KATHERINE W. SONG

https://kwsong.github.io
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EDUCATION

Ph.D. candidate, University of California - Berkeley, Berkeley, CA — 2019-2024 (expected)
Department of Electrical Engineering and Computer Sciences
Major area: human-computer interaction; Minors: graphics & computer vision, new media

S.M., Massachusetts Institute of Technology, Cambridge, MA — 2011-2013
Department of Electrical Engineering and Computer Science (EECS)
Major: electronic materials & devices; Minor: biological & health sciences
Completed Ph.D. qualifying exams, coursework, & teaching requirements (2011-2014)

B.S.E. with Highest Honors, **Princeton University,** Princeton, NJ — 2007-2011
Major: electrical engineering; Minors: materials science, applications in computing

ACADEMIC RESEARCH EXPERIENCE

Graduate Researcher, Hybrid Ecologies Lab, UC Berkeley — Aug 2019-present
Advisor: Professor Eric Paulos
Area of research: Decomposable interactive systems

Graduate Research Fellow, MIT Media Lab & Charles Stark Draper Laboratory — May 2013-Dec 2014
Advisors: Professor Hugh Herr (MIT Media Lab), Dr. Bryan L. McLaughlin (Draper)
Designed & fabricated a peripheral nerve interface for bi-directional prosthesis control

Graduate Research Fellow (Master's research), Massachusetts Institute of Technology — Aug 2011-May 2013
Advisor: Professor Vladimir Bulovic
Invented an electrophoretic deposition technique to form quantum dot (QD) films for light emitting devices
Fabricated & characterized record-efficiency near-infrared QD-LEDs using core-shell PbS-CdS quantum dots

Undergraduate Researcher, Princeton University — Jan 2009-May 2011
Advisers: Professors Sigurd Wagner & Naveen Verma
Fabricated thin-film transistors (TFT) using a new hybrid material as a gate dielectric
Characterized the flexibility of TFTs made with the new gate dielectric on plastic
Designed & fabricated a TFT circuit to interface between large-area sensing sheets & nanoscale integrated circuit chips for structural health monitoring

Research Experience for Undergraduates Student, Carnegie Mellon University — Summer 2008
Advisor: Professor James W. Schneider
Used DNA-surfactant tagging to sort conducting/semiconducting carbon nanotubes via capillary electrophoresis

INDUSTRY EXPERIENCE

Technology Innovation Research Associate, Accenture Labs Future Technologies — Summer 2022
Manager: Dr. Andreea Danielescu
Designed a 100% backyard-degradable packaging system that wirelessly heats its contents

Display Electrical Engineer (full-time), Apple Inc. — Feb 2015-Oct 2017
Manager: Dr. Marc DeVincentis
Direct Responsible Individual (DRI) for iPhone X display rigid flex PCB, from conception to mass production
DRI for iPhone X/Watch 2 failure analysis during SW bring-up & assembly at factory sites
Collaborated with vendors to develop new display & module packaging technologies

Visiting Researcher*,* Palo Alto Research Center, Palo Alto, CA — Summer 2010
Host: Dr. Robert A. Street, Senior Research Fellow
Characterized & modeled organic bulk heterojunction & silicon nanowire solar cells

TEACHING EXPERIENCE

Instructor, CS160: User Interface Design and Development, UC Berkeley — Summer 2023
Head instructor for upper-division CS class comprising 60 students & a course staff of 7

Instructor, Maker Launchpad Summer Program, UC Berkeley — Summer 2022
Developed & taught virtual reality workshop with Unity & Oculus Quest headsets

Graduate Student Instructor, DES INV 211: Designing Emerging Tech, UC Berkeley — Fall 2021
Sole GSI for Masters of Design course comprising 4 projects that use emerging technologies
Developed teaching material for new augmented reality module

Instructor, Online SAT Essay Course — Fall 2018
Taught a 30-student class in Singapore how to write the SAT Essay & read/write argument

Teaching Assistant, MAS.600: Human 2.0, MIT Media Lab — Spring 2014
1 of 2 TAs for graduate-level project-based course on technologies for human augmentation

Lab Assistant, ELE208: Fundamentals of Semiconductor Devices, Princeton University — Spring 2011
Assisted with lab experimental setup & measurements for student with disabilities

Teaching Assistant, ELE302: Systems Design and Analysis, Princeton University — Spring 2011
Assisted students with EE capstone project – a mini autonomous car capable of lane following & obstacle avoidance

Writing Center Fellow, Princeton University Writing Program — Fall 2008-Spring 2011
1 of ~50 selected undergraduate & graduate student fellows
Held 1:1 conferences to help students from all disciplines with writing & presentations

Peer Tutor, Princeton University Office of the Dean of College — Fall 2009-Spring 2011
Offered tutoring for 9 technical classes in engineering, math, physics, & computer science

FELLOWSHIPS & AWARDS

Jacobs Institute Innovation Catalysts Grants Sp 2020, Fa 2020,
$3500 to cover research costs for proposed projects Sp 2021, Sp 2022

Berkeley Graduate Division William S. Floyd, Jr. Fellowship BEARGradS Award Sep 2019
Awarded to 1 new admit in the EECS department every year. 1 year stipend, tuition, & fees

Berkeley Graduate Division Berkeley Fellowship for Graduate Study Sep 2019
Up to 2 years of stipend, tuition, & fees

National Defense Science and Engineering Graduate Fellowship 2019-2022
3 years of stipend, tuition, fees, & travel

National Science Foundation Graduate Research Fellowship 2011-2014
3 years of stipend, tuition, fees, & travel

Massachusetts Institute of Technology Henry Ford II Fellowship 2011-2012
1 year of stipend, tuition, & fees

Hertz Foundation Fellowship Finalist (1 of 50) Jan 2011

Princeton EE Department Charles Ira Young Tablet and Medal May 2011
"A memorial tablet to Charles Ira Young, class of 1883, has been placed in the Engineering Building by friends of Mr. Young. The medal will be awarded each year to the student who excels in research in Electrical Engineering."

Princeton EE Department Peter Mark Prize May 2011
"Awarded annually to a senior in Electrical Engineering, having an outstanding record in the area of electronic materials and devices."

Princeton Materials Science & Engineering Outstanding Materials Student Award May 2011
"PRISM's highest undergraduate honor, the 'Outstanding Materials Student Award' recognizes the combined excellence in academics, research, & dedication to materials science."

Princeton School of Engineering & Applied Sciences Tau Beta Pi Prize May 2011
"This award is given to a senior class member, or members, who have significantly contributed a major part of his or her time in service to the SEAS."

Barry M. Goldwater Scholarship Apr 2010

Princeton University Shapiro Prize for Academic Excellence Sep 2008

Princeton Physics Department Manfred Pyka Memorial Physics Prize Jun 2008

SERVICE (ACADEMIC)

Guest Associate Editor, Transactions on Computer-Human Interaction (TOCHI) 2023-present
Special issue on "Unmaking and HCI:Techniques, Technologies, Materials, and Philosophies Beyond Making"

Reviewer: ISCW19, CHI21, DIS21, CHI22***, CSCW22*, CHI23**, DIS23, UIST23, ISWC23, TEI24, CHI24, TOCHI (* denotes "outstanding review")

Student Reviewer for PhD Admissions, UC Berkeley EECS Department Fall 2022

HCI Area Coordinator for PhD Admit Visit Days, UC Berkeley 2020 & 2021

Organizer, Berkeley HCI Undergraduate Reading Group 2020-2022
Led weekly meetings for Berkeley undergraduates interested in HCI

Chair, MIT Microsystems Technology Laboratories Annual Research Conference (MARC) Jan 2013
Led the planning & execution of a ~300-attendee, student-run annual conference
Introduced new types of technical presentations & interactive opportunities

SERVICE (COMMUNITY)

Volunteer, Berkeley Humane Society, Berkeley, CA Nov 2019-Mar 2020
Supported shelter operations through facility upkeep & animal caretaking

Technical Mentor, FIRST Robotics Competition Team #7419, Dublin, CA 2018-2019
Guided robot design & program management for Quarry Lane HS's 1st FRC team

Volunteer, Nepal Volunteers Council Nov 2016
Set up a computer lab for a school in Kathmandu by repairing donations & salvaging parts

REFEREED PUBLICATIONS & CONFERENCE PROCEEDINGS

1. **Katherine W. Song** and Eric Paulos, "Vim: Customizable, Decomposable Electrical Energy Storage," *Proceedings of the 2023 CHI Conference on Human Factors in Computing Systems (CHI '23)*. 28.4% acceptance rate.
2. **Katherine W. Song***, Christine Dierk*, Szu Ting Tung, and Eric Paulos, "Lotio: Lotion-Mediated Interaction with an Electronic Skin-Worn Display," *Proceedings of the 2023 CHI Conference on Human Factors in Computing Systems (CHI '23)*. 28.4% acceptance rate.
3. **Katherine W. Song,** Aditi Maheshwari, Eric M. Gallo, Andreea Danielescu, and Eric Paulos, "Towards Decomposable Interactive Systems: Design of a Backyard-Degradable Wireless Heating Interface," *Proceedings of the 2022 CHI Conference on Human Factors in Computing Systems (CHI '22)*. 12.5% first-round acceptance rate. **Best Paper Honorable Mention** (top 5% of papers)
4. **Katherine W. Song** and Eric Paulos, "Unmaking: Enabling and Celebrating the Creative Material of Failure, Destruction, Decay, and Deformation," *Proceedings of the 2021 CHI Conference on Human Factors in Computing Systems (CHI '21)*. 26.3% acceptance rate.
5. Benjamin Maimon, Anthony N. Zorzos, **Katherine Song**, Rhyse Bendell, Ron Riso, and Hugh Herr, "Assessment of nerve regeneration through a novel microchannel array," *International Journal of Physical Medicine*

& Rehabilitation, 4(2) (2016). 2.9 impact factor.

6. Geoffrey J. Supran, **Katherine W. Song**, Gyuweon Hwang, Raoul Correa, Jennifer Scherer, Yasuhiro Shirasaki, Moungi Bawendi, and Vladimir Bulovic, "High-performance shortwave-infrared light-emitting devices using core-shell (PbS-CdS) colloidal quantum dots," *Advanced Materials* 27(8) 2015. 32.1 impact factor.
7. Geoffrey J. Supran, Yasuhiro Shirasaki, **Katherine W. Song**, Jean-Michel Caruge, Peter T. Kazlas, Seth Coe-Sullivan, Trisha L. Andrew, Moungi G. Bawendi, and Vladimir Bulović, "QLEDs for displays and solid-state lighting," *MRS Bulletin* 38(9) 2013. 4.9 impact factor.
8. **Katherine W. Song**, Ronny Costi, and Vladimir Bulović, "Electrophoretic deposition of CdSe/ZnS quantum dots for light emitting devices," *Advanced Materials* 25(10) 2013. 32.1 impact factor.
9. Yingzhe Hu, Warren Rieutort-Louis, Josh Sanz-Robinson, **Katherine Song**, James Sturm, Sigurd Wagner, and Naveen Verma, "High-resolution sensing sheet for structural-health monitoring via scalable interfacing of flexible electronics with high-performance ICs," *2012 Symposium on VLSI Circuits*. 2.1 impact factor.
10. Yin Liang, **Katherine Song**, Leo Shaw, Michael Zhu, Alex Tait, Nicole Businelli, Jane Yang, Ryan Soussan, Haonan Zhou, and Thomas Mbise, "The homemaker's hydrogen generator: A report for IAHE student hydrogen design competition 2010," *International Journal of Hydrogen Energy* 36(13880) 2011. 7.1 impact factor.
11. Robert A. Street, **Katherine W. Song**, John Northrup, and Sarah Cowan, "Photoconductivity measurements of the electronic structure of organic solar cells,"*Physical Review B* 83(165207) 2011. 3.7 impact factor.
12. Robert A. Street, **Katherine W. Song**, and Sarah Cowan,"Influence of diode series resistance on the photocurrent analysis of organic semiconductors," *Organic Electronics* 12(244) 2011. 3.9 impact factor.
13. Lin Han, **Katherine Song**, Prashant Mandlik, and Sigurd Wagner, "Ultra-high flexibility of amorphous silicon transistors made with a resilient insulator," *Applied Physics Letters* 96(042111) 2010. 4.0 impact factor.

JURIED CONFERENCE PAPERS AND ABSTRACTS (lightly reviewed)

1. **Katherine W. Song**, "Decomposable Interactive Systems," *Adjunct Proceedings of the 36th Annual ACM Symposium on User Interface Software and Technology* (*UIST '23*). 1 of 8 doctoral symposium papers.
2. **Katherine W. Song***, Janaki Vivrekar*, Lynn Yeom*, Eric Paulos, and Niloufar Salehi, "Crank That Feed: A Physical Intervention for Active Twitter Users," *2021 CHI Conference on Human Factors in Computing Systems Extended Abstracts (CHI '21 EA)*. ~40% acceptance rate.
3. **Katherine W. Song**, Ronald R. Riso, and Hugh M. Herr, "Microfabricated, regeneration-based peripheral nerve interface for recording and stimulation," *Neural Interfaces Conference*, Dallas TX. 23 June 2014.
4. **Katherine W. Song**, Ronny Costi, and Vladimir Bulović, "Electrophoretic deposition of CdSe/ZnS quantum dots for light emitting devices," *MRS Fall Meeting*, Boston MA. 28 Nov 2012.
5. Robert Street, **Katherine Song**, and Alexa Krakaris, "Localized state spectroscopy in organic solar cells," *MRS Fall Meeting*, Boston MA. 28 Nov 2011.
6. Sourobh Raychaudhuri, Rene A. Lujan, **Katherine W. Song**, Chris Paulson, and Robert A. Street, "Large area a-Si/Si nanowire hybrid solar cells," *Nanotech Conference and Expo*, Boston MA. 13-16 June 2011.
7. **Katherine W. Song**, Lin Han, Prashant Mandlik, and Sigurd Wagner, "Top-gate thin-film transistors with a new gate dielectric," *Symposium A, MRS Spring Meeting*, San Francisco CA. 29 April 2011.
8. Sigurd Wagner, Lin Han, **Katherine W. Song**, Bhadri Visweswaran, Prashant Mandlik, Yifei Huang, Bahman Hekmatshoar, and James C. Sturm, "Geometries of amorphous silicon thin-film transistors with a hybrid gate dielectric," *Symposium A, MRS Spring Meeting*, San Francisco CA. 29 April 2011.
9. Robert Street, **Katherine Song**, and John Northrup, "Density of electronic states model for organic solar cells," *Symposium B, MRS Spring Meeting*, San Francisco CA. 28 April 2011.

10. Sourobh Raychaudhuri, Rene Lujan, **Katherine Song**, Chris Paulson, and Robert A. Street, "Disordered nanowire based photovoltaics," *Symposium B, MRS Spring Meeting*, San Francisco CA. 26 April 2011.
11. Lin Han, **Katherine Song**, Sigurd Wagner, and Prashant Mandlik, "New insulator for thin-film transistor backplanes and for flexible passivation layers," *Electrochemical Society Transactions* "Thin Film Transistors 10 (TFT 10)," 33(125) 2010.
12. Sigurd Wagner, Lin Han, Bahman Hekmatshoar, **Katherine Song**, Prashant Mandlik, Kunigunde H. Cherenack, and James C. Sturm, "Amorphous silicon TFT technology for rollable OLED displays," *Society for Information Display Digest* 10(917) 2010.
13. Lin Han, **Katherine Song**, Prashant Mandlik, and Sigurd Wagner, "a-Si:H TFTs with a new hybrid dielectric highly stable under mechanical and electrical stress," *Society for Information Display Digest* 10(238) (2010).
14. **Katherine W. Song**, Lin Han, and Sigurd Wagner, "Performance of amorphous silicon thin-film transistors under very high tensile strain," *Symposium A, MRS Spring Meeting*, San Francisco CA. 07 April 2010.
15. Lin Han, **Katherine Song**, and Sigurd Wagner, "A novel hybrid material for flexible OLED displays." *9th Annual Flexible Electronics and Displays Conference*, Phoenix AZ, Feb 2010.
16. Lin Han, **Katherine Song**, Sigurd Wagner, "A new material for the encapsulation of plastic foil substrates," *Symposium C, MRS Fall Meeting*, Boston MA, 30 Nov 2009.
17. **Katherine W. Song**, Lin Han, Sigurd Wagner, and Prashant Mandlik, "Effects of mechanical strain on the electrical performance of amorphous silicon thin-film transistors with a new gate dielectric," *Proceedings of the Materials Research Society Volume 1196*, C02-02, 2010.
18. **Katherine W. Song**, Lin Han, Sigurd Wagner, "Effects of mechanical strain on the electrical performance of amorphous silicon thin-film transistors with a new gate dielectric," *Symposium C, MRS Fall Meeting*, Boston MA, 30 Nov 2009.

CONFERENCE WORKSHOPS ORGANIZED

1. **Katherine W. Song***,* Fiona Bell, Himani Deshpande, Ilan Mandel, Tiffany Wun, Mirela Alistar, Leah Buechley, Wendy Ju, Jeeeun Kim, Eric Paulos, Ron Wakkary, "Sustainable Unmaking: Designing for Biodegradation, Decay, and Disassembly," Submitted to *CHI'24*.
2. Samar Sabie, **Katherine W. Song**, Tapan Parikh, Steven J. Jackson, Eric Paulos, Kristina Lindström, Åsa Ståhl, Dina Sabie, Kristina Andersen, and Ron Wakkary, "Unmaking@CHI: Concretizing the Material and Epistemological Practices of Unmaking in HCI," *CHI '22*.

INVITED LECTURES, TALKS, & WORKSHOPS

1. "Sustainable Unmaking" (guest lecture), Carnegie Mellon University STUDIO for Creative Inquiry, Nov 2023.
2. "Decomposable Interactive Systems" (guest lecture), UC Berkeley INFO C262: Theory and Practice of Tangible User Interfaces, Nov 2023.
3. Functional sustainable systems workshop, UC Santa Cruz ART 189: Special Topics in Sculpture – Bio Art & Design, Aug 2023.
4. "Towards Decomposable Interactive Systems," Berkeley Institute of Design Seminar, Jul 2023.
5. "Decomposable Interactive Systems: Sustainable Making and Unmaking for the Everyday Designer," UC San Diego Interactive Computing Seminar, Feb 2023.

PATENTS

1. Aditi Maheshwari, **Katherine W. Song**, and Eric M. Gallo, "Biodegradable packaging with integrated heating system," US Patent App 17/505,705 (2023).
2. Shengkui Gao, Hung Sheng Lin, Hyunsoo Kim, Hyunwoo Nho, **Katherine W. Song**, Mohammad Hajirostam, Myung-je Cho, Rui Zhang, Sang Y. Youn, Wei H. Yao, and Yafei Bi, "Adaptive pixel uniformity compensation for display panels," US Patent 10,529,053 B2 (2020).
3. Geoffrey J.S. Supran, **Katherine W. Song**, Gyuweon Hwang, Raoul Emile Correa, Yasuhiro Shirasaki, Moungi G Bawendi, and Vladimir Bulović, "Near-infrared light emitting device using semiconductor nanocrystals," US Patent 9,935,240 (2018).
4. Hugh M. Herr, Ronald R. Riso, **Katherine W. Song**, Richard J. Casler Jr., and Matthew J. Carty, "Peripheral neural interface via nerve regeneration to distal tissues," US Patent 9,474,634 B2 (2016).
5. Vladimir Bulović, **Katherine W. Song**, and Ronny Costi, "Deposition of semiconductor nanocrystals for light emitting devices," US Patent 9,472,723 (2016).

UNDERGRADUATES MENTORED

Christopher Bannon, fall 2023-present
Charming Zhang, fall 2023-present
Raphael David Condor, summer 2023-present
Lucy Revina, summer 2023
Alexis Kim, fall 2022-spring 2023. Product designer @ Garmin
Cindy Tung, summer 2022-spring 2023. PhD student @ Cornell University
Ritik Batra, spring 2021. PhD student @ Cornell University
Ankita Morari, summer 2021
Cici Wei, 2020-2021
Michelle Gantos, 2020-2021