

## Research Interests

My research focuses on human-computer interaction and visualization. I am particularly excited about building visualization for complex artificial intelligence (AI) systems and machine learning (ML) models. Specially, I work on interactive visualization and visual analytics for AI/ML developers to explore and understand data in AI/ML development workflows for finding directions for further improvement.

## Education

- 2013 – Present **Ph.D. in Human Centered Design & Engineering, University of Washington**  
Advisor: Prof. Cecilia R. Aragon  
Committee members:  
Dr. Been Kim (Google & UW CSE), Prof. Andrew J. Ko (UW iSchool), Prof. Gary Hsieh (UW HCDE)
- 2008 – 2013 **B.S. in Computer Science and Information Engineering, National Taiwan University**  
Minor in Psychology  
Advisor: Prof. Hao-Hua Chu

## Awards & Honors

- 2016 **Intern of the Year, Allen Institute for Artificial Intelligence (AI2)**  
Only one recipient per year
- 2014 **Microsoft Research Graduate Women's Scholarship, Microsoft Research (MSR)**  
Recognizes outstanding 1st year female PhD students
- 2011 **Google Anita Borg Memorial Scholarship, Google, Inc.**  
Recognizes female engineers with excellent academic performance and strong leadership skills
- 2011 – Present **Hsing Tian Kong Long-Term Fellowship for Cultivating Elite Students, Hsing Tian Kong Temple**  
Fellowship to support elite students with acceptance rate of 0.1%
- 2011, 2012 **Irving T. Ho Memorial Scholarship, Irving T. Ho Memorial Foundation**  
Recognizes undergraduate in EECS with excellent academic performance (3 recipients a year)
- 2008 – 2012 **Presidential Award, National Taiwan University**  
Recognizes top 5% students in the Department of Computer Science and Information Engineering  
(Received 5 times: Fall 2008, Spring 2009, Fall 2009, Fall 2011, Spring 2012)
- 2009 **Ninth Place Award, ACM International Collegiate Programming Contest, Asia Regional**  
Ninth place out of 45 teams from various Asian countries

## Publications

———— Conference Papers

- 2018 **AnchorViz: Facilitating Classifier Error Discovery through Interactive Semantic Data Exploration**  
*Nan-Chen Chen, Jina Suh, Johan Verwey, Gonzalo Ramos, Steven Drucker, and Patrice Simard*  
IUI'18: ACM International Conference on Intelligent User Interfaces [[pdf](#)]
- 2018 **Grounding Interactive Machine Learning Tool Design in How Non-Experts Actually Build Models**  
*Qian Yang, Jina Suh, Nan-Chen Chen, Gonzalo Ramos*  
DIS'18: ACM SIGCHI Conference on Designing Interactive Systems [[pdf](#)]
- 2017 **QSAnglyzer: Visual Analytics for Prismatic Analysis of Question Answering System Evaluations**  
*Nan-Chen Chen, Been Kim*  
VAST'17: IEEE Conference on Visual Analytics Science and Technology [[pdf](#)]
- 2017 **SparQs: Visual Analytics for Sparking Creativity in Social Media Exploration**  
*Nan-Chen Chen, Michael Brooks, Rafal Kocielnik, Sungsoo (Ray) Hong, Jeff Smith, Sanny Lin, Zening Qu, and Cecilia Aragon*  
HCI International'17: International Conference on Human-Computer Interaction [[pdf](#)]
- 2017 **Aeonium: Visual Analytics to Support Collaborative Qualitative Coding**  
*Margaret Drouhard, Nan-Chen Chen, Jina Suh, Rafal Kocielnik, Vanessa Pena-Araya, Keting Cen, Xiangyi Zheng, and Cecilia R. Aragon*  
PacificVis '17: IEEE Pacific Visualization Symposium [[pdf](#)]
- 2017 **Lariat: A Visual Analytics Tool for Social Media Researchers to Explore Twitter Datasets**  
*Nan-Chen Chen, Michael Brooks, Rafal Kocielnik, Ray Hong, Zening Qu, Jeff Smith, Sanny Lin, Cecilia Aragon*  
HICSS'17: Hawaii International Conference on System Sciences, Data Analytics and Data Mining for Social Media Minitrack [[pdf](#)]
- 2016 **Considering Time in Designing Large-Scale Systems for Scientific Computing**  
*Nan-Chen Chen, Sarah S. Poon, Lavanya Ramakrishnan, Cecilia R. Aragon*  
CSCW'16: ACM Conference on Computer-Supported Cooperative Work and Social Computing [[pdf](#)]
- 2014 **Thermalprobe: Exploring the use of thermal identification for per-user energy metering**  
*Chuang-Wen You, Hsin-Liu Kao, Bo-Jhang Ho, Nan-Chen Chen, Yi-Hsuan Hsieh, Polly Huang, Hao-Hua Chu*  
GreenCom'14: IEEE International Conference on Green Computing and Communications [**Best Paper Award**] [[pdf](#)]
- 2011 **HeatProbe: a thermal-based power meter for accounting disaggregated electricity usage**  
*Bo-Jhang Ho, Hsin-Liu Kao, Nan-Chen Chen, Chuang-Wen You, Hao-Hua Chu, and Ming-Syan Chen*  
Ubicomp'11: ACM International Conference on Ubiquitous Computing [[pdf](#)]

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Journal Papers

- 2018 **Using Machine Learning to Support Qualitative Coding in Social Science: Shifting The Focus to Ambiguity**  
*Nan-Chen Chen*, Margaret Drouhard, Rafal Kocielnik, Jina Suh, Cecilia R. Aragon  
ACM TiS Special on Human Centered Machine Learning [[pdf](#)]
- 2017 **Emoticons in Informal Text Communication: A New Window on Bilingual Alignment**  
Laurie Beth Feldman, Cecilia R. Aragon, *Nan-Chen Chen*, and Judith F. Kroll  
Bilingualism: Language and Cognition (Vol 21, Issue 1)
- 2017 **Toward the Operationalization of Visual Metaphor**  
Alexis Hiniker, Sungsoo (Ray) Hong, Yeaseul Kim, *Nan-Chen Chen*, Jevin West, Cecilia Aragon  
JASIST: Journal of the Association for Information Science and Technology

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Workshop Papers & Conference Posters

- 2016 **Challenges of Applying Machine Learning to Qualitative Coding**  
*Nan-Chen Chen*, Rafal Kocielnik, Margaret Drouhard, Vanessa Peña-Araya, Jina Suh, Keting Cen, Xiangyi Zheng and Cecilia R. Aragon  
HCML'16: CHI 16 Workshop on Human Centered Machine Learning [[pdf](#)]
- 2014 **Emoticons and Linguistic Alignment: How Visual Analytics Can Elicit Storytelling**  
*Nan-Chen Chen*, Laurie Beth Feldman, Judith F. Kroll, Cecilia R. Aragon  
VIS'14: IEEE Conference on Visualization [[pdf](#)]
- 2014 **Establishing common ground in informal text communication: Emoticon use in first and second languages**  
*Nan-Chen Chen*, Laurie Beth Feldman, Judith F. Kroll, Cecilia R. Aragon  
Conference on Finding Common Ground: Social, Ecological, and Cognitive Perspectives on Language Use [[pdf](#)]
- 2014 **Emoticon and Text Production in First and Second Languages in Informal Text Communication**  
Cecilia R. Aragon, *Nan-Chen Chen*, Judith F. Kroll, Laurie Beth Feldman  
SBP'14: International Social Computing, Behavioral Modeling and Prediction Conference [[pdf](#)]
- 2012 **Listen-to-nose: a low-cost system to record nasal symptoms in daily life**  
*Nan-Chen Chen*, Kuo-Cheng Wang, and Hao-Hua Chu  
UbiComp'12: ACM International Conference on Ubiquitous Computing [[pdf](#)]
- 2011 **HeatProbe: a thermal-based power meter System for tracking per-user power consumption**  
*Nan-Chen Chen*, Bo-Jhang Ho, Hsin-Liu Kao, Chuang-Wen You, Hao-Hua Chu, and Ming-Syan Chen  
Pervasive'11: International Conference on Pervasive Computing [[pdf](#)]

## Research Experience & Internships

- Summer 2017 **Research Intern, Microsoft Research (MSR)**  
Supervisor: Jina Suh, Machine Teaching Group  
Designed and built interactive visualization for exploration tasks in machine learning
- Summer & Autumn 2016 **PhD Intern, Allen Institute for Artificial Intelligence (AI2)**  
Supervisor: Dr. Been Kim  
Used human-centered design process to design and build a visual analytics tool called *QSAnglyzer* for Question Answering System developers at AI2. The system has been well-received by the target users and adopted into their workflows. I received the Intern-of-the-Year award for this work.
- Summer 2015 **PhD Intern, Pacific Northwest National Laboratory (PNNL)**  
Supervisors: Erin Fitzhenry, Dr. George Jr. Chin  
Used human-centered design process to build a visual analytics tool for comparative analysis on power grid simulation outputs
- 2014 – 2017 **Research Assistant, Human-centered Data Science Lab, University of Washington**  
Supervisor: Prof. Cecilia R. Aragon  
Applying ethnography to study scientific workflows in high-performance computing
- 2010 – 2013 **Research Assistant, Ubiquitous Computing Lab, National Taiwan University**  
Supervisor: Prof. Hao-Hua Chu  
Worked on sensing in energy and health related topics
- 2009 – 2013 **Programming Research Assistant, National Taiwan University**  
Supervisor: Prof. Zhao-Ming Gao  
Wrote programs for computational linguistics projects

## Service and Extracurricular Experience

- Autumn 2017 **Teaching Assistant, University of Washington**  
TA for Prof. Sean Munson's Interactive Systems Design and Technology (HCDE 310) class
- 2012, 2016, 2017 **Student Volunteer (UbiComp 2012 / CSCW 2016 / SIGCSE2017 / VIS 2017)**  
Helped prepare the conference and assisted session chairs with logistics
- 2012 – 2013 **Teaching Assistant, National Taiwan University**
- Introduction to Computer Programming (CSIE1921), Spring 2013
  - Introduction to Computer Programming (CSIE1210), Fall 2012
  - Algorithm Design and Analysis (CSIE2136), Fall 2012
- 2013 **Founder and Chief Organizer of NTU CSIE Sprout Training Program, National Taiwan University**  
Offered training courses to senior high school students around Taiwan to advance programming and problem-solving skills. (official website: <http://www.csie.ntu.edu.tw/~sprout>)

- Fall 2009 **Member of the Training Program for ACM International Collegiate Programming Contest (ACM/ICPC), National Taiwan University**  
Trained as contestants for ACM/ICPC contests
- 2008 – 2013 **Informatics Contest Coach, Taipei First Girls' Senior High School**  
Coached contestants for International Olympiad in Informatics
- Fall 2010 **President, National Taiwan University Toastmasters Club**  
Helped members cultivate leadership and communication skills

## Proficiency and Other Experience

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### Skills

- Programming Languages:  
C & C++ languages, JavaScript (experienced in native JS & frameworks like Angular.js, React.js, Node.js and Backbone.js, and visualization libraries like D3.js), Python (both native Python & Django framework), TypeScript, Perl, Java, PHP, MySQL/PostgreSQL, HTML/CSS
- User Experience Design & Research:  
Observations, Interviews, Ethnography, Formative Studies, Participatory Design, Wireframes & Prototyping, Visual Design (Photoshop & Illustrator), Experiment Design, Qualitative Evaluation, Statistics, Qualitative Analysis
- HCI Specialization: Visualization / Visual Analytics

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### Languages

- English (fluent), Mandarin Chinese (native), Japanese (JLPT N3 passed)
- Four-year membership in Toastmasters International Club, an international club that cultivates public speaking skills

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### Teaching

- More than 6 years of experience teaching C/C++ languages to over 100 female students.
- Experienced in teaching data structures and algorithms (see course materials at <http://nanchen.csie.org>)