

TIFFANY TSENG, PhD

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EDUCATION

- 2016 **PhD in Media Arts and Sciences**
Massachusetts Institute of Technology
Lifelong Kindergarten Group, MIT Media Lab (Advisor: Mitchel Resnick)
Research interests: HCI, learning technologies, online communities
- 2011 **MS in Mechanical Engineering - Design Methodology**
Stanford University
Engineering Education Lab (Advisor: Sheri Sheppard)
- 2009 **BS in Mechanical Engineering**
Massachusetts Institute of Technology
Ideation Lab (Advisor: Maria Yang)

EMPLOYMENT

- Jan 2020 – Present **University of Tokyo** Tokyo, Japan
Project Assistant Professor & Visiting Researcher
HCI research on design tools for children and makers to explore machine learning and electronics in the Kawahara Lab, Department of Electrical Engineering and Information Sciences
- Aug 2018 – Dec 2019 **Glitch** New York, NY
Design Engineer
Led design for the Glitch Community, a platform for anyone to build and share apps on the web. Hybrid UX engineering role involved front-end engineering (React.js), UX/UI prototyping and wireframing, user research, and illustration. Executed end-to-end design from concept to production. Interviewed and helped hire 8 full-time software engineers and designers as startup doubled in size.
- Oct 2016 – Jun 2018 **Autodesk** San Francisco, CA
Lead UX Designer
Led user experience for electronic design features in Tinkercad and EAGLE. Designed and launched visual programming for Arduino and 3D electronic parts for over 10 million Tinkercad users. Led design efforts across multiple major EAGLE releases, focusing on features bridging mechanical and electrical design between EAGLE and Fusion 360.
- Summer 2016 **Harvard Library Innovation Lab** Cambridge, MA
Summer Fellow
Developing open tools for community building in library makerspaces.
- 2011 – 2016 **MIT Media Lab** Cambridge, MA
Research Assistant
Designed and built two online communities and open-hardware tools ([Spin](#) and [Build in Progress](#)) for supporting makers sharing interactive media of design projects online, collectively supporting 2,000+ users. Developed online communities using Ruby on Rails and built companion native iOS and Android apps. Collaborated with makerspaces in institutions like NYU, Tufts, the Exploratorium, and the Chicago Public Library and published research at leading HCI conferences including DIS, IDC, TEL, and CHI. Directly supervised and managed over 20 undergraduate and graduate research assistants.
- Apr - Aug 2011 **IDEO** Palo Alto, CA
Mechanical Engineering Intern
Created prototypes, test fixtures, engineering drawings, and concepts for several client-facing projects ranging from consumer electronics, food and beverage, and toys. Co-led design sprint with client.
- Summer 2010 **Luidia Inc.** San Carlos, CA
Engineering Intern
Rapid prototyped several new concepts for interactive whiteboard products.

- 2009 – **Stanford University** Palo Alto, CA
2011 **Research Assistant**
Developed *Mechanix*, an interactive game for children to construct physical chain reactions and learn from user-generated designs. Project awarded the Disney Research Learning Challenge Innovation award at SIGGRAPH. Published and presented research at TEI, IDC, and CHI. Wrote successful provisional patent on Transparent Magnetic Display for Image Tracking of Objects and ran successful Kickstarter campaign (146% funded at \$3600) featured on the Kickstarter homepage.
- Research assistant on Academic Pathways Study in the Engineering Education Lab, identifying factors contributing to the retention of undergraduate engineering students through survey and interview data. Published at ASEE.
- Summer **Fisher-Price** East Aurora, NY
2008 **Product Development Intern**
Created prototypes and addressed manufacturing modifications for existing and developing Baby Gear products. Developed mathematical and dynamic model of new swing concept in Pro/E.
- Jan **5 Wits Productions** Saugus, MA
2008 **Mechanical Engineering Extern**
Designed concepts and prototypes for interactive spy-themed room escape.
- Summer **Insight Product Development** Maynard, MA
2007 **Engineering Intern**
Generated 3D models and assemblies, conducted flow rate experiments, and documented medical device testing.

AWARDS AND DISTINCTIONS

- 2011 – 2016 NSF Graduate Research Fellowship (\$138,000)
2015 Maker Faire Bay Area Editor's Choice Award for Spin
2011 Maker Faire Bay Area Education Award for Mechanix
2010 Disney Research Learning Challenge Innovation Award for Mechanix
2009 – 2011 Stanford Graduate Engineering Fellowship
2008 Pi Tau Sigma Mechanical Engineering Honor Society

ADDITIONAL

- 2018 Recurse Center Alum | Created SVG apps during 6-week self-directed programmer's retreat
2017 IPC-Certified Interconnect Designer
2014 Maker Education Open Portfolio Project | National working group member
2011 Mechanix Kickstarter project 146% funded (\$3,600) | Featured on Kickstarter homepage

PUBLICATIONS

Book chapters

- 2016 **Tseng, T.** (2016). Build in Progress: Building process-oriented documentation. In K. Peppler, E. Halverson, & Y. Kafai (Eds.), *Makeology: The maker movement and the future of learning (Volume 2)*. New York, NY: Routledge.
- 2014 **Tseng, T.** (2014). Modifying the Shape of an Arduino. In A. Gibb (Ed.) *Building open source hardware: DIY manufacturing for hackers and makers* (pp. 83-94). Upper Saddle River, NJ: Addison-Wesley.

Conference papers

- 2016 **Tseng, T.** and Resnick, M. (2016). Spin: Examining the Role of Engagement, Integration, and Modularity in Supporting Youth Creating Documentation. *In Proceedings of DIS, Brisbane, Australia.*
- 2015 **Tseng, T.** (2015). Making Make-throughs: Supporting young makers sharing design process. *In Proceedings of Fablearn.* Stanford, CA.
- Tseng, T.** (2015). Spin: A photography turntable system for creating animated documentation. *In Proceedings of IDC* (pp. 422-425). Medford, MA.
- Tseng, T.** and Tsai, G. (2015). Process products: Capturing design iteration with digital fabrication. *In Proceedings of TEI* (pp. 631-636). Stanford, CA.
- 2014 **Tseng, T.** and Resnick, M. (2014). Product versus process: Representing and appropriating DIY projects online. *In Proceedings of DIS* (pp. 425-428). Vancouver, Canada
- Tseng, T.**, Yang, M., and Ruthmann, A. (2014). Documentation in progress: Challenges with representing design process online. *In Proceedings of IDETC.* Buffalo, NY.

- 2013 **Tseng, T.** and Bryant, C. (2013). Design, reflect, explore: Encouraging children's reflections with Mechanix. *In Proceedings of CHI Extended Abstracts* (pp. 619-624). Paris, France.
- 2012 **Tseng, T.** and Resnick, M. (2012). Building examples: Media and learning affordances. *In Proceedings of IDC* (pp. 176-179). Bremen, Germany.
Tseng, T., Hemsley, R., and Resnick, M. (2012). Replay: A self-documenting construction kit. *In Proceedings of IDC* (pp. 320-322). Bremen, Germany.
 Ducao, A., **Tseng, T.**, and von Kapri, A. (2012). Transparent: Brain computer interface and social architecture. *SIGGRAPH Posters* (p. 26). Los Angeles, CA.
- 2011 **Tseng, T.**, Bryant, C., and Blikstein, P. (2011). Collaboration through documentation: Automated capturing of tangible constructions to support engineering design. *In Proceedings of IDC* (pp. 118-126). Ann Arbor, Michigan.
Tseng, T., Chen, H.L., and Sheppard, S. (2011). Early academic experiences of non-persisting engineering undergraduates. *In Proceedings of ASEE*. Vancouver, Canada.
Tseng, T. and Yang, M.C. (2011). The role of spatial-visual skills in a project-based engineering design course. *In Proceedings of ASEE*. Vancouver, Canada.
Tseng, T., Bryant, C., and Blikstein, P. (2011). Mechanix: A tangible interactive wall for exploring engineering design. *In Proceedings of TEI* (pp. 265-266). Funchal, Portugal.

INVITED TALKS, PANELS, AND DEMOS

- 2021 **Computer Science Teachers Association Future of CS Summit** Music, Spying, and Love: New ideas for your CS classroom with the micro:bit sensors (with Katie Henry of micro:bit Foundation and John Maloney of MicroBlocks)
micro:bit LIVE Interactive Pets with the micro:bit and Machine Learning
<https://youtu.be/s0pl6j9EozE>
- 2020 **University of Applied Sciences Northwestern Switzerland (FHNW)** Making Make-Throughths
University of Waterloo Stratford School of Business Hybrid Creators and the Future of Design
!!Con West Packages, but in 3D! Interpreting Packaging Diagrams as SVG
https://youtu.be/KMr6_PURpqc?t=15994
Concordia University Hybrid Creators and the Future of Design Education
- 2018 **Recurse Center Localhost Talk Series** Stencilfy (Invited talk on designing a SVG font app)
University of Toronto Storyboarding and Design Heuristics (Invited lectures)
University of California Berkeley Design Generalist "In the Wild" (Invited talk for Design Field Notes lecture series)
SupplyFrame's Hardware Developers Didactic Galactic EAGLE UX from Component to Design
<https://youtu.be/T51LW5OgSME>
- 2017 **Sketching in Hardware** Circuit Assemblies: Building Interactive 3D-Printed Things with Tinkercad
Santa Clara County Office of Education Tinkercad Circuit Assemblies
University of Washington Makerspaces: Combining Interests, Community, and Tools for Empowerment
- 2016 **University of California Berkeley** Designing for Design Process (Guest lecture for CS160, UI Design)
Concord Consortium Documentation as Stories of Design Process
littleBits Making Make-throughths
University of Colorado Boulder Transparent Making
University of Minnesota Transparent Making
- 2015 **Sketching in Hardware** Make-throughths
NYU ITP Creating Useful Documentation
MAKE Maker Faire Bay Area Spin and Build in Progress (Demo awarded Maker Faire Editor's Choice Award)
- 2014 **Design Exchange Boston Conference** Thinking Like a Kid panelist
- 2013 **MIT Mechanical Engineering** Building a Portfolio (Guest lecture)
Sketching in Hardware Stories and Recipes: Sharing Design Process
MAKE Maker Camp Fun With LEGO
<https://youtu.be/wq57RbjpVfw?t=1519>
- 2012 **MAKE Maker Faire Bay Area** Mechanix (Demo awarded Maker Faire Educator's Award)
- 2010 **SIGGRAPH Disney Research Learning Challenge** Mechanix (Demo awarded Innovation Award in international competition for "demonstrating a fundamental change to the way learning is enabled through transformative uses of digital media and interactivity")

SERVICE

Conference reviewer

ACM Conference on Human Factors in Computing Systems (2021, 2018, 2016, 2015)
ACM Interaction Design and Children (2017, 2016)
ACM Designing Interactive Systems (2017)
ACM Creativity & Cognition (2021)
ACM User Interface Software and Technology (2017)
ASME International Design Engineering Technical Conference (2014)
Fablearn (2016, 2015)
Open Hardware Summit (2012)

Journal reviewer

Journal of Engineering Education (2015, 2011, 2010)

SELECTED PRESS

- 2019 **Maker Update: Framed** Featuring Makecode Pixelart Maker App
<https://www.digikey.com/en/maker/videos/maker-update/donald-bell-maker-update-framed>
- 2018 **Bantam Tools The Edge Podcast** Designing Tools & Interfaces For Making (Interview about UX for EAGLE, prototyping with SVGs)
<https://www.bantamtools.com/blogs/theedge/tiffany-tseng-designing-tools-interfaces-for-making>
- 2017 **Makezine** Tinkercad Adds Embedded Circuits, Lego Exports, and More
<https://makezine.com/2017/05/20/tinkercad-adds-embedded-circuits-lego-exports/>
Hackaday Tinkercad Does Arduino
<https://hackaday.com/2017/07/11/tinkercad-does-arduino/>
- 2016 **PSFK** Putting a New Spin On Product Photography <http://www.psfk.com/2016/02/putting-a-new-spin-on-photography.html>
- 2015 **Exploratorium Tinkering Studio** Spin Turntable Prototyping <http://tinkering.exploratorium.edu/2015/10/02/spin-bot-prototyping>
Hackaday Spin DIY Photography Turntable System <http://hackaday.com/2015/05/24/spin-diy-photography-turntable-system>
Atmel Bits & Pieces This Turntable Lets You Create Animated GIFs of Your DIY Projects
<https://atmelcorporation.wordpress.com/2015/05/26/this-turntable-lets-you-create-animated-gifs-of-your-diy-projects/>
Agency by Design Reconsidering Failure in Maker-Centered Learning
<http://www.agencybydesign.org/reconsidering-failure-in-maker-centered-learning>
- 2014 **Lifehacker** Build in Progress Shares DIY Projects Before They're Finished
<http://lifehacker.com/build-in-progress-shares-diy-projects-before-theyre-fin-1623380893>
Popular Technology Invention Help (featuring Build in Progress)
<http://www.ernlive.com/show/poptech-radio/59/episodes/invention-help-segment-6-56>
- 2010 **Stanford School of Education** Hooking Children on Engineering
<https://ed.stanford.edu/news/hooking-children-engineering>

TEACHING

12 semesters of teaching and mentoring grad and undergrad students at MIT and Stanford in product design courses.

- March 2017 **Designing and Fabricating Printed Circuit Boards (Instructor)** Autodesk
Two-day class for Artists in Residence program at Autodesk, covering circuit board design in EAGLE, fabrication with OtherMachine desktop mill, and assembly processes (hand soldering + reflow oven)
- 2016, 2013, 2012, 2009 **Toy Product Design 2.00B (Lab Supervisor / Team Mentor)** MIT Mechanical Engineering
Mentored undergraduate students prototyping interactive toys
- January 2015 **Iterative Interaction Design 2.S97 (Instructor)** MIT Mechanical Engineering
Designed and taught month-long interaction design course for MIT undergraduates covering digital fabrication, Arduino prototyping, and design iteration. Led team of five undergraduate mentors and teaching assistants. 3.9/4.0 instructor rating.
- January 2014 **Human + Computer (Co-Instructor)** MIT, RISD, Brown
Taught and advised undergraduate and graduate students from MIT, RISD, and Brown on interaction design projects inspired by transhumanism. Culminated in gallery show at RISD's student art gallery.

- 2013, 2012 **Introduction to Design 2.00 (Lab Instructor)** MIT Mechanical Engineering
Mentored undergraduate mechanical engineering majors in human-centered design course.
- Fall 2012 **How to Make Almost Anything (Teaching Assistant)** MIT Media Lab
Lab assistant for graduate digital fabrication course. Taught vinyl cutting circuit design.
- Aug 2012 **Lab Technician** Haystack Mountain School of Craft
Assisted with managing Fab Lab and helping practicing artists and designers creating projects in the shop.
- Fall 2011 **Product Engineering Processes 2.009 (Team Mentor)** MIT Mechanical Engineering
Mentored team of 18 senior mechanical engineering students in capstone course.
- Winter 2011 **Beyond Bits and Atoms (Lab Teaching Assistant)** Stanford
Teaching assistant for graduate course on developing educational technologies.
- Summer 2009 **Women's Technology Program (Residential Tutor)** MIT
Taught circuit design and mentored high school senior girls over the course of two months as part of summer engineering enrichment program.

MENTORSHIP

As a graduate student at the MIT Media Lab, I directly supervised **21 undergraduate and graduate research assistants** from MIT, Harvard, Wellesley, and RISD across departments such as Mechanical Engineering, Computer Science and Electrical Engineering, Education, and Industrial Design, including the following:

Peter Godart, MIT 2015 (now PhD student at MIT, formerly NASA Jet Propulsion Lab)
 Ishwarya Ananthabhotla, MIT 2015 (now PhD student at MIT Media Lab)
 Ryan Mather, RISD 2015 (now Google ATAP, formerly LittleBits)
 Rahul Singh, Harvard 2015 (now MIT Teaching and Learning Lab)
 Stephanie Su, MIT 2013 (now Google)
 Stephen Rodan, MIT 2016 (now NASA Jet Propulsion Lab)
 Alyssa Waln, MIT 2016 (now Google)
 Teresa Tai, Wellesley 2016 (now Google)
 Amber Meighan, MIT 2017 (now Facebook)

In the fall and winter of 2019, I was also a weekly volunteer at the **Brooklyn Public Library Teen Tech Center**, where I mentored teens on web programming, LEGO robotics, and digital design.

SKILLS

Research Methods	Interviews, ethnography, surveys, content analysis, diary studies, usability testing, data analytics, ANOVA
Programming	Javascript, Node, React, HTML, CSS, SASS, Processing, Ruby on Rails, Objective-C, Java, Stata
Design Software	Visual Design: Sketch, Figma, Framer, Adobe Creative Suite (Illustrator, InDesign, Photoshop, Premier) Mechanical CAD: SolidWorks, Fusion 360 Electrical CAD: EAGLE
Fabrication	Laser cutting, 3D printing, CNC routing, vinyl cutting, waterjet, milling, lathing, injection molding, vacuum forming, metalworking, and woodworking
Other Technologies	Mobile development (iOS & Android), PostgreSQL, Heroku, Git, Arduino, Raspberry Pi, LaTeX, MATLAB

PERSONAL

Reviewer of 2000+ snacks via [Tasty Snacking](#) (2013–Present)
 WMBR DJ for [Eater's Digest radio show](#) (2011–2016)
 Design Editor for 400-page MIT Technique Yearbook (2009)