

# DREW PAINE

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## Curriculum Vitae

### Overview

I am an ethnographer with over eight years of experience who is trained in software engineering and project management. I study the collaborative work practices of expert stakeholders (domain and data scientists) creating and using ecosystems/infrastructures of software and data. My research supports the design of practices, products, and policies by collecting data using interviews, surveys, observations, and artifacts.

### Education

**University of Washington** Seattle, WA  
Doctor of Philosophy, *Human Centered Design & Engineering (HCDE)* Sept 2010 - Aug 2016  
Advised by Dr. Charlotte P. Lee

**University of Washington** Seattle, WA  
*Master of Science, Human Centered Design & Engineering (HCDE)* Sept 2010 - Mar 2012

**Rose-Hulman Institute of Technology** Terre Haute, IN  
*Bachelor of Science, Software Engineering cum laude* Aug 2006 - May 2010  
*Minor in Economics*

### Professional Experience

#### Research Experience

##### Computer Science Post-Doctoral Researcher

##### Data Science & Technology Department, Usable Software Systems Group

##### Lawrence Berkeley National Laboratory

Berkeley, CA Aug 2017 - Present

- Conducted ethnographic and user research of scientific software ecosystems to produce insights for designing products used in high performance computing environments
- Designed and conducted ethnographic inquiry of scientific data change to better characterize cultures around the materials of knowledge production in different disciplines
- Designed and conducted usability tests of alpha version of a scientific data change calculation tool to inform the direction of the tool & overarching project
- Providing UX consulting to other Berkeley Lab and affiliated science teams to evaluate workshops, products, etc. as needed for areas to improve

##### Post-Doctoral Research Associate & Laboratory Manager

##### Computer Supported Collaboration Laboratory

Seattle, WA Oct 2016 - July 2017

- Conducted qualitative data analyses using interview, survey, and artifact data for three NSF-funded projects on scientific collaboration and software development
- Mentored an undergraduate & two doctoral students in qualitative data analysis and manuscript writing while managing general laboratory business including all IRBs
- Co-authored three National Science Foundation grant proposals, including developing research aims, literature reviews, study designs, and broader impacts

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## **Graduate Research Assistant & Laboratory Manager Computer Supported Collaboration Laboratory**

Seattle, WA

Sept 2010 - Sept 2016

- Studied the software development practices of scientists working with big data & cyberinfrastructure, seeking to better explain how individuals without formal software training develop software infrastructures and ecosystems to meet their research goals.
- Designed and led day-to-day activities for two longitudinal National Science Foundation funded projects for over 5 years
- Conducted qualitative data collection and analysis on three additional projects including the development of cyberinfrastructure middleware software, educational outreach in cyberinfrastructure projects, and coordination centers in cancer epidemiology involving surveys, interviews, observations, and artifacts
- As CSC Laboratory Manager I:
  - Managed Institutional Review Board (IRB) human subjects processes including applications, annual reports, and closures
  - Wrote National Science Foundation project reports & grant proposals
  - Mentored graduate and undergraduate students

## **Graduate Research Assistant Laboratory for Human-Centered Engineering Education (LHCEE)**

Seattle, WA

June 2011 - June 2015

- Worked with Dr. Jennifer Turns on an interdisciplinary team conducting the “Implications for Practice” research study to characterize how research findings are being presented as actions for educational practice in engineering education
- Facilitated multiple rounds of qualitative data production and document analysis of a selected literature
- Co-authored multiple publications and a procedure for translating research findings to educational practice (A5, A4, A2, & C3, below)

## *Teaching Experience*

### **Teaching Assistant, Human Centered Design & Engineering**

Seattle, WA

Mar 2012 - June 2012

- Served as teaching assistant for HCDE 502 ‘Empirical Traditions’ Professional Masters course with Dr. Jennifer Turns with 25 students
- Helped re-design the course to enable students to examine and digest different forms of empirical research and examine the implications for practice from published academic research
- Designed and helped grade assignments, as well as provided students with feedback during class discussions

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## Lab Instructor, University of Washington College of Engineering STEM Bridge Program

Seattle, WA

August 2012

- Taught four incoming freshman engineering students from minority & underrepresented populations about human-centered design and qualitative research over seven half-day sessions
- Designed curriculum, lectured, and mentored students in field observations, interviewing, qualitative data analysis, and rapid prototyping for a mobile app project
- Facilitated their interaction with stakeholders from Museology, UX industry, and the Henry Art Gallery

## Undergraduate Software Engineering & Project Management Experience

### Intern Project Manager, Rose-Hulman Ventures

Terre Haute, IN

Feb 2010 - May 2010

- Assisted a Senior Project Manager and other senior management developing design prototypes to better position Rose-Hulman Ventures on the web
- Developed and delivered a functioning prototype website for evaluation by staff and management using PHP and web standards while supervising & collaborating with a freshman software engineering intern

### Intern Project Manager, Rose-Hulman Ventures

Terre Haute, IN

Feb 2009 - Feb 2010

- Contracted by an external vendor with feature enhancement of a major tax assessment and records storage solution used by counties in the State of Indiana
- Executed multiple feature enhancements, culminating in a major version revision and successful certification of the new version by the State of Indiana
- Led the design and integration of new features required by the client in the Java/Apache Tomcat based system
- Managed client relations, scheduling and prioritization of project tasks, and completing feature implementation tasks
- Managed five Junior and Senior level student interns

### College Student Technical Senior, Lockheed Martin Maritime Systems & Sensors

Manassas, VA

May 2008 - Aug 2008

- Performed new feature integration and testing across multiple product lines as member of the Systems Integration & Test team within Undersea Systems
- Implemented feature requests and bug fixes in support of feature testing and build release on enterprise Linux systems in a Java & C++ (primarily Java focused) environment
- Executed multiple features & bug fixes in advance of a major build release to the client while participating on an intern team building an ocean thermal energy conversion demonstration testbed that was presented to executive management

*Note: A U.S. Secret clearance was required & obtained for this job*

## Thesis

T1 — **Paine, D.** (2016). *Software and Space: Investigating How a Cosmology Research Group Enacts Infrastructure by Producing Software*. University of Washington, Doctoral Dissertation. <http://hdl.handle.net/1773/36979>

## Archival Publications

A13 — **Paine, D.** & Ramakrishnan, L. (2019). Surfacing Data Change in Scientific Work. In: Taylor N., Christian-Lamb C., Martin M., Nardi B. (eds) Information in Contemporary Society. iConference 2019 Proceedings. Lecture Notes in Computer Science, vol 11420. DOI: [https://doi.org/10.1007/978-3-030-15742-5\\_2](https://doi.org/10.1007/978-3-030-15742-5_2)

A12 — Randall, D. P., **Paine, D.**, & Lee, C. P. (2018). Educational Outreach & Stakeholder Role Evolution in a Cyberinfrastructure Project. Paper presented at the 2018 IEEE 14th International Conference on e-Science, Amsterdam, Netherlands. DOI: <https://doi.org/10.1109/eScience.2018.00035>

A11 — **Paine, D.** and Lee, C. P. (2017). "Who Has Plots?": Contextualizing Scientific Software, Practice, and Visualizations. Proc. ACM Hum.-Comput. Interact. 1, CSCW, Article 85 (November 2017), 21 pages. DOI: <https://doi.org/10.1145/3134720>

A10 — Turns, J., Arif, A., **Paine, D.**, & Sattler, B. (2015). *Interpreting implications for practice from a design perspective*. In 6th Research in Engineering Education Symposium: Translating Research into Practice, REES 2015. Dublin Institute of Technology.

A9 — **Paine, D.**, Sy, E., Piell, R., & Lee, C. P. (2015). *Examining Data Processing Work as Part of the Scientific Data Lifecycle: Comparing Practices Across Four Scientific Research Groups*. Paper presented at the 2015 iConference, Newport Beach, CA, USA. DOI: <http://hdl.handle.net/2142/73644>

A8 — Lee, C. P., & **Paine, D.** (2015). *From The Matrix to a Model of Coordinated Action (MoCA): A Conceptual Framework of and for CSCW*. Proceedings of the 2015 conference on Computer Supported Cooperative Work & Social Computing (CSCW). Vancouver, BC. ACM. DOI <https://doi.org/10.1145/2675133.2675161>

A7 — Rolland, B., **Paine, D.**, & Lee, C. P. (2014). *Work Practices in Coordinating Center Enabled Networks (CCENs)*. In the Proceedings of the 18th International Conference on Supporting Group Work (GROUP 2014), Sanibel Island, Florida, USA. DOI: <https://doi.org/10.1145/2660398.2660408>

A6 — **Paine, D.**, & Lee, C. P. (2014). *Producing Data, Producing Software: Developing a Radio Astronomy Research Infrastructure*. Paper presented at the IEEE 10th International Conference on e-Science (e-Science 2014), Guarujá, SP, Brazil. DOI: <https://doi.org/10.1109/eScience.2014.41>

A5 — Turns, J., **Paine, D.**, & Sattler, B. (2014). *Practical implication in engineering education: Who is supposed to do what?*. Paper presented at the Frontiers in Education Conference (FIE), October 22-25, 2014, Madrid, Spain. DOI: <https://doi.org/10.1109/FIE.2014.7044351>

A4 — Turns, J., Sattler, B., Mobernd, K., & **Paine, D.** (2014). *Connecting Research to Action: A Useful Procedure*. Paper presented at the American Society for Engineering Education (ASEE) 2014 Conference, June 15-18, 2014, Indianapolis, IN. **2014 ASEE Student Division Best Paper Aware Winner.**

A3 — Bietz, M. J., **Paine D.**, & Lee, C. P. (2013). *The work of developing cyberinfrastructure middleware projects*. Proceedings of the 2013 conference on Computer Supported Cooperative Work (CSCW). San Antonio, Texas, USA, ACM: 1527-1538. DOI: <https://doi.org/10.1145/2441776.2441950>

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A2 — Turns, J., **Paine, D.**, Sattler, B., & Munoz, D. (2012). *What are the implications for teaching? An analysis of how educational implications are represented in engineering education*. Paper presented at the Frontiers in Education Conference (FIE), Oct. 3-6, 2012, Seattle, WA, USA. DOI: <https://doi.org/10.1109/FIE.2012.6462437>

A1 — Lee, C. P., Bietz, M.J., Derthick, K., & **Paine, D.** (2012). *A Sociotechnical Exploration of Infrastructural Middleware Development*. Proceedings of the 2012 ACM Conference on Computer Supported Cooperative Work (CSCW). **Best Paper Award Nominee**. DOI: <https://doi.org/10.1145/2145204.2145404>

## Book Reviews and Technical Reports

B3 — **Paine, D.** (2015). *Book Review The Data Revolution: Big Data, Open Data, Data Infrastructures & Their Consequences*. Computer Supported Cooperative Work (CSCW), 24(4), 385-388. DOI: <https://doi.org/10.1007/s10606-015-9220-y>

B2 — **Paine, D.**, Woodum, J. M., & Lee, C. P. (2014). *Surveying Scientists About Their Software*. Computer Supported Collaboration Laboratory Technical Reports: University of Washington. DOI: <http://hdl.handle.net/1773/37824>

B1 — **Paine, D.**, Sy, E., Chen, Y-Y., & Lee, C. P. (2014). *Data, Software, and Advanced Computational Usage of University of Washington Research Leaders*. Computer Supported Collaboration Laboratory Technical Reports: University of Washington. DOI: <http://hdl.handle.net/1773/37823>

## Invited Talks and Guest Lectures

I6 — 2017-12-15. Invited Speaker. “*Sociotechnical Investigations of Scientific Software, Collaboration, & Infrastructure*.” Hosted by Frédéric Suter at IN2P3’s Computing Centre (or CC-IN2P3). Lyon, France.

I5 — 2017-12-12. Invited Speaker. “*Sociotechnical Investigations of Scientific Software, Collaboration, & Infrastructure*.” Hosted by Christine Morin & the Myriads Team at Inria Rennes – Bretagne Atlantique. Rennes, France.

I4 — 2017-05-25. Invited Speaker. “*Sociotechnical Investigations of Scientific Software, Collaboration, & Infrastructure*.” Data Science & Technology Department, Lawrence Berkeley National Laboratory.

I3 — 2017-04-13. Invited Speaker. “*Using & Creating Theories When Studying Scientific Collaboration*.” Brook Sattler’s HCDE501 Masters Theory course.

I2 — 2017-04-12. Guest Lecturer. *Interviewing in Qualitative Research*. Charlotte Lee’s HCDE545 PhD Qualitative Methods course.

I1 — 2017-04-04. Discussant. *Cosmology Software & Infrastructure*. Megan Finn’s INF598 Information Infrastructure Studies special topics course.

## Conference Talks (Non-Archival), Workshop Papers, and Posters

C8 — Cheah, Y.-W., **Paine, D.**, Ghoshal, D., & Ramakrishnan, L.. (2018). *Bringing Data Science to Qualitative Analysis*. Paper presented at the 2018 IEEE 14th International Conference on e-Science, Amsterdam, Netherlands. DOI: <https://doi.org/10.1109/eScience.2018.00076>

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C7 — **Paine, D.** (2015). *Unpacking the Production of Radio Astronomy Software and Data Products*. Presentation as part of the Boundaries and Collaboration in Technical and Scientific Work II session at the Society of Social Studies of Science (4S) annual meeting. Denver, CO, Nov. 14, 2015.

C6 — Chen, Y.-Y., **Paine, D.**, & Lee, C. P. (2014). *Generating Data at the Group, Collaborator and Community Levels*. Position paper for the Sharing, Re-use and Circulation of Resources in Cooperative Scientific Work Workshop at the 2014 ACM Conference on Computer Supported Cooperative Work (CSCW).

C5 — **Paine, D.** & Lee, C. P. (2013). *Examining Data-Intensive Science: Data Sources as Coordinative Artifacts*. Presentation as part of the Spatial: II session at the Society of Social Studies of Science (4S) annual meeting. San Diego, CA, Oct. 12, 2013.

C4 — **Paine, D.** & Lee, C. P. (2012). *Sustaining Software Development Projects in Cyberinfrastructure Organizations*. Position paper for the Future of Collaborative Software Development Workshop at the 2012 ACM Conference on Computer Supported Cooperative Work (CSCW).

C3 — **Paine, D.**, Sattler, B., Moberand, K., Turns, J. (2012). *The Implications of Implications*. Poster for HCDE Corporate Affiliates Day. Seattle, WA, Feb. 27, 2012.

C2 — Lee, C. P., Bietz, M. J., Derthick, K. & **Paine, D.** (2011). *Reuse of Data and Technologies across Cyberinfrastructure Development Projects*. Presentation as part of the Collaboration Infrastructures in the Sciences: Sociotechnical Issues panel at the Society of Social Studies of Science (4S) annual meeting. Cleveland, OH, Nov. 3, 2011.

C1 — **Paine, D.** & Ferro, T. (2011). *Cyberinfrastructure Supported Interdisciplinarity*. Presentation as part of the Collaboration Infrastructures in the Sciences: Sociotechnical Issues panel at the Society of Social Studies of Science (4S) annual meeting. Cleveland, OH, Nov. 3, 2011.

## Academic Service

- Big Data & Society Journal, article reviewer
- iConference 2019, paper reviewer
- Ongoing Journal of Computer Supported Cooperative Work (JCSCW), article reviewer
- ACM CHI 2013, 2014, and 2017 Conference, paper reviewer
- ACM CSCW 2015, '2018 Online First' Conference, paper reviewer
- Human Centered Design & Engineering Professorial Hiring Committee member, 2011-2012
- ACM CSCW 2012 Conference, Student Volunteer Day Captain

## Awards, Honor Societies, Certifications

- *Sept 2012 - June 2013* University of Washington College of Engineering Dean's Fellowship
- *Sept 2011 - Mar 2012* Human Centered Design & Engineering Professorial Hiring Committee
- *Oct 2009* inducted to *Indiana Alpha Chapter of Upsilon Pi Epsilon* Computer Science Honor Society
- *Oct 2009* received IEEE Certified Software Development Associate (CSDA) certification

## Professional Affiliations

- Member of the Association for Computing Machinery (ACM)
- Member ACM Special Interest Group on Human Computer Interaction (SIGCHI)
- Member ACM SIGCHI Computer Supported Cooperative Work (CSCW) community