

Curriculum Vitae

Jonathan L. Krein

+1 843-861-3410 (m)
+1 801-642-2355 (w)
JonathanKrein@byu.net

38 Red Pine Dr.
Alpine, UT 84004
<http://faculty.cs.byu.edu/~jkrein>

Education

Doctor of Philosophy (Ph.D.), Computer Science, 2012–2014

Brigham Young University, Provo, Utah, USA

- Dissertation: *Replication and Knowledge Production in Empirical Software Engineering Research*
- Advisor: Charles D. Knutson
- Emphasis: Sociology
- GPA: 4.00/4.00

Master of Science (M.S.), Computer Science, 2009–2011

Brigham Young University, Provo, Utah, USA

- Thesis: *Programming Language Fragmentation and Developer Productivity: An Empirical Study*
- Advisor: Charles D. Knutson
- Emphasis: Statistics
- GPA: 4.00/4.00

Bachelor of Science (B.S.), Computer Science, 2005–2008

Brigham Young University, Provo, Utah, USA

- GPA: 3.99/4.00, Summa cum Laude

Selected Courses: software engineering, advanced topics in data mining, statistics for research, Bayesian methods in computer science, social network analysis, classical social theory, ethnographic research techniques, research in open source systems, research in social media.

Current Positions

President, CEO

Kinpoint, Inc. (kinpoint.com)
Alpine, Utah

September 2008 – Present

One of several founding inventors for the Kinpoint concept and technology. Served as a member of the board of directors since August 2015. Took on the role of President and CEO as of March 2016.

Kinpoint, Inc. began inauspiciously in 2007 as a student project in the BYU Computer Science Department (originally dubbed "The 20-Minute Genealogist"). After a five-year incubation on campus, Kinpoint, Inc., launched as a corporation in early 2013. Kinpoint's corporate mission is to enable the 95% of people who claim to have an interest in family history research and yet spend no time at all actually doing it. Kinpoint is committed to answering the question, "What would software have to do to enable me to be productive doing my own family history research in as little as 20 minutes a week?"

Managing Partner, Testifying Expert**January 2013 – Present**Ironwood Experts, LLC (ironwoodexperts.com)

Alpine, Utah

Helped found the company and initially served as a Consulting Expert. As of July 2014, took on the role of Partner and by January 2015 began serving as a Testifying Expert. Took on the role of Managing Partner as of March 2016.

Ironwood Experts is a consulting firm providing support for software IP litigation (especially patent and trade secret cases). We have served as expert witnesses for some of the world's leading technology companies. We also provide technical support including prior art search, claim charts, source code analysis and technical document review. We have served on cases in district courts, the International Trade Commission, the Federal Trade Commission and USPTO reexaminations.

Adjunct Professor**December 2014 – Present**Dept. of Computer Science (cs.byu.edu)

Brigham Young University, Provo, Utah

Teaching CS 428, Software Engineering. The course teaches students to apply software engineering principles pertaining to product life cycles, requirements, analysis, specification, design, coding, testing, project management, quality assurance, and configuration management.

Past Experience

Co-founder, Managing Partner**July 2015 – April 2016**

Ironwood Quality Experts (Ironwood QX), LLC

Alpine, Utah

Ironwood QX provides software engineering consulting particularly focused on software process and software product quality, as well as custom software testing services.

Instructor**June 2012 – August 2012**Dept. of Computer Science (cs.byu.edu)

Brigham Young University, Provo, Utah

Taught CS 142, Introduction to Programming. The course introduces students to programming fundamentals in the C++ language.

Research Scientist (Intern)**July 2010 – October 2010**Governance Science Research Group, under Clay Williams (www.research.ibm.com/labs/watson)

IBM T. J. Watson Research Center, Hawthorne, New York

Studied software process governance. Interviewed software project stakeholders across IBM to identify coordination and collaboration concerns that threaten large software production environments. As a grounded theory project, the work informed initial hypotheses for process improvement. Further studied the problem of private information—referring to Friedrich Hayek's work, *The Use of Knowledge in Society*, 1945—as well as the potential applicability of principles from *The Wisdom of Crowds* (Surowiecki, 2005) and prediction markets to the management of private information within software production organizations.

Research Assistant/Adjunct Researcher**September 2008 – May 2016**SEQuOIA Lab (sequoia.cs.byu.edu)

Brigham Young University, Provo, Utah

Co-founder/co-organizer of the RESER workshop on replication in empirical software engineering research. Research topics: the philosophy, methods, and challenges of replication in empirical software engineering; the effects of language fragmentation (working concurrently across multiple programming languages) on developer productivity; coordination and collaboration concerns for stakeholders in large software project ecosystems; open source development processes (both in isolation and in comparison to proprietary development).

Software Engineer

April 2007 – August 2008

Office of Information Technology (it.byu.edu)
Brigham Young University, Provo, Utah

Developed technical solutions and software applications to enable internal business processes. Responsibilities included: software developer, project manager, team director, and customer interface for requirements elicitation. Emphasis on integrating business processes across the organization.

Research Assistant

January 2007 – December 2007

Computational Science Lab, under Quinn Snell (csl.cs.byu.edu)
Brigham Young University, Provo, Utah

Bioinformatics research. Worked on the Phylogenetic Search Open-source Data Analysis (PSODA) project. Designed and implemented an interpreted language (PsodaScript) for the specification and execution of phylogenetic search and alignment algorithms. PsodaScript extends the NEXUS format and was designed to be a competitive, open source alternative to PAUP*, the current industry standard. PsodaScript is backwards compatible with PAUP*, but adds advanced language constructs—e.g., looping structures, conditionals, functions, etc. Used Flex/Bison to implement the PsodaScript grammar in C++. Upon execution, the PsodaScript interpreter constructs a call (or object) graph of the program, wherein the graph structure represents the flow logic and the nodes represent the program constructs.

Systems Management Engineer

February 2006 – April 2007

Office of Information Technology (it.byu.edu)
Brigham Young University, Provo, Utah

Maintained the BYU network-monitoring framework. Developed plugins for and installed/maintained enterprise-class network monitoring systems, including ManagedObject, Nagios, and Fruity. Implemented customizations and redesigns for Nagios and Fruity (both open source). Nagios is an industry standard infrastructure-monitoring application; Fruity is an open source, web-based configuration tool for the Nagios system. In particular, added capabilities to Fruity to manage a distributed Nagios implementation. Also developed custom monitoring solutions for various technologies, including the campus emergency phone system, university web applications, and various server platforms.

Academic Service

Co-founder/co-organizer, *IEEE International Workshop on Replication in Empirical Software Engineering Research* (RESER); co-located with *International Conference on Software Engineering* (ICSE 2010, Cape Town, South Africa) and *International Symposium on Empirical Software Engineering and Measurement* (ESEM 2011, Banff, Alberta, Canada; ESEM 2013, Baltimore, Maryland, USA).

Committee Chair Positions

International Workshop on Replication in Empirical Software Engineering Research (RESER), 2010–2013

Reviewer/Program Committee

IEEE Transactions on Software Engineering (TSE), 2012–present
Empirical Software Engineering: An International Journal (EMSE), 2012–present
EMSE Special Issue on Experimental Replications, 2012, 2013

Working Conference on Mining Software Repositories (MSR), Data Track, 2013, 2016

External Reviewer

International Conference on Evaluation and Assessment in Software Engineering (EASE), 2013
IEEE Transactions on Software Engineering (TSE), 2010–2012
International Conference on Open Source Systems (OSS), 2011–2012
Journal of Information and Software Technology (IST), 2011
Psychology of Programming Interest Group Conference (PPIG), 2009–2011

Volunteer Service

Member, Board of Directors

August 2013 – Present

Friday's Kids Respite, non-profit (fridayskids.org)
Orem, Utah

Advise the Friday's Kids board on technology issues. Manage the online presence and technical interests of Friday's Kids, including overseeing development/maintenance of the website (source code, servers, databases, etc.). Integrated the old PHP-based website into a WordPress architecture.

Web Developer (PHP/JavaScript/HTML/MySQL framework)

October 2007 – July 2013

Friday's Kids Respite, non-profit (fridayskids.org)
Orem, Utah

Designed and implemented the Friday's Kids website architecture and business processes; also implemented the layout and content, per the client's design. The website manages volunteer participation and public distribution of information. To facilitate these goals, the system provides user account services, dynamic webpage creation and editing via a graphical interface (for admins), management of volunteer dates and times, automated email communication, and statistical reporting. Frontend implemented in HTML/CSS/JavaScript, with a PHP backend, supported by a MySQL database. MVC architecture.

Full-time Service and Teaching Missionary in Ukraine

October 2002 – November 2004

The Church of Jesus Christ of Latter-day Saints

Publications

(Electronic copies of papers available at <http://faculty.cs.byu.edu/~jkrein/papers/>)

Peer-Reviewed Journals

1. **Jonathan L. Krein**, Lutz Prechelt, Natalia Juristo, Kevin Seppi, Aziz Nanthaamornphong, Jeffrey C. Carver, Sira Vegas, and Charles D. Knutson. A Method for Generalizing across Contexts in Software Engineering Experiments. Under review.
2. **Jonathan L. Krein**, Lutz Prechelt, Natalia Juristo, Aziz Nanthaamornphong, Jeffrey C. Carver, Sira Vegas, Charles D. Knutson, Kevin D. Seppi, and Dennis L. Eggett. A Multi-Site Joint Replication of a Design Patterns Experiment using Moderator Variables to Generalize across Contexts. *IEEE Transactions on Software Engineering*, vol. 42, no. 4, pp. 302–321, 2016.
3. **Jonathan L. Krein**, Alexander C. MacLean, Charles D. Knutson, Daniel P. Delorey, and Dennis L. Eggett. Impact of Programming Language Fragmentation on Developer Productivity: A SourceForge Empirical Study. *International Journal of Open Source Software and Processes*, vol. 2, no. 2, pp. 41–61, 2010.

4. Hyrum D. Carroll, Adam R. Teichert, **Jonathan L. Krein**, Kenneth Sundberg, Quinn O. Snell, and Mark J. Clement. An Open Source Phylogenetic Search and Alignment Package. *International Journal of Bioinformatics Research and Applications*, vol. 5, no. 3, pp. 349–364, 2009.

Peer-Reviewed Conferences

5. (Awarded Best Paper) Brandon Foushee, **Jonathan L. Krein**, Justin Wu, Randy Buck, Charles D. Knutson, Landon J. Pratt, and Alexander C. MacLean. Reflexivity, Raymond, and the Success of Open Source Software Development: A SourceForge Empirical Study. In *Proceedings of the International Conference on Evaluation and Assessment in Software Engineering*, pp. 246–251, Porto de Galinhas, Brazil, 2013.
6. Quinn C. Taylor, **Jonathan L. Krein**, Alexander C. MacLean, and Charles D. Knutson. An Analysis of Author Contribution Patterns in Eclipse Foundation Project Source Code. In *Proceedings of the International Conference on Open Source Systems*, pp. 269–281, Salvador, Brazil, 2011.
7. **Jonathan L. Krein**, Patrick Wagstrom, Stanley M. Sutton Jr., Clay Williams, Charles D. Knutson. The Problem of Private Information in Large Software Organizations. In *Proceedings of the International Conference on Software and Systems Process*, pp. 218–222, Honolulu, Hawaii, USA, 2011.
8. Jason R. Casebolt, **Jonathan L. Krein**, Alexander C. MacLean, Charles D. Knutson, and Daniel P. Delorey. Author Entropy vs. File Size in the GNOME Suite of Applications. In *Proceedings of the International Working Conference on Mining Software Repositories*, pp. 91–94, Vancouver, Canada, 2009.
9. **Jonathan L. Krein**, Adam R. Teichert, Hyrum D. Carroll, Mark J. Clement, and Quinn O. Snell. PsodaScript: Applying Advanced Language Constructs to Open-source Phylogenetic Search. In *Proceedings of the Biotechnology and Bioinformatics Symposium*, pp. 89–94, Boulder, Colorado, USA, 2007.

Peer-Reviewed Workshops

10. Kyle L. Blatter, T.J. Gedhill, **Jonathan L. Krein**, and Charles D. Knutson. Impact of Communication Structure on System Design: Towards a Controlled Test of Conway's Law. In *Proceedings of the International Workshop on Replication in Empirical Software Engineering Research*, pp. 25–33, Baltimore, Maryland, USA, 2013.
11. Sabrina E. Bailey, Sneha S. Godbole, Charles D. Knutson, and **Jonathan L. Krein**. A Decade of Conway's Law: A Literature Review from 2003–2012. In *Proceedings of the International Workshop on Replication in Empirical Software Engineering Research*, pp. 1–14, Baltimore, Maryland, USA, 2013.
12. **Jonathan L. Krein**, Landon J. Pratt, Alan B. Swenson, Alexander C. MacLean, Charles D. Knutson, and Dennis L. Eggett. Design Patterns in Software Maintenance: An Experiment Replication at Brigham Young University. In *Proceedings of the International Workshop on Replication in Empirical Software Engineering Research*, pp. 25–34, Banff, Alberta, Canada, 2011.
13. Scott H. Burton, Paul M. Bodily, Richard G. Morris, Charles D. Knutson, and **Jonathan L. Krein**. Design Team Perception of Development Team Composition: Implications for Conway's Law. In *Proceedings of the International Workshop on Replication in Empirical Software Engineering Research*, pp. 52–60, Banff, Alberta, Canada, 2011.
14. **Jonathan L. Krein** and Charles D. Knutson. A Case for Replication: Synthesizing Research Methodologies in Software Engineering. In *Proceedings of the International Workshop on Replication in Empirical Software Engineering Research*, Cape Town, South Africa, 2010.
15. Alexander C. MacLean, Landon J. Pratt, **Jonathan L. Krein**, and Charles D. Knutson. Threats to Validity in Analysis of Language Fragmentation on SourceForge Data. In *Proceedings of the International Workshop on Replication in Empirical Software Engineering Research*, Cape Town, South Africa, 2010.

16. Alexander C. MacLean, Landon J. Pratt, **Jonathan L. Krein**, and Charles D. Knutson. Trends that Affect Temporal Analysis Using SourceForge Data. In *Proceedings of the International Workshop on Public Data about Software Development*, South Bend, Indiana, USA, 2010.
17. **Jonathan L. Krein**, Alexander C. MacLean, Daniel P. Delorey, Charles D. Knutson, and Dennis L. Eggett. Language Entropy: A Metric for Characterization of Author Programming Language Distribution. In *Proceedings of the International Workshop on Public Data about Software Development*, Skovde, Sweden, 2009.
18. Charles D. Knutson and **Jonathan L. Krein**. The 20-Minute Genealogist: A Context-Preservation Metaphor for Assisted Family History Research. In *Proceedings of the Workshop on Technology for Family History and Genealogical Research*, Provo, Utah, USA, 2009.

Thesis and Dissertation

19. **Jonathan L. Krein**, *Replication and Knowledge Production in Empirical Software Engineering Research*. Doctoral Dissertation, Brigham Young University, 2014.
20. **Jonathan L. Krein**. *Programming Language Fragmentation and Developer Productivity: An Empirical Study*. Master's Thesis, Brigham Young University, 2011.

Trade Journals

21. **Jonathan L. Krein**. RAM Nagios vs. HD Nagios: Performance Evaluation. *Sys Admin, the journal for UNIX and Linux systems administrators*, vol. 16, no. 3, pp. 32–34, 2007.
22. **Jonathan L. Krein**. Nagios and Fruity: What is Their Monitoring Potential for Your Network? *Sys Admin, the journal for UNIX and Linux systems administrators*, vol. 16, no. 1, pp. 12–16, 2007.

Patents

23. United States Patent No. 8,452,805. Charles D. Knutson, **Jonathan L. Krein**, Daniel Zappala, and Daniel P. Delorey. *Genealogy Context Preservation*. Issued: May 28, 2013.

Other Publications

24. **Jonathan L. Krein**, Charles D. Knutson, and Christian Bird. Report from the 3rd International Workshop on Replication in Empirical Software Engineering Research (RESER 2013). *SIGSOFT Software Engineering Notes*, vol. 39, no. 1, pp. 31–35, 2014.
25. **Jonathan L. Krein**, Charles D. Knutson, Lutz Prechelt, and Christian Bird. Message from the RESER 2013 Workshop Chairs. In *Proceedings of the International Symposium on Empirical Software Engineering and Measurement*, p. 395, Baltimore, Maryland, USA, 2013.
26. **Jonathan L. Krein**, Charles D. Knutson, Lutz Prechelt, and Natalia Juristo. Report from the 2nd International Workshop on Replication in Empirical Software Engineering Research (RESER 2011). *SIGSOFT Software Engineering Notes*, vol. 37, no. 1, pp. 27–30, 2012.
27. Charles D. Knutson, **Jonathan L. Krein**, Lutz Prechelt, and Natalia Juristo. Report from the 1st International Workshop on Replication in Empirical Software Engineering Research (RESER 2010). *SIGSOFT Software Engineering Notes*, vol. 35, no. 5, pp. 42–44, 2010.
28. Charles D. Knutson, **Jonathan L. Krein**, Lutz Prechelt, and Natalia Juristo. 1st International Workshop on Replication in Empirical Software Engineering Research (RESER). In *Proceedings of the International Conference on Software Engineering*, pp. 461–462, Cape Town, South Africa, 2010.

29. Charles D. Knutson and **Jonathan L. Krein**. The 20-Minute Genealogist: Validating a Research Metaphor. Poster in *BYU Studies 50th Anniversary Symposium*, Provo, Utah, USA, 2010.

Honors and Awards

- Recipient:
 - Graduate Research Fellowship Award, Brigham Young University, 2010
 - Karl G. Maeser Scholarship, full tuition and books, Brigham Young University, 2007
 - Brigham Young Scholarship, full tuition, Brigham Young University, 2005–2006, 2008
 - Palmetto Fellows Scholarship, full tuition, Clemson University, 2001–2002
- Graduated Summa cum Laude, B.S. in Computer Science, Brigham Young University, 2008
- Dean's List all years, Clemson University and Brigham Young University
- Honor Society of Phi Kappa Phi, Brigham Young University chapter, invited

Memberships

- Institute of Electrical and Electronics Engineers (IEEE)
- Association for Computing Machinery (ACM)

Miscellaneous

- **Citizenship:** United States of America.
- **Spoken languages:** Native English, Russian (lived two years in Ukraine, 2002–2004).
- **Programming languages, frameworks, tools, etc.:** Java, C/C++, PHP, Python, JavaScript, R, LaTeX, MySQL, Unix, Linux, Mac OS X, Windows, SAS, Perl, C#, Maven, Make, Oracle, Flex/Bison, Hibernate, Tapestry, JSP, JSF, Objective-C, Ruby, Scheme, JBoss.
- **Statistical methods/tools:** Linear mixed models, Bayesian analysis, SAS, R.
- **Empirical research methods:** Grounded theory, ethnographic interviewing, human subjects research, protocol design, IRB process, subject recruitment, study execution, data cleaning/analysis, etc.
- **Other methods:** Social network analysis, data mining, open source software research.