaurice. 2015. MoveableMaker: Facilitating the Design, Generation, and Assembly of Moveable Papercraft. *Proceedings of the ACM UIST Symposium on User Interface Software and Technology*. 565-574.
- [C.69] Barrett Ens, **Tovi Grossman**, Fraser Anderson, Justin Matejka and George Fitzmaurice. 2015. Candid Interaction: Revealing Hidden Mobile and Wearable Computing Activities. *Proceedings of the ACM UIST Symposium on User Interface Software and Technology*. 467-476.
- [C.68] **Tovi Grossman**, Xiang Anthony Chen and George Fitzmaurice. 2015. Typing on Glasses: Adapting Text Entry to Smart Eyewear. *Proceedings of the ACM MobileHCI Conference on Human-Computer Interaction with Mobile Devices and Services*. 144-152.
- [C.67] Madeline Gannon, **Tovi Grossman** and George Fitzmaurice. 2015. Tactum: A Skin-Centric Approach to Digital Design and Fabrication. *Proceedings of the ACM CHI 2015 Conference on Human Factors in Computing Systems*. 1779-1788. [23% Acceptance Rate]
CHI 2015 Best Paper Honorable Mention Award (Top 5%)
- [C.66] Fraser Anderson, **Tovi Grossman**, Daniel Wigdor and George Fitzmaurice. 2015. Supporting Subtlety with Deceptive Devices and Illusory Interactions. *Proceedings of the ACM CHI 2015 Conference on Human Factors in Computing Systems*. 1489-1498. [23% Acceptance Rate]
CHI 2015 Best Paper Honorable Mention Award (Top 5%)
CHI 2015 Best Talk Award
- [C.65] Valkyrie Savage, Ryan Schmidt, **Tovi Grossman**, George Fitzmaurice and Björn Hartmann. 2014. A Series of Tubes: Adding Interactivity to 3D Prints Using Internal Pipes. *Proceedings of the ACM UIST Symposium on User Interface Software and Technology*. 3-12. [22% Acceptance Rate]
- [C.64] Rubaiat Habib, Fanny Chevalier, **Tovi Grossman** and George Fitzmaurice. 2014. Kitty: Sketching Dynamic and Interactive Illustrations. *Proceedings of the ACM UIST Symposium on User Interface Software and Technology*. 395-405. [22% Acceptance Rate]
UIST 2014 Best Talk Award
- [C.63] Justin Matejka, **Tovi Grossman** and George Fitzmaurice. 2014. Video Lens: Rapid Playback and Exploration of Large Video Collections and Associated Metadata. *Proceedings of the ACM UIST Symposium on User Interface Software and Technology*. 541-500. [22% Acceptance Rate]

- [C.62] Xiang Anthony Chen, **Tovi Grossman** and George Fitzmaurice. 2014. Swipeboard: A Text Entry Technique for Ultra-Small Devices That Supports Novice to Expert Transitions. *Proceedings of the ACM UIST Symposium on User Interface Software and Technology*. 615-620. [22% Acceptance Rate]
- [C.61] Rubaiat Habib, Fanny Chevalier, **Tovi Grossman**, Shengdong Zhao and George Fitzmaurice. 2014. Draco: Bringing Life to Illustrations with Kinetic Textures. *Proceedings of the ACM CHI Conference on Human Factors in Computing Systems*. 351-360. [23% Acceptance Rate]
CHI 2014 Best Paper Honorable Mention Award (Top 5%)
CHI 2014 Best Video Award
CHI 2014 Best Talk Award
SIGGRAPH 2014 Studio Project
- [C.60] Xiang Anthony Chen, **Tovi Grossman**, Daniel Wigdor and George Fitzmaurice. 2014. Duet: Exploring Joint Interactions on a Smart Phone and a Smart Watch. *Proceedings of the ACM CHI Conference on Human Factors in Computing Systems*. 159-168. [23% Acceptance Rate]
CHI 2014 Best Paper Award (Top 1%)
CHI 2014 Best Talk Award
- [C.59] Ben Lafreniere, **Tovi Grossman**, Justin Matejka and George Fitzmaurice. 2014. Investigating the Feasibility of Extracting Tool Demonstrations from In-Situ Video Content. *Proceedings of the ACM CHI Conference on Human Factors in Computing Systems*. 4007-4016. [23% Acceptance Rate]
CHI 2014 Best Paper Honorable Mention Award (Top 5%)
- [C.58] Hsiang-Ting (Tim) Chen, **Tovi Grossman**, Ryan Schmidt, Björn Hartmann, George Fitzmaurice and Maneesh Agrawala. 2014. History Assisted View Authoring for 3D Models. *Proceedings of the ACM CHI Conference on Human Factors in Computing Systems*. 2027-2036. [23% Acceptance Rate]
- [C.57] Wei Li, **Tovi Grossman** and George Fitzmaurice. 2014. CADament: A Gamified Multiplayer Software Tutorial System. *Proceedings of the ACM CHI Conference on Human Factors in Computing Systems*. 3369-3378. [23% Acceptance Rate]
- [C.56] Wei Li, Justin Matejka, **Tovi Grossman** and George Fitzmaurice. 2014. Deploying CommunityCommands: A Software Command Recommender System Case Study. *Proceedings of the IAAI Conference on Innovative Applications of Artificial Intelligence*. 2922-2929. [One of Seven Selected]
IAAI 2014 Innovative Application Award
- [C.55] Natalia Bogdan, **Tovi Grossman** and George Fitzmaurice. 2014. HybridSpace: Integrating 3D Freehand Input and Stereo Viewing into Traditional Desktop Applications. *Proceedings of the IEEE 3DUI Symposium on 3D User Interfaces*. 51-58. [20% Acceptance Rate]
- [C.54] Fraser Anderson, **Tovi Grossman**, Justin Matejka and George Fitzmaurice. 2013. YouMove: Enhancing Movement Training with an Augmented Reality Mirror. *Proceedings of the ACM UIST Symposium on User Interface Software and Technology*. 311-320. [20% Acceptance Rate]
- [C.53] Sylvain Malacria, Joey Scarr, Andy Cockburn, Carl Gutwin and **Tovi Grossman**. 2013. Skillometers: Reflective Widgets that Motivate and Help Users to Improve Performance. *Proceedings of the ACM UIST Symposium on User Interface Software and Technology*. 321-330. [23% Acceptance Rate]
- [C.52] Michael Glueck, **Tovi Grossman** and Daniel Wigdor. 2013. A Model of Navigation for Very Large Data Views. *Proceedings of the Graphics Interface Conference*. 8 pages. [33% Acceptance Rate]
GI 2013 Best Student Paper Award
- [C.51] Abhijit Karnik, **Tovi Grossman** and Sriram Subramanian. 2013. Comparison of User Performance in Mixed 2D-3D Multi-Display Environments. *Proceedings of the IFIP Conference on Human-Computer Interaction*. 260-277. [31% Acceptance Rate]

- [C.50] Justin Matejka, **Tovi Grossman** and George Fitzmaurice. 2013. Swifter: Improved Online Video Scrubbing. *Proceedings of the ACM CHI Conference on Human Factors in Computing Systems*. 1159-1168. [20% Acceptance Rate]
- [C.49] Justin Matejka, **Tovi Grossman** and George Fitzmaurice. 2013. Patina: Dynamic Heatmaps for Visualizing Application Usage. *Proceedings of the ACM CHI Conference on Human Factors in Computing Systems*. 3227-3236. [20% Acceptance Rate]
- [C.48] Ben Lafreniere, **Tovi Grossman** and George Fitzmaurice. 2013. Community Enhanced Tutorials: Improving Tutorials with Multiple Demonstrations. *Proceedings of the ACM CHI Conference on Human Factors in Computing Systems*. 1779-1788. [20% Acceptance Rate]
- [C.47] Nikola Banovic, **Tovi Grossman** and George Fitzmaurice. 2013. The Effect of Time-based Cost of Error in Target-directed Pointing Tasks. *Proceedings of the ACM CHI Conference on Human Factors in Computing Systems*. 1373-1382. [20% Acceptance Rate]
- [C.46] Parmit K. Chilana, Andrew J. Ko, Jacob O. Wobbrock and **Tovi Grossman**. 2013. A Multi-Site Field Study of Crowdsourced Contextual Help: Usage and Perspectives of End-Users and Software Teams. *Proceedings of the ACM CHI Conference on Human Factors in Computing Systems*. 217-226. [20% Acceptance Rate]
- [C.45] Xing-Dong Yang, **Tovi Grossman**, Daniel Wigdor and George Fitzmaurice. 2012. Magic Finger: Always-Available Input through Finger Instrumentation. *Proceedings of the ACM UIST Symposium on User Interface Software and Technology*. 147-156. [22% Acceptance Rate]
- [C.44] Nikola Banovic, **Tovi Grossman**, Justin Matejka and George Fitzmaurice. 2012. Waken: Reverse Engineering Usage Information and Interface Structure from Software Videos. *Proceedings of the ACM UIST Symposium on User Interface Software and Technology*. 83-92. [22% Acceptance Rate]
- [C.43] Wei Li, **Tovi Grossman** and George Fitzmaurice. 2012. GamiCAD: A Gamified Tutorial System for First Time AutoCAD Users. *Proceedings of the ACM UIST Symposium on User Interface Software and Technology*. 1103-1112. [22% Acceptance Rate]
- [C.42] Christian Holz, **Tovi Grossman**, George Fitzmaurice and Anne Agur. 2012. Implanted User Interfaces. *Proceedings of the ACM CHI Conference on Human Factors in Computing Systems*. 503-512. [23% Acceptance Rate]
- [C.41] Justin Matejka, **Tovi Grossman** and George Fitzmaurice. 2012. Swift: Reducing the Effects of Latency in Online Video Scrubbing. *Proceedings of the ACM CHI Conference on Human Factors in Computing Systems*. 637-646. [23% Acceptance Rate]
- [C.40] Nicholas Kong, **Tovi Grossman**, Björn Hartmann, George Fitzmaurice and Maneesh Agrawala. 2012. Delta: A Tool for Representing and Comparing Workflows. *Proceedings of the ACM CHI Conference on Human Factors in Computing Systems*. 1027-1036. [23% Acceptance Rate]
- [C.39] Nikola Banovic, Fanny Chevalier, **Tovi Grossman** and George Fitzmaurice. 2012. Triggering Triggers and Burying Barriers to Customizing Software. *Proceedings of the ACM CHI Conference on Human Factors in Computing Systems*. 2717-2726. [23% Acceptance Rate]
- [C.38] Justin Matejka, **Tovi Grossman** and George Fitzmaurice. 2011. IP-QAT: In-Product Questions, Answers and Tips. *Proceedings of the ACM UIST Symposium on User Interface Software and Technology*. 175-184. [26% Acceptance Rate]
- [C.37] Michelle Annett, **Tovi Grossman**, Daniel Wigdor and George Fitzmaurice. 2011. Medusa: A Proximity-Aware Multi-touch Tabletop. *Proceedings of the ACM UIST Symposium on User Interface Software and Technology*. 337-346. [26% Acceptance Rate]

- [C.36] Jennifer Fernquist, **Tovi Grossman** and George Fitzmaurice. 2011. Sketch-Sketch Revolution: An Engaging Tutorial System for Guided Sketching and Application Learning. *Proceedings of the ACM UIST Symposium on User Interface Software and Technology*. 373-382. [26% Acceptance Rate]
- [C.35] Michael Ekstrand, Wei Li, **Tovi Grossman**, Justin Matejka and George Fitzmaurice. 2011. Searching for Software Learning Resources using Application Context. *Proceedings of the ACM UIST Symposium on User Interface Software and Technology*. 195-204. [26% Acceptance Rate]
- [C.34] Wei Li, **Tovi Grossman**, Justin Matejka and George Fitzmaurice. 2011. TwitApp: In-product Micro-Blogging for Design Sharing. *Proceedings of the ACM UIST Symposium on User Interface Software and Technology*. 185-194. [26% Acceptance Rate]
- [C.33] Michael Rooke, **Tovi Grossman** and George Fitzmaurice. 2011. AppMap: Exploring User Interface Visualizations. *Proceedings of Graphics Interface 2011*. 111-118. [32% Acceptance Rate]
- [C.32] Justin Matejka, **Tovi Grossman** and George Fitzmaurice. 2011. Ambient Help. *Proceedings of the ACM CHI Conference on Human Factors in Computing Systems*. 2751-2760. [27% Acceptance Rate]
- [C.31] Xiaojun Bi, **Tovi Grossman**, Justin Matejka and George Fitzmaurice. 2011. Magic Desk: Bringing Multi-Touch Surfaces into Desktop Work. *Proceedings of the ACM CHI Conference on Human Factors in Computing Systems*. 2511-2520. [27% Acceptance Rate]
CHI 2011 Best Paper Honorable Mention Award (Top 5%)
- [C.30] Khalad Hassan, **Tovi Grossman** and Pourang Irani. 2011. Comet and Target Ghost: Techniques for Selecting Moving Targets. *Proceedings of the ACM CHI Conference on Human Factors in Computing Systems*. 839-848. [27% Acceptance Rate]
- [C.29] Parmit Chilana, **Tovi Grossman** and George Fitzmaurice. 2011. Modern Software Product Support Processes and the Usage of Multimedia Formats. *Proceedings of the ACM CHI Conference on Human Factors in Computing Systems*. 3093-3102. [27% Acceptance Rate]
- [C.28] Xing-Dong Yang, **Tovi Grossman**, Pourang Irani and George Fitzmaurice. 2011. TouchCuts and TouchZoom: Enhanced Target Selection for Touch Displays using Finger Proximity Sensing. *Proceedings of the ACM CHI Conference on Human Factors in Computing Systems*. 2585-2594. [27% Acceptance Rate]
- [C.27] **Tovi Grossman**, Justin Matejka and George Fitzmaurice. 2010. Chronicle: Capture, Exploration, and Playback Of Document Workflow Histories. *Proceedings of ACM UIST Symposium on User Interface Software and Technology*. 143-152. [18% Acceptance Rate]
- [C.26] James McCrae, Michael Glueck, **Tovi Grossman**, Azam Khan and Karan Singh. 2010. Exploring the Design Space of Multiscale 3D Orientation. *Proceedings of the International Conference on Advanced Visual Interfaces*. 81-88. [20% Acceptance Rate]
- [C.25] **Tovi Grossman** and George Fitzmaurice. 2010. ToolClips: An Investigation of Contextual Video Assistance for Functionality Understanding. *Proceedings of the ACM CHI Conference on Human Factors in Computing Systems*. 1515-1524. [22% Acceptance Rate]
CHI 2010 Best Paper Honorable Mention Award (Top 5%)
- [C.24] Hyunyoung Song, Francois Guimbretiere, **Tovi Grossman** and George Fitzmaurice. 2010. MouseLight: Bimanual Interactions on Digital Paper Using a Pen and a Spatially-Aware Mobile Projector. *Proceedings of the ACM CHI Conference on Human Factors in Computing Systems*. 2451-2460. [22% Acceptance Rate]
CHI 2010 Best Paper Honorable Mention Award (Top 5%)
- [C.23] G. Julian Lepinski, **Tovi Grossman** and George Fitzmaurice. 2010. The Design and Evaluation of Multitouch Marking Menus. *Proceedings of the ACM CHI Conference on Human Factors in Computing Systems*. 2233-2242. [22% Acceptance Rate]

- [C.22] Justin Matejka, Wei Li, **Tovi Grossman** and George Fitzmaurice. 2009. CommunityCommands: Command Recommendations for Software Applications. *Proceedings of the ACM UIST Symposium on User Interface Software and Technology*. 193-202. [18% Acceptance Rate]
- [C.21] **Tovi Grossman**, Patrick Baudisch and Ken Hinckley. 2009. Handle Flags: Efficient And Flexible Selections For Inking Applications. *Proceedings of Graphics Interface 2009*. 167-174. [36% Acceptance Rate]
- [C.20] **Tovi Grossman**, George Fitzmaurice and Ramtin Attar. 2009. A Survey of Software Learnability: Metrics, Methodologies and Guidelines. *Proceedings of the ACM CHI Conference on Human Factors in Computing Systems*. 649-658. [25% Acceptance Rate]
CHI 2009 Best Paper Honorable Mention Award (Top 5%)
- [C.19] Justin Matejka, **Tovi Grossman**, Jessica Lo and George Fitzmaurice. 2009. The Design and Evaluation of Multi-Finger Mouse Emulation Techniques. *Proceedings of the ACM CHI Conference on Human Factors in Computing Systems*. 1073-1082. [25% Acceptance Rate]
- [C.18] Hyunyoung Song, **Tovi Grossman**, George Fitzmaurice, Francois Guimbretiere, Azam Khan, Ramtin Attar and Gordon Kurtenbach. 2009. Penlight: Combining a Mobile Projector and a Digital Pen for Dynamic Visual Overlay. *Proceedings of the ACM CHI Conference on Human Factors in Computing Systems*. 143-152. [25% Acceptance Rate]
- [C.17] **Tovi Grossman** and Ravin Balakrishnan. 2008. Collaborative Interaction With Volumetric Displays. *Proceedings of the ACM CHI Conference on Human Factors in Computing Systems*. 383-392. [22% Acceptance Rate]
- [C.16] **Tovi Grossman** and Daniel Wigdor. 2007. Going Deeper: A Taxonomy of 3D on the Tabletop. *Proceedings of IEEE TableTop International Workshop on Horizontal Interactive Human-Computer Systems*. 137-144.
- [C.15] **Tovi Grossman**, Daniel Wigdor and Ravin Balakrishnan. 2007. Exploring and Reducing the Effects of Orientation on Text Readability in Volumetric Displays. *Proceedings of the ACM CHI Conference on Human Factors in Computing Systems*. 483-492. [22% Acceptance Rate]
- [C.14] **Tovi Grossman**, Nicholas Kong and Ravin Balakrishnan. 2007. Modeling Pointing At Targets of Arbitrary Shapes. *Proceedings of the ACM CHI Conference on Human Factors in Computing Systems*. 463-472. [22% Acceptance Rate]
- [C.13] **Tovi Grossman**, Pierre Dragicevic and Ravin Balakrishnan. 2007. Strategies for Accelerating On-Line Learning of Hotkeys. *Proceedings of the ACM CHI Conference on Human Factors in Computing Systems*. 1591-1600. [22% Acceptance Rate]
- [C.12] Jeremy Birnholtz, **Tovi Grossman**, Clarissa Mak and Ravin Balakrishnan. 2007. An Exploratory Study of Input Configuration and Group Process in a Negotiation Task Using a Large Display. *Proceedings of the ACM CHI Conference on Human Factors in Computing Systems*. 91-100. [22% Acceptance Rate]
- [C.11] Raghavendra Kattinakere, **Tovi Grossman** and Sriram Subramanian. 2007. Modeling Steering Within Above-The-Surface Interaction Layers. *Proceedings of the ACM CHI Conference on Human Factors in Computing Systems*. 317-326. [22% Acceptance Rate]
- [C.10] Lode Vanacken, **Tovi Grossman** and Karin Coninx. 2007. Exploring the Effects of Environment Density and Target Visibility on Object Selection in 3D Virtual Environments. *Proceedings of the IEEE 3DUI Symposium on 3D User Interfaces*. p. 117-124. [22% Acceptance Rate]
- [C.9] **Tovi Grossman** and Ravin Balakrishnan. 2006. The Design and Evaluation of Selection Techniques for 3D Volumetric Displays. *Proceedings of the ACM UIST 2006 Symposium on User Interface Software and Technology*. 3-12. [20% Acceptance Rate]

- [C.8] **Tovi Grossman** and Ravin Balakrishnan. 2006. An Evaluation of Depth Perception on Volumetric Displays. *Proceedings the AVI Working Conference on Advanced Visual Interfaces*. p. 193-200. [25% Acceptance Rate]
- [C.7] **Tovi Grossman**, Ken Hinckley, Patrick Baudisch, Maneesh Agrawala and Ravin Balakrishnan. 2006. Hover Widgets: Using the Tracking State to Extend the Capabilities of Pen-Operated Devices. *Proceedings of the ACM CHI Conference on Human Factors in Computing Systems*. 861-870. [24% Acceptance Rate]
- [C.6] **Tovi Grossman** and Ravin Balakrishnan. 2005. The Bubble Cursor: Enhancing Target Acquisition By Dynamic Resizing Of The Cursor's Activation Area. *Proceedings of the ACM CHI Conference on Human Factors in Computing Systems*. 281-290. [25% Acceptance Rate]
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- [C.5] **Tovi Grossman**, Daniel Wigdor and Ravin Balakrishnan. 2004. Multi-Finger Gestural Interaction with 3D Volumetric Displays. *Proceedings of the ACM UIST 2004 Symposium on User Interface Software and Technology*. 61-70. [21% Acceptance Rate]
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- [C.4] **Tovi Grossman** and Ravin Balakrishnan. 2004. Pointing At Trivariate Targets in 3D Environments. *Proceedings of the ACM CHI Conference on Human Factors in Computing Systems*. 447-454. [16% Acceptance Rate]
- [C.3] **Tovi Grossman**, Ravin Balakrishnan and Karan Singh. 2003. An Interface For Creating And Manipulating Curves Using A High Degree-Of-Freedom Input Device. *Proceedings of the ACM CHI Conference on Human Factors in Computing Systems*. 185-192. [16% Acceptance Rate]
- [C.2] **Tovi Grossman**, Ravin Balakrishnan, Gordon Kurtenbach, George W. Fitzmaurice, Azam Khan and William Buxton. 2002. Creating Principal 3D Curves with Digital Tape Drawing. *Proceedings of the ACM CHI Conference on Human Factors in Computing Systems*. 121-128. [15% Acceptance Rate]
- [C.1] **Tovi Grossman**, Ravin Balakrishnan, Gordon Kurtenbach, George W. Fitzmaurice, Azam Khan and William Buxton. 2001. Interaction Techniques for 3D Modeling On Large Displays. *Proceedings of ACM I3D 2001 Symposium on Interactive 3D Graphics*. 17-23. [20% Acceptance Rate]

Conference Short Papers (Fully Refereed)

- [c.2] Xiaole Kuang, Bo Yi, Shengdong Zhao, Jianann Chow, **Tovi Grossman** and George Fitzmaurice. 2012. A Classification of Opening Posts in Commercial Software Help Forums. *Proceedings of the 10th Asia Pacific Conference on Computer Human Interaction*. ACM, New York, NY, USA. 4 pages. [23% Acceptance Rate]
- [c.1] Parmit Chilana, Andrew Ko, Jacob Wobbrock, **Tovi Grossman** and George Fitzmaurice. 2011. Post-Deployment Usability: A Survey of Current Practices. *Proceedings of the ACM CHI Conference on Human Factors in Computing Systems*. 2243-2246. [27% Acceptance Rate]

Book Chapters

- [B.2] Christian Holz, **Tovi Grossman**, George Fitzmaurice and Anne Agur. 2014. Interaction with Implanted Devices through Implanted User Interfaces. In *Implantable Bioelectronics*. Evgeny Katz (ed.). Wiley. ISBN: 978-3-527-33525-1.
- [B.1] **Tovi Grossman** and Daniel Wigdor. 2010. On, Above, and Beyond: Taking Tabletops to the Third Dimension. In *Tabletops - Horizontal Interactive Displays*. Christian Mueller-Tomfelde (ed.). Springer. ISBN: 978-1-84996-112-7.

Extended Abstract (Non-Refereed)

- [ea.5] Lauren Vasey, **Tovi Grossman**, Heather Kerrick, and Danil Nagy. 2016. The hive: a human and robot collaborative building process. In *ACM SIGGRAPH 2016 Talks*. ACM, New York, NY, USA, Article 83, 2 pages.
- [ea.4] Rubaiat Habib Kazi, **Tovi Grossman**, Nobuyuki Umetani, and George Fitzmaurice. 2016. SKUID: sketching dynamic drawings using the principles of 2D animation. In *ACM SIGGRAPH 2016 Talks*. ACM, New York, NY, USA, Article 84, 1 page.
- [ea.3] **Tovi Grossman**, Fanny Chevalier & Rubaiat Habib. 2015. Your Paper is Dead! Bringing Life to Research Articles with Animated Figures. In *Proceedings of the ACM Extended Abstracts on Human Factors in Computing Systems*. ACM, New York, NY, USA. 10 pages.
- [ea.2] Parmit Chilana, Mary Czerwinski, **Tovi Grossman**, Chris Harrison, Ranjitha Kumar, Tapan Parikh, Shumin Zhai. 2015. Technology Transfer of HCI Research Innovations: Challenges and Opportunities. In *Proceedings of the ACM Extended Abstracts on Human Factors in Computing Systems*. ACM, New York, NY, USA. 6 pages.
- [ea.1] Rubaiat Habib Kazi, Fanny Chevalier, **Tovi Grossman**, Shengdong Zhao, and George Fitzmaurice. 2014. DRACO: sketching animated drawings with kinetic textures. In *ACM SIGGRAPH 2014 Studio*. ACM, New York, NY, USA, Article 34, 1 page.

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- [P.59] Animating Sketches via Kinetic Textures. Rubaiat Habib, Fanny Chevalier, **Tovi Grossman**, Shengdong Zhao and George Fitzmaurice. Filed 11/20/2014. (Pending)
- [P.58] Technique for Searching and Viewing Video Material. Justin Matejka, **Tovi Grossman** and George Fitzmaurice. Filed 10/27/2014. (Pending)
- [P.57] Recommendation System for Protecting User Privacy. Wei Li, Justin Matejka, **Tovi Grossman** and George Fitzmaurice. Filed 07/16/2014. (Pending)
- [P.56] A Series Of Tubes: Adding Interactivity to 3D Prints Using Internal Pipes. Valkyrie Savage, Ryan Schmidt, **Tovi Grossman**, George Fitzmaurice and Björn Hartmann. Filed 06/20/2014. (Pending)
- [P.55] Kitty: Sketching Dynamic and Interactive Illustrations. Rubaiat Habib, Fanny Chevalier, **Tovi Grossman** and George Fitzmaurice. Filed 06/20/2014. (Pending)
- [P.54] Method for Using Metadata-Based Sports Video Exploration. Justin Matejka, **Tovi Grossman** and George Fitzmaurice. Filed 03/24/2014. (Pending)
- [P.53] Cut-Away Stereo Widgets. Natalia Bogdan, **Tovi Grossman** and George Fitzmaurice. Filed 02/14/2014. (Pending)
- [P.52] Flip-Up Stereo Glasses. Natalia Bogdan, **Tovi Grossman** and George Fitzmaurice. Filed 02/14/2014. (Pending)
- [P.51] Animated Transitions between 2D and 3D Stereo. Natalia Bogdan, **Tovi Grossman** and George Fitzmaurice. Filed 02/13/2014. (Pending)
- [P.50] HybridSpace: Integrating 3D Freehand Input and Stereo Viewing into Traditional Desktop Applications. Natalia Bogdan, **Tovi Grossman** and George Fitzmaurice. Filed 02/13/2014. (Pending)
- [P.49] Developing Software Tool Demonstrations From Actual User Implementations. Ben Lafreniere, **Tovi Grossman**, Justin Matejka and George Fitzmaurice. Filed 12/04/2013. (Pending)

- [P.48] Duet: Exploring Joint Interactions on a Smart Phone and a Smart Watch. Xiang Anthony Chen, **Tovi Grossman**, Daniel Wigdor and George Fitzmaurice. Filed 12/04/2013. (Pending)
- [P.47] Swipeboard: A Text Entry Technique for Ultra-Small Devices That Supports Novice to Expert Transitions. Xiang Anthony Chen, **Tovi Grossman** and George Fitzmaurice. Filed 12/04/2013. (Pending)
- [P.46] Techniques For Showcasing 3D Models. Hsiang-Ting (Tim) Chen, **Tovi Grossman**, Ryan Schmidt, Björn Hartmann, George Fitzmaurice and Maneesh Agrawala. Filed 12/04/2013. (Pending)
- [P.45] Content Forager - Techniques for Viewing and Searching Different Types of Content. Justin Matejka, **Tovi Grossman** and George Fitzmaurice. Filed 12/03/2013. (Pending)
- [P.44] Reflection Selection: Target Selection on Large Display with Zero Latency Feedback. Fraser Anderson, **Tovi Grossman**, Justin Matejka and George Fitzmaurice. Filed 10/03/2013. (Pending)
- [P.43] YouMove: Enhancing Movement Training With an Augmented Reality Mirror. Fraser Anderson, **Tovi Grossman**, Justin Matejka and George Fitzmaurice. Filed 10/03/2013. (Pending)
- [P.42] Always-Available Input Through Finger Instrumentation. Xing-Dong Yang, **Tovi Grossman**, Daniel Wigdor and George Fitzmaurice. Filed 10/02/2013. (Pending)
- [P.41] Adapting Video Annotations to Playback Speed. George Fitzmaurice, **Tovi Grossman** and Justin Matejka. Filed 07/25/2013. (Pending)
- [P.40] Server-Side Video Screen Capture. **Tovi Grossman** and George Fitzmaurice. Filed 04/26/2013. (Pending)
- [P.39] Community Enhanced Tutorials: Improving Tutorials with Multiple Demonstrations. Ben Lafreniere, **Tovi Grossman** and George Fitzmaurice. Filed 04/16/2013. (Pending)
- [P.38] Real-Time Scrubbing of Videos Using a Two-Dimensional Grid of Thumbnail Images. Justin Matejka, **Tovi Grossman** and George Fitzmaurice. Filed 04/10/2013. (Pending)
- [P.37] Generating Informative Viewpoints Based on Editing History. Hsiang-Ting (Tim) Chen, **Tovi Grossman**, Ryan Schmidt, Björn Hartmann, George Fitzmaurice and Maneesh Agrawala. Filed 03/13/2013. (Pending)
- [P.36] Implanted Devices and Related User Interfaces. Christian Holz, **Tovi Grossman**, George Fitzmaurice and Anne Agur. Filed 12/14/2012. (Pending)
- [P.35] Web-Based System for Capturing and Sharing Instructional Material for a Software Application. **Tovi Grossman**, George Fitzmaurice, Justin Frank Matejka, Thomas White, Ara Danielyan, Ruslana Steininger, Michael Chen and Anderson Nogueira. Filed 11/27/2012. (Pending)
- [P.34] Computer-Implemented Tutorial for Visual Manipulation Software. Jennifer Fernquist, **Tovi Grossman** and George Fitzmaurice. Filed 10/12/2012. (Pending)
- [P.33] Proximity-Aware Multi-Touch Tabletop. Justin Matejka, **Tovi Grossman** and George Fitzmaurice. Filed 10/12/2012. (Pending)
- [P.32] Real-Time Scrubbing of On-Line Videos. Justin Matejka, **Tovi Grossman** and George Fitzmaurice. (Pending)
- [P.31] In-Product Questions, Answers, and Tips. Justin Matejka, **Tovi Grossman** and George Fitzmaurice. Filed 10/11/2012. (Pending)
- [P.30] Displaying Resources Based on Shared Contexts. George Fitzmaurice, **Tovi Grossman**, Justin Frank Matejka and Wei Li. Filed 09/05/2012. Issued 05/06/2014. **Patent No. US8719204.**

- [P.29] Systems and Methods for Visualizing Relationships between Publications. Justin Matejka, **Tovi Grossman** and George Fitzmaurice. Filed 06/21/2012. (Pending)
- [P.28] Delta: A Tool for Representing and Comparing Workflows. Nicholas Kong, **Tovi Grossman**, Björn Hartmann, George Fitzmaurice and Maneesh Agrawala. Filed 05/02/2012. (Pending)
- [P.27] Enhanced Target Selection for a Touch-Based Input Enabled User Interface. Xing-Dong Yang, **Tovi Grossman**, Pourang Irani and George Fitzmaurice. Filed 10/14/2011. (Pending)
- [P.26] In-Product Micro-Blogging for Design Sharing. Wei Li, **Tovi Grossman**, Justin Matejka and George Fitzmaurice. Filed 10/13/2011. (Pending)
- [P.25] Appmap: Visualizing User Interfaces. Michael Rooke, **Tovi Grossman** and George Fitzmaurice. Filed 09/01/2011. (Pending)
- [P.24] Hierarchical Display and Navigation of Document Revision Histories. **Tovi Grossman**, Justin Matejka and George Fitzmaurice. Filed 04/19/2011. Issued 09/10/2013. **Patent No. US8533593.**
- [P.23] Hierarchical Display and Navigation of Document Revision Histories. **Tovi Grossman**, Justin Matejka and George Fitzmaurice. Filed 04/19/2011. Issued 09/10/2013. **Patent No. US8533594.**
- [P.22] Hierarchical Display and Navigation of Document Revision Histories. **Tovi Grossman**, Justin Matejka and George Fitzmaurice. Filed 04/19/2011. Issued 09/10/2013. **Patent No. US8533595.**
- [P.21] Hierarchical Display and Navigation of Document Revision Histories. **Tovi Grossman**, Justin Matejka and George Fitzmaurice. Issued 04/15/2014. **Patent No. US8701002.**
- [P.20] Hierarchical Display and Navigation of Document Revision Histories. **Tovi Grossman**, Justin Matejka and George Fitzmaurice. Filed 04/19/2011. Issued 10/28/2014. **Patent No. US8874525.**
- [P.19] Method of Providing Instructional Material While a Software Application is in Use. Justin Matejka, **Tovi Grossman** and George Fitzmaurice. Filed 04/08/2011. Issued 09/17/2013. **Patent No. US8538947.**
- [P.18] Context-Aware Search: Searching for Software Learning Resources Using Application Context. Michael Ekstrand, Wei Li, **Tovi Grossman**, Justin Matejka and George Fitzmaurice. Filed 03/16/2011. Issued 06/17/2014. **Patent No. US8756223.**
- [P.17] Bimanual Interactions on Digital Paper Using a Pen and a Spatially-Aware Mobile Projector. Hyunyoung Song, Francois Guimbretiere, **Tovi Grossman** and George Fitzmaurice. Filed 03/03/2011. (Pending)
- [P.16] Multi-Touch Integrated Desktop Environment. Xiaojun Bi, **Tovi Grossman**, Justin Matejka and George Fitzmaurice. (Pending)
- [P.15] DataTips: Method and System for Providing Data-Related Information and Videos to Software Application End-Users. **Tovi Grossman** and George Fitzmaurice. Filed 10/25/2010. (Pending)
- [P.14] System for Providing Software Application End-Users with Contextual Access to Text and Video Instructional Information. **Tovi Grossman** and George Fitzmaurice. Filed 08/03/2010. (Pending)
- [P.13] Multi-Touch Marking Menus and Directional Chording Gestures. G. Julian Lepinski, **Tovi Grossman** and George Fitzmaurice. Filed 03/26/2010. (Pending)
- [P.12] A Spatially-Aware Projection Pen. Hyunyoung Song, **Tovi Grossman**, George Fitzmaurice, Francois Guimbretiere and Gordon Kurtenbach. Filed 08/06/2009. (Pending)

- [P.11] A Spatially-Aware Projection Pen Display. Hyunyoung Song, **Tovi Grossman**, George Fitzmaurice, Francois Guimbretiere and Gordon Kurtenbach. Filed 08/06/2009. (Pending)
- [P.10] A Spatially-Aware Projection Pen Interface. Hyunyoung Song, **Tovi Grossman**, George Fitzmaurice, Francois Guimbretiere and Gordon Kurtenbach. Filed 08/06/2009. Issued 11/11/2014. **Patent No. US8884876.**
- [P.9] Multi-Finger Mouse Emulation. Justin Matejka, **Tovi Grossman**, Jessica Lo and George Fitzmaurice. Filed 06/29/2009. Issued 06/11/2013. **Patent No. US8462134.**
- [P.8] Displaying Resources Based on Shared Contexts. George Fitzmaurice, **Tovi Grossman**, Justin Frank Matejka and Wei Li. Filed 04/28/2009. Issued 04/17/2012. **Patent No. US8160983.**
- [P.7] Displaying Resources Based on Shared Contexts. George Fitzmaurice, **Tovi Grossman**, Justin Frank Matejka and Wei Li. Filed 04/28/2009. Issued 09/18/2012. **Patent No. US8271410B2.**
- [P.6] Parallel Computation of Computationally Expensive Parameter Changes. Jeff Kowalski, Mark Davis, Jose Madeira De Freitas Garcia, **Tovi Grossman** and George Fitzmaurice. Filed 03/24/2009. Issued 08/21/2012. **Patent No. US8248428.**
- [P.5] Manual and Automatic Techniques for Finding Similar Users. George Fitzmaurice, **Tovi Grossman**, Justin Frank Matejka and Wei Li. Filed 03/06/2009. Issued 07/03/2012. **Patent No. US8214375.**
- [P.4] Handle Flags. **Tovi Grossman**, Patrick Baudisch and Ken Hinckley. Filed October 5, 2007. Issued May 1, 2012. **Patent No. US8171431.**
- [P.3] Hover Widgets: Using the Tracking State to Extend the Capabilities of Pen-Operated Devices. **Tovi Grossman**, Ken Hinckley, Patrick Baudisch and Maneesh Agrawala. Filed October 6th, 2005. (Pending).
- [P.2] Displaying Animation as a Static Image on a Graphical User Interface. Patrick Baudisch, Desney Tan, Dan Robbins, Ken Hinckley, Maneesh Agrawala, **Tovi Grossman**, Steve Drucker and George Robertson. Filed December 2005. Issued Jul 16, 2013. **Patent No. US 8487937.**
- [P.1] Extended Capabilities of Pen-Operated Devices. **Tovi Grossman**, Ken Hinckley, Patrick Baudisch and Maneesh Agrawala. Filed June 2005 (Provisional).

INVITED TALKS

Instrumented and Connected: Designing Next-Generation Learning Experiences

[p.20] Carnegie Mellon University. August 2016.

Leveraging Wearables and the Internet of Things for Learning and Task Performance

[p.19] Dartmouth College. February 2016.

Overview of HCI Research at Autodesk Research

[p.18] KAIST. April 2015.

Input, Interaction, and Learning at Autodesk Research

[p.17] University of Waterloo. November 2013.

Understanding and Improving the Learnability of Software Applications

[p.16] Stanford University. June 2012.

[p.15] Massachusetts Institute of Technology. March 2012.

[p.14] University of Waterloo. July 2010.

Interaction design based on human capabilities for contemporary and emerging technologies

- [p.13] Microsoft Research, Redmond. April 2008.
- [p.12] Brown University. March 2008.
- [p.11] Queen's University. March 2008.
- [p.10] University of Ontario Institute of Technology. March 2008.
- [p.9] Georgia Institute of Technology. March 2008.
- [p.8] Florida International University. February 2008.
- [p.7] University of Minnesota. February 2008.
- [p.6] Cornell University. February 2008.
- [p.5] Harvard University. February 2008.
- [p.4] University of Washington. February 2008.
- [p.3] Adobe Systems Inc., San Jose. January 2008.

Designing and encouraging usage of interaction accelerators

- [p.2] University of Washington. January 2008.

Interaction with volumetric displays

- [p.1] University of California, Berkeley. February 2007.

SERVICE

Conference Chairing and Management

- ACM ISS International Conference on Interactive Surfaces and Spaces, Program Chair (2017)*
- ACM CHI Conference on Human Factors in Computing Systems, Steering Committee (2016-2019)*
- ACM CHI Conference on Human Factors in Computing Systems, Subcommittee Chair (2017)*
- ACM UIST Symposium on User Interface Software and Technology, Program Chair (2015)*
- ACM CHI Conference on Human Factors in Computing Systems, Technical Program Chair (2014)*
- ACM CHI Conference on Human Factors in Computing Systems, Subcommittee Chair (2013)*
- ACM CHI Conference on Human Factors in Computing Systems, alt.chi Chair (2010)*
- ACM CHI Conference on Human Factors in Computing Systems, alt.chi Chair (2009)*

Conference Program Committees

- ACM CHI Conference on Human Factors in Computing Systems (2016)*
- ACM UIST Symposium on User Interface Software and Technology (2014)*
- ACM CHI Conference on Human Factors in Computing Systems (2012)*
- ACM UIST Symposium on User Interface Software and Technology (2011)*
- ACM CHI Conference on Human Factors in Computing Systems (2011)*
- IEEE 3DUI Symposium on 3D User Interfaces (2011)*
- ACM UIST Symposium on User Interface Software and Technology (2010)*
- ACM International Conference on Interactive Tabletops and Surfaces (2010)*
- ACM CHI Conference on Human Factors in Computing Systems (2010)*
- IEEE 3DUI Symposium on 3D User Interfaces (2010)*
- ACM UIST Symposium on User Interface Software and Technology (2009)*
- ACM International Conference on Interactive Tabletops and Surfaces (2009)*
- IEEE 3DUI Symposium on 3D User Interfaces (2009)*
- ACM UIST Symposium on User Interface Software and Technology (2008)*
- IEEE International Workshop on Tabletops and Interactive Surfaces (2008)*

Conference Paper Reviewing

- ACM CHI Conference on Human Factors in Computing Systems*
- ACM Graphics Interface Conference*

ACM ITS Conference on Interactive Tabletops and Surfaces
ACM SIGGRAPH Conference on Computer Graphics and Interactive Techniques
ACM SIGGRAPH ASIA Conference on Computer Graphics and Interactive Techniques in Asia
ACM UIST Symposium on User Interface Software and Technology
Eurographics Annual Conference of the European Association for Computer Graphics
Eurographics Joint Virtual Reality Conference
IEEE Symposium on 3D User Interfaces
IEEE Information Visualization Conference
IEEE International Workshop on Tabletops and Interactive Surfaces

Journal Paper Reviewing

ACM Transactions on Computer-Human Interaction
Elsevier International Journal of Human-Computer Studies
IEEE Computer Graphics and Applications
IEEE Pervasive Computing
IEEE Transactions on Visualization and Computer Graphics
Taylor & Francis Human-Computer Interaction

INDUSTRY TECHNOLOGY TRANSFER

- 2016 *Autodesk Sketchbook Motion [C.61]*
Draco is a new system that allows users to add rich animation effects to illustrations, using a sketch-based interface. Originally published at ACM CHI 2014, a technology preview was subsequently demonstrated at the SIGGRAPH 2014 Studio. The system has now been released as a standalone product, branded as Autodesk Sketchbook Motion. The product has been downloaded over 200 000 times and was featured on the iTunes App Store. I served as the supervisor for the research project, and a design consultant for the productization effort.
- 2014 *Meshmixer Tubes [C.65]*
Our work published at ACM UIST 2014 explored the digital fabrication of interactive and electronic 3D models. We introduced a general technique for routing internal pipes through the interior of 3D models. Our path routing algorithm utilizes a physics-based simulation to minimize pipe bending energy, allowing easy insertion of media post-print. The work has now been released as an official feature of Autodesk Meshmixer 2.6. I served as the supervisor for the research project
- 2014 *Autodesk Screencast [C.27]*
My research on the Chronicle system, originally published at ACM UIST 2010, was developed and released by Autodesk Research as a technology preview called “Project Chronicle”. The project is a community driven learning system that allows users to capture video and workflow meta-data, and share the content on a web-based system. The web player receives an upload and automatically generates a video tutorial, with an interactive timeline marked up with all the commands, settings, and products which were used in the workflows. In 2014 the system was officially launched as a product, branded as Autodesk Screencast. The web system has received over 3 000 000 site visitors, and has generated over 100 000 tutorial videos generated by the user community. I was the lead researcher for the project, and the lead designer for the productization.
- 2010 *Autodesk ToolClip™ Videos [C.25]*
ToolClips are short videos embedded within software tooltips that provide real-time contextual assistance. My research, published at ACM CHI 2010, demonstrated that they offered significant advantages for the purpose of learning to use new software tools and functionality. Subsequent to publication, ToolClips were developed as a multi-product Autodesk component. ToolClip videos are now a registered trademark of Autodesk and can be found in all of Autodesk’s major software applications, including AutoCAD, Revit, 3DSMax, Inventor, and Maya. I was the lead researcher for the project, and the lead designer for the productization.

2010

CommunityCommands [J.3, C.22, C.56]

The CommunityCommands research project was originally published at the ACM UIST 2009 conference. This system applies recommender system technology to the domain of software learning. Collaborative filtering algorithms are used to suggest new commands for users to try, based on their personalized usage patterns. Subsequent to its publication, the system was developed into a fully-functional plug-in for Autodesk AutoCAD, and released as a technology preview to the public. A research paper describing the deployment received the AAAI 2014 Innovative Application Award for its use of artificial intelligence technology within a deployed system. I was a research collaborator for the research project, and a design consultant for its productization.

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