KATHERINE W. SONG

http://kwsong.github.io
425-829-2770 • kwsong at berkeley.edu

EDUCATION:

- **Ph.D. student, University of California - Berkeley**, Berkeley, CA, 2019-present
  Department of Electrical Engineering and Computer Science (area of concentration: human-computer interaction)
  Coursework highlights: Computer Graphics, Computer Vision, Data Visualization, Algorithmic Human-Robot Interaction
- **S.M., Massachusetts Institute of Technology**, Cambridge, MA, 2013
  Department of Electrical Engineering and Computer Science (EECS).
  Major: electronic materials and devices; Minor: biological and health sciences
  Completed Ph.D. qualifying exam requirements, coursework, and teaching (2011-2014).
- **B.S.E. with Highest Honors**, **Princeton University,** Princeton, NJ, 2011
  Major: electrical engineering; Certificates (minors): materials science, applications in computing

WORK EXPERIENCE:

- **Display Electrical Engineer**, Apple Inc., February 2015-October 2017
  Manager: Dr. Marc DeVincentis
  Responsibilities:
  - Direct Responsible Individual (DRI) for design, from conception to mass production, of iPhone X display rigid flex PCB
  - DRI for iPhone X and Watch 2 failure analysis during assembly, software bring-up, and reliability testing at factory sites
  - Prototyping and collaboration with external vendors to develop new display and module packaging technologies

RESEARCH EXPERIENCE:

- **Graduate Research Fellow**, Hybrid Ecologies Lab, UC Berkeley, June 2019-present
  Adviser: Professor Eric Paulos
  - Develop digital fabrication design workflows and materials for "un-making" - the destruction of tangible artifacts
  - Develop tangible interfaces to support the "slow" aspects of friendship
- **Graduate Research Fellow**, MIT Media Lab & Charles Stark Draper Laboratory, May 2013-December 2014
  Advisers: Professor Hugh Herr (MIT Media Lab), Dr. Bryan L. McLaughlin (Draper Laboratory)
  - Designed and fabricated an implantable peripheral nerve microchannel interface for bi-directional prosthesis control
- **Graduate Research Fellow** (S.M. research), MIT, August 2011-May 2013
  Adviser: Professor Vladimir Bulovic, Department of Electrical Engineering and Computer Science
  - Invented an electrophoretic deposition technique to form thin layers of core-shell quantum dots for light emitting devices
  - Fabricated and studied record-efficiency near-infrared LEDs using core-shell PbS-CdS quantum dots
- **Visiting Researcher**, Palo Alto Research Center, Palo Alto, CA, Summer 2010
  Host: Dr. Robert A. Street, Senior Research Fellow
  - Characterized and modeled organic bulk heterojunction and silicon nanowire solar cells
- **Undergraduate Researcher**, Princeton University, Princeton, NJ, Jan. 2009-May 2011
  Advisers: Professors Sigurd Wagner and Naveen Verma, Department of Electrical Engineering
  - Fabricated a top-gate staggered thin-film transistor structure using a new hybrid material as a gate dielectric
  - Characterized mechanical flexibility of TFTs made with the new gate dielectric on a plastic substrate
  - Designed and fabricated an amorphous-Si-based circuit to serve an interface between large-area sensing sheets and nanoscale integrated circuit chips for a structural health monitoring application
- **Research Experience for Undergraduates (REU) Participant,** Carnegie Mellon University, Pittsburgh, PA, Summer 2008
  Adviser: James W. Schneider, Professor, Department of Chemical Engineering
  - Sorted semi-conducting vs. conducting carbon nanotubes via DNA-surfactant tagging and capillary electrophoresis

TEACHING EXPERIENCE:

- **Instructor**, Online SAT Essay Course, Fall 2018
  Taught class of 30 students in Singapore how to write the SAT Essay and improve their ability to read/write argument
- **Teaching Assistant**, MAS.600: Human 2.0, Spring 2014
- **Laboratory Assistant**, ELE208: Fundamentals of Semiconductor Devices, Spring 2011
- **Teaching Assistant**, ELE302: Systems Design and Analysis, Spring 2011
- **Writing Center Fellow,** Princeton University Writing Program, Fall 2008-Spring 2011
  One of ~50 selected undergraduate and graduate student fellows
  Advised students on writing and oral presentations varying in topic and discipline
- **Peer Tutor**, Princeton University Office of the Dean of College, Fall 2009-Spring 2011
  Offered assistance for 9 technical classes in engineering, math, physics, and computer science

HONORS & AWARDS:

- **Berkeley Graduate Division BEARGradS Award**, 2019
  Awarded to 1 new admit in the EECS department every year
- **Berkeley Fellowship**, 2019
- **National Defense Science and Engineering Graduate Fellowship**, 2019-present
- **National Science Foundation Graduate Research Fellowship**, 2011-2014
- **Massachusetts Institute of Technology Henry Ford II Fellowship**, 2011-2012
- **Hertz Foundation Fellowship Finalist** (1 of 50 out of pool of ~600), January 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 Bldg. 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 & devices."
- **Princeton Program in Materials Science and Engineering Outstanding Materials Student Award,** May 2011
  "PRISM's highest undergraduate honor, the 'Outstanding Materials Student Award' recognizes the combined excellence in academics, research, and dedication to materials science."
- **Princeton School of Engineering and 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."
- **Academic Honor Societies:** Phi Beta Kappa (inducted as top 10% of graduating class), Sigma Xi, Tau Beta Pi (inducted as top $1/8^{th}$ of junior class), Spring 2011
- **Barry M. Goldwater Scholarship,** April 2010
- **Princeton University Shapiro Prize for Academic Excellence,** September 2008
- **Princeton Physics Department Manfred Pyka Memorial Physics Prize**, June 2008
- **U.S. Department of Education Robert C. Byrd Honors Scholarship**, 2007-2011
- **National Merit Scholarship**, 2007

LEADERSHIP AND SERVICE (ACADEMIC):

- **Co-chair**, 2013 MIT Microsystems Technology Laboratories Annual Research Conference (MARC2013)

Led the planning and execution of a ~300-attendee, student-run annual conference
Spearheaded the introduction of new types of technical presentations and interactive fun/educational opportunities

- **Vice-President**, Tau Beta Pi (engineering honor society) – New Jersey Delta chapter, Jan. 2010-May 2011
  Served on the Committee for Financial Affairs as the chapter's voting delegate at the national TBP convention
- **Design Team Captain** and **Vice-President**, Int'l Assoc. for Hydrogen Energy – Princeton Chapter, 2010-2011
  Led design of a solar-powered hydrogen generator for the first annual IAHE design competition – **placed 1st**
  Recruited speakers for seminar series
- **Co-President**, **Head of Layout/Publishing, Business Team**, *Princeton Science in Society* journal, 2007-2011
  Led publicity efforts and organized speaker and film screening events
  Oversaw and managed layout process for biannual issues and worked out contracts with publishing companies
  Applied for funding and found sponsors to cover publication costs
- **Co-President** (2010-2011) **and Secretary** (2009-2010), Princeton University Materials Research Society
  Helped organize a "Making Stuff" event as part of a PBS educational series
  Organized dinner talks, study breaks, tours of regional companies and laboratories, etc.
- **Undergraduate Representative**, Princeton Imaging and Analysis Center Users Committee, 2009-2011
  Helped make decisions related to imaging equipment purchases and usage
- **Mentor**, Princeton University Society of Women Engineers, Fall 2009-Spring 2011
  Assisted underclassmen women engineers with course selection, study strategies, etc.

LEADERSHIP AND SERVICE (COMMUNITY):

- **Volunteer**, Berkeley Humane Society, Nov. 2019 - Mar. 2020
  Supported the maintenance and operations of cat and dog adoptions
- **Technical Mentor**, FIRST Robotics Competition Team #7419, Sep. 2018 - Sep. 2019
  Guided the robot design and program management for the first FRC team for Quarry Lane HS (Dublin, CA)
- **Volunteer**, Nepal Volunteers Council, Kathmandu, Nov 2016
  Set up a computer lab for a school in Kathmandu, Nepal by repairing donationed units and salvaging parts
- **Bursar, Hiking Leader, Winter School Leader, Climbing Leader**, MIT Outing Club, 2012-2014
  Managed incoming finances, prepared annual budget, voted on club initiatives
  Led club hiking/climbing trips to various locations in the Northeast
- **Princeton Engineering School Tour Guide and Coordinator**, Jan. 2010-May 2011
  Led visitor tours of the School of Engineering and Applied Science 1-2 times per week

REFEREED PUBLICATIONS & CONFERENCE PROCEEDINGS:

1. **Katherine W. Song** and Eric Paulos, "Unmaking: Enabling and Celebrating the Creative Material of Failure, Destruction, Decay, and Deformation," In *Proceedings of CHI2021* (to appear).
2. 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).
3. 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).
4. 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).
5. **Katherine W. Song**, Ronny Costi, and Vladimir Bulović, "Electrophoretic deposition of CdSe/ZnS quantum dots for light emitting devices," *Advanced Materials* 25(10) (2013).
6. 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," *VLSI Symp. Circuits* (2012).

7. 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).
8. 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).
9. 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).
10. 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).
11. 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).
12. 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).
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).
14. **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).

CONFERENCE PRESENTATIONS:

1. **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 (poster).
2. **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 (poster).
3. Robert Street, **Katherine Song**, and Alexa Krakaris, "Localized state spectroscopy in organic solar cells," *MRS Fall Meeting*, Boston MA. 28 Nov 2011.
4. 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.
5. **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.
6. 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.
7. 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.
8. 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.
9. **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.
10. 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.
11. 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.
12. **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.

PATENTS:

1. 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).
2. 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).
3. 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).
4. Vladimir Bulović, **Katherine W. Song**, and Ronny Costi, "Deposition of semiconductor nanocrystals for light emitting devices," US Patent 9,472,723 (2016).

SKILLS:

- **Laboratory**: 3D printing; laser cutting; PDMS/silicone microstructure molding and assembly; integrated circuits design, fabrication, and evaluation (laser mask writing, PECVD, thermal/e-beam evaporation, sputtering, mask alignment/lithography, reactive ion etching, wet etching [including HF], parameter analyzer testing); scanning electron microscopy and focused ion beam milling; atomic force microscopy; profilometry; fluorescence and absorbance spectrophotometry; capillary electrophoresis; dynamic light scattering; mechanical testing; general metal and wood shop (mills, routers, lathes, grinders); general wet lab (pipetting, spin casting, purification, cell culture, PCR, etc.).
- **Computing:** MATLAB, Python, C++, C, Java/J#, Javascript, HTML, CSS, LaTeX, Git. Basic experience in OpenGL, Verilog, Mathematica, assembly (IA-32 architecture; DSP5680x microprocessor)
- **Digital Design:** CAD (Fusion360, SketchUp, nd AutoCAD), Adobe Illustrator/InDesign/Photoshop, circuit simulation and PCB layout software (L-Edit, Cadence, SPICE, Nanosim).
- **Foreign Languages:** Mandarin Chinese (basic) and Spanish (intermediate)
- **Outdoors**: Wilderness First Aid, AIARE I, climbing self-rescue, glacier travel, and crevasse rescue