

JENNIFER WANG

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EDUCATION

University of California, Berkeley

Ph.D. Engineering, Science, and Math Education :: May 2014

Thesis: *Engineering Learning: Cross-Community Design, Development, and Implementation of Engineering Design Challenges at a Science Center*

Committee: Alice M. Agogino, Lisa A. Pruitt, Marcia C. Linn, Michael J. Clancy

M.S. Mechanical Engineering, Emphasis in Design :: December 2011

Thesis: *Engineering Learning at a Science Center*

Committee: Alice M. Agogino, Lisa A. Pruitt, Marcia C. Linn

B.S. Electrical Engineering and Computer Sciences with Honors, Music Minor :: May 2009

Courses:

Education & Research

Practicum in Science and Mathematics Education, Research, & Development

Designing Educational Technologies

Education Issues & Problem Solving in Engineering Education

Gender, Mathematics, & Science

Qualitative Methods

Quantitative Methods

Design

User Interface Design

Tangible User Interfaces

User Experience Research

New Product Development

Solid Modeling

Precision Manufacturing

Language of Drawing

Body-Conscious Design

Language of Sculpture

Electrical Engineering & Computer Science

Components and Design Techniques for Digital Systems

Computer Graphics

Mechatronics

Transducers

Systems and Signals

Quantum Mechanics

Solid State Physics

University of California Education Abroad Program in Language & Culture

University of Córdoba, Spain :: February – May 2008

Courses:

Advanced Intermediate Grammar

20th Century Spanish Literature and Cinema

Spanish Culture and Civilization

RESEARCH EXPERIENCE

Research Assistant :: Lawrence Hall of Science :: UC Berkeley :: June 2010 – present

- Oversee the implementation of new exhibits on engineering design
- Provide feedback to the exhibit team on public engagement and exhibit elements
- Assist in designing, developing, and refining content and implementation of engineering design educational programming
- Conduct observations and interviews and implement surveys to evaluate the educational effectiveness of engineering exhibits and programs
- Write and support academic work, including grant proposals and academic papers
- Train teen volunteers and staff members working at the exhibits and engineering education programs
- Work with other staff in organizing and managing teen volunteer and internship programs
- Collaborate with a university engineering class and Prof. Lisa Pruitt to facilitate and implement various challenges within the exhibits
- Manage novel collaboration with university engineering students, industry engineers, and informal educators to develop and implement new content for engineering program

TEACHING EXPERIENCE

- Research Assistant** :: Prof. Mike Clancy :: UC Berkeley :: June 2009 – May 2010
- Explored various methods to engage an interdisciplinary community in computer science education
 - Developed a website for collaboration on curriculum and support for each other through pedagogical patterns using the content management system Drupal

Undergraduate Researcher :: Profs. Alice Agogino, Kimiko Ryokai :: UC Berkeley :: January – May 2009

- Designed and created prototypes for an interactive map-based mobile device for use in education
- Studied various mobile platforms, including Android, and developed Java code for the Android phone
- Conducted user studies with the latest prototype

Research Apprentice :: Prof. James Siegrist :: UC Berkeley :: January – December 2007

- Developed programs for pattern recognition in particle physics using MATLAB
- Applied pattern recognition to the identification of multiple unknown tracks in a bubble chamber
- Evaluated a variety of pattern recognition techniques, including the Kalman filter

Research Intern :: Prof. William Kaiser :: UCLA :: June – August 2006

- Coordinated with a partner on a project for the Center for Embedded Networked Sensing
- Devised a method and designed a device for the automation of water sampling in rivers and lakes
- Created a rough prototype of the device
- Studied neural net algorithm for automation

Physics Teacher :: Compass Summer Program :: UC Berkeley :: May – August 2013

- Collaborate with a team of six teachers plus other Compass staff
- Develop physical sciences curriculum for two-week course for incoming UC Berkeley students
- Teach the course, integrating theory, experiments, and metacognition
- Interactively participate in teacher training and professional development

Teaching Assistant :: Intro to Computer Science :: UC Berkeley :: August – December 2009

- Led two lab sections, guiding and instructing students during lab and holding recitation sessions
- Graded and provided feedback on homework, quizzes, and exams

Teaching Associate :: Surviving Engineering :: UC Berkeley :: August – December 2008

- Led class for college freshmen on various topics concerning academics, career, and college responsibilities

OTHER PROFESSIONAL EXPERIENCE

Volunteer Mentor :: Emerson Elementary School :: Berkeley, CA :: September 2005 – May 2011

- Assist students one-on-one with math, writing, and reading
- Aid and monitor in classrooms while students are doing homework

Intern :: Exploratorium :: San Francisco, CA :: May – August 2009

- Developed and executed a two-day “Take-it-apart” electronics workshop for visitors
- Coordinated with staff members for logistics of the workshop
- Created the program and inventory for the workshop
- Organized and tagged data for the Exploratorium activities database

Math Tutor :: Supreme Educational Services :: Orinda, CA :: May – August 2009

- Individually mentored and tutored students at various levels of mathematics

CalTeach Volunteer :: Berkeley High School :: Berkeley, CA :: January – May 2009

- Supported and mentored students in geometry classes
- Observed teacher and coordinated with her on aspects of teaching

Math and Physics Tutor :: Academic Services :: UC Berkeley :: August 2006 - May 2009

- Guided and encouraged college students, tutoring them in various math and physics courses
- Managed several students at a time during drop-in tutoring sessions at residence halls

Technical Intern :: Lockheed Martin :: San Jose, CA :: June – August 2008

- Created data structure and algorithm for geolocation based on a product's connection to cell towers (US Patent Number 8,040,275)

English Tutor :: Córdoba, Spain :: February – May 2008

- Tutored one-on-one with a Spanish student through writing and reading exercises

Math Tutor :: Incentive Awards Pre-Collegiate Academy :: Berkeley, CA :: June – August 2007

- Tutored and assisted high school students in intensive six-week calculus courses

Math and Science Tutor :: Mission Viejo, CA :: March 2004 – June 2005

- Tutored one-on-one and aided high school students with homework and exams

English Teacher :: Taipei, Taiwan :: August 2003

- Developed curriculum, coordinated class schedule, and instructed the basics of English to middle school students

PROFESSIONAL TRAINING

Data Visualization Workshop :: Exploratorium in San Francisco, CA :: June 2011

- Participated in day-long workshop with other exhibit developers, scientists, and designers to address challenge of bringing scientific data visualizations to the public in museums
- Brainstormed and prototyped systems for interacting with Global Tagging of Pelagic Predators (GTOPP) geospatial dataset tracking oceanic predators

Teaching Techniques Course :: UC Berkeley :: August – December 2009

- Developed and presented a brief lesson, receiving peer and instructor feedback
- Learned various topics in teaching, such as handling student issues, grading, diversity, ethics, use of technology, preparation for and execution of labs and recitation, and incorporating student feedback

Teaching Conference :: UC Berkeley :: August 2009

- Participated in workshops on getting started in teaching, strategies to enhance learning, and time management
- Joined focus groups on creating lesson plans and developing oral communication skills

PROJECTS

Human Power Generation :: UC Berkeley :: May 2013 – current

- Researched and developed content for energy and sustainability campaign
- Designed signage for campaign, including posters, informational signs, and TV screens
- Assisted with increasing usability and access of retrofitted energy harnessing fitness equipment

Mookies :: UC Berkeley :: August – December 2011

- Designed and developed a tangible user interface using Arduino and Processing
- Coded algorithm for Mookies, tangible objects that record and play sounds for users to explore sonic properties of everyday objects
- Implemented Mookies in accordance with underlying theories for tangible user interfaces, including designing for open interpretation and ease of use through affordances

Race Across the Pacific :: Exploratorium, San Francisco, CA :: June 2011

- Participated in the Data Visualization Workshop hosted by the New Media Studio
- Collaboratively brainstormed designs for exhibits to engage public through visualization of scientific data from Global Tagging of Pelagic Predators (GTOPP) and NOAA
- Prototyped an embodied interaction (riding a stationary bicycle) for visitors to experience the distance traveled by the oceanic predators

Green Challenge :: UC Berkeley :: August – December 2010

- Developed an educational game for Waste Management to teach children about appropriate recycling practices
- Conducted user research with children, adults, and Waste Management to inform the product design
- Designed and produced three iterations of prototypes, each improved through analysis of feedback from user testing

Brightstorm :: UC Berkeley :: January – May 2010

- Conducted user experience research on an online tutoring website, Brightstorm
- Devised plans for and carried out user tests, interviews, and surveys
- Analyzed data from the three methods, reporting findings and recommendations to Brightstorm

MySchool :: UC Berkeley :: January – May 2010

- Created a user interface for an educational game for mobile devices
- Pedagogically connected mathematical concepts with music concepts for children to encounter through interaction with the music-composing game
- Conducted contextual interviews and several user tests with various prototypes throughout the development process

myFermi :: UC Berkeley :: August – December 2009

- Produced two prototypes for a science education application for mobile devices
- Developed features of social collaboration and data collection using the affordances of mobile devices
- Carried out user testing on middle school and high school students

PRESENTATIONS & PUBLICATIONS

Wang, J., Lawrence, J., Harris-Lovett, S., Charbonnet, J., Torkelson, A.A., Mayer, M., McLeod, P., & Hussain, F. (submitted). An interdisciplinary collaboration of scientists, engineers, and educators to co-design a water engineering challenge for a public science center.

Wang, J. & Agogino, A. (2014). Engineers, Students, and Educators Co-Design Learning Challenges for a Science Center. *Proceedings from the 121st American Society for Engineering Education Annual Conference & Exposition*. Indianapolis, IN.

Wang, J. (2014). Design Challenges at a Science Center: Are Children Engineering? Paper presented at the American Educational Research Association Annual Meeting. Philadelphia, PA.

Wang, J. & Agogino, A. (2013). Cross-Community Design and Implementation of Engineering Tinkering Activities at a Science Center. Paper presented at FabLearn 2013,

Digital Fabrication in Education Conference. Stanford, CA.

Mayer, M., Wang, J., & Hsi, S. (2013). The Evolution of Ingenuity Programs at the Lawrence Hall of Science. Paper presented at FabLearn 2013, Digital Fabrication in Education Conference. Stanford, CA.

Wang, J., Lawrence, J., Harris-Lovett, S., Torkelson, A.A., Charbonnet, J., Mayer, M., McLeod, P., & Hussain, F. (2013). "Design and Implementation of a Hands-On Water Engineering Challenge for a Public Science Center: An Interdisciplinary Collaboration of Scientists, Engineers, and Museum Staff." Poster presented at the 11th Biennial State of the San Francisco Estuary Conference. Oakland, CA.

Wang, J., Lawrence, J., Harris-Lovett, S., Torkelson, A.A., Charbonnet, J., Mayer, M., McLeod, P., & Hussain, F. (2013). "Design and Implementation of a Hands-On Water Engineering Challenge for a Public Science Center: An Interdisciplinary Collaboration of Scientists, Engineers, and Museum Staff." Poster presented at the 2013 Association of Environmental Engineering & Science Professors 50th Anniversary Conference. Golden, CO.

Wang, J. (2013). Ingenuity Lab: Making and Engineering through Design Challenges at a Science Center. *Proceedings from the 120th American Society for Engineering Education Annual Conference & Exposition*. Atlanta, GA. Design in Engineering Education Division Best Paper Finalist.

Ansari, F., Wang, J., Shelby, R., Patten, E., & Pruitt, L. (2013). A Follow-up Study of a First-Year Leadership and Service Learning Module. *Proceedings from the 120th American Society for Engineering Education Annual Conference & Exposition*. Atlanta, GA.

Wang, J. (2013). "Doing Engineering." Talk presented at the 2013 Applied Materials Clean Tech Competition. Santa Clara, CA.

Wang, J., Werner-Avidon, M., Newton, L., Randol, S., Smith, B., & Walker, G. (2013). Ingenuity in Action: Connecting Tinkering to Engineering Design Processes. *Journal of Pre-College Engineering Education Research*, 3(1), 1-21.

Shelby, R., Patten, E., Ansari, F., Pruitt, L., Walker, G. & Wang, J. (2013). Implementation of Leadership and Service Learning in a First-Year Engineering Course Enhances Professional Skills. *International Journal of Engineering Education*, 29(1), 85-98.

Wang, J. & Walker, G. (2013). Ingenuity in Action: Collaboration and Design at a Science Museum. *The International Journal of Design Education*, 6(1), 47-62.

Wang, J. (2012). "Ingenuity Programs: Increasing Access and Interest in Engineering through Tinkering." Talk presented at an All-Hall Learning Event. Lawrence Hall of Science, UC Berkeley.

Wang, J. (2012). "Ingenuity Lab: Making and Engineering through Design Challenges at a Science Center." Poster presented at the Global Technology Leaders Conference. College of Engineering, UC Berkeley.

Wang, J., Patten, E., Shelby, R., Ansari, F., and Pruitt, L. (2012). Leadership and Service Learning Improves Confidence of Engineering Skills in Women. *Proceedings from the 119th American Society for Engineering Education Annual Conference & Exposition*. San Antonio, TX. Denise Dee Denton Best Paper Award.

Wang, J. (2011). "Ingenuity in Action: Connecting Tinkering to the Engineering Design Process." Poster presented at the UC Berkeley Graduate School of Education Research Day.

Wang, J. (2010). "MyFermi: Doing real science while collaborating on a mobile device." Poster presented at the UC Berkeley Graduate School of Education Research Day.

Wang, J., Kayler, A., Lee, S. & Turner, D. (2010). "mySchool Music: an iPhone app for learning fractions while making music!" Poster presented at the UC Berkeley User Interface Design Poster Session.

Wang, J. & Zendejas, I. (2006). "Robotic Physical Sampling." Poster presented at the CENS

Research Program Poster Session. University of California, Los Angeles.

ACADEMIC SOCIETIES

Member, *American Educational Research Association*

Member, *American Society for Engineering Education*

Member, *Tau Beta Pi: Engineering Honor Society*

Member, *Eta Kappa Nu: Electrical Engineering and Computer Science Honor Society*

External President (2007), Historian (2006), *Association of Women in Electrical Engineering and Computer Science*

Committee Chair (2007), *Society of Women Engineers*

FELLOWSHIPS & HONORS

Mara H. Wasburn Early Engineering Educator Grant from the Women in Engineering Division of the American Society for Engineering Education (ASEE) :: 2013

Design in Engineering Education Division Best Paper Finalist for ASEE paper "Ingenuity Lab: Making and Engineering through Design Challenges at a Science Center" :: 2013

Denice Dee Denton Best Paper Award for ASEE paper "Leadership and Service Learning Improves Confidence of Engineering Skills in Women" :: 2012

Graduate Scholar Award Winner at the Sixth International Conference on Design Principles and Practices :: 2012

UC Berkeley Graduate Division Fellowship :: 2010-2012

PATENTS

Ronald, D.S., Stevens, T.D., Quintana, P.A., and Wang, J. (2011). Method and apparatus for geographic positioning. US Patent Number 8,040,275.

TECHNICAL SKILLS

Programming languages: Python, Java, C/C++, Processing, Arduino, HTML, CSS, MATLAB, Scheme (Lisp), MIPS, Labview, Verilog

Software: Photoshop, Illustrator, InDesign, Word, Excel, PowerPoint, SolidWorks, Tableau, ModelSim

Operating systems: Windows, UNIX, Mac OS X

Machine shop: lathes, milling machines, drill presses, belt sanders, band saws, chop saws

LANGUAGES

Fluent in **Mandarin Chinese**

Conversational in **Spanish**