

# Curriculum Vitae

## Charles D. Knutson

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## Education

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**Doctor of Philosophy (Ph.D.), Computer Science**, January 1998  
Oregon State University, Corvallis, Oregon, USA

- Dissertation: *Pattern Systems and Methodologies for Multiparadigm Analysis and Design*
- Advisors: Curtis R. Cook, Timothy A. Budd

**Master of Science (M.S.), Computer Science**, August 1994  
Brigham Young University, Provo, Utah, USA

- Dissertation: *TalkLib: An Object-Oriented Mechanism for Distributed Communication*
- Advisors: Scott N. Woodfield, Evan L. Ivie

**Bachelor of Science (B.S.), Computer Science**, 1988  
Brigham Young University, Provo, Utah, USA

University of Iowa, Sep. 1982 – Dec. 1984

## Professional Experience

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**Founder, Chairman** (February 2013 – Present)  
*Kinpoint, Inc.*, Provo, Utah

[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?”

**Founder, Partner** (January 2013 – Present)  
*Ironwood Experts, LLC*, Salem, Utah

[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. Ironwood Experts also provides software engineering consulting particularly focused on software process and software product quality. Ironwood also provides custom software testing services.

**Founder, Chairman, Podcast Host** (October 2007 – Present)  
*The Internet Safety Project*, Provo, Utah

[The Internet Safety Project](#) is a non-profit corporation dedicated to helping individuals navigate the intersections between technology and life. The Internet Safety Podcast is a popular audio program dealing with issues of Internet Safety across a broad range of topics. The Internet Safety Wiki is a collaborative information resource hosting thousands of articles focused on the full range of Internet Safety issues, providing a “one stop shop” for individuals concerned about issues of safety online.

**Associate Professor** (September 2006 – December 2014)  
*Brigham Young University, Computer Science Department*, Provo, Utah

Director, SEQuOIA (“Software Engineering Quality: Observation, Insight, Analysis”) Laboratory. Research interests in Software Engineering, Software Process, Software Quality, Software Management. Director, BYU Mobile Computing Laboratory, Wireless Data Communication (2000-2008).

**Assistant Professor** (July 2000 – August 2006)

*Brigham Young University, Computer Science Department, Provo, Utah*

Director, BYU Mobile Computing Laboratory. Research interests in Wireless Data Communications, Embedded Systems, Networking, Software Engineering, Software Quality, Software Management, Software Patterns, Multiparadigm Design.

**Senior Instructor** (September 1999 – June 2000)

*Oregon State University, Computer Science Department, Corvallis, Oregon*

Member of Software Engineering faculty. Responsibilities for developing and teaching graduate courses in Oregon Master of Software Engineering (OMSE) Program.

**Vice President, Research and Development** (October 1996 – August 1999)

*Counterpoint Systems Foundry, Inc., Corvallis, Oregon*

Guided and managed development of system and application software for infrared and Bluetooth data communications. Counterpoint was an early member and technical leader of the Infrared Data Association (IrDA), international industry consortium for infrared data communication. Counterpoint became a wholly-owned subsidiary of Extended Systems, Inc. in April 1997.

**Software Quality Consultant** (September 1994 – October 1996)

*ComSoft Consulting, Corvallis, Oregon*

Provided software consulting services including project management, analysis, design, development, testing, and documentation. Development in C, C++ and Assembly. Clients included Novell, Inc. and Intel Corporation.

**Development Engineer/Technical Lead** (August 1991 – September 1994)

*Novell, Inc., NetWare Products Division, Provo, Utah*

Developed Storage Management Services (SMS) Target Service Agent (TSA) for OS/2. Developed automated tools for advanced distributed testing. Development in C on DOS, OS/2 and NetWare.

**System Test Manager, Client Software** (April 1990 – August 1991)

*Novell, Inc., NetWare Products Division, Provo, Utah*

Managed seven System Test teams, including OS/2 Requester, Windows NetWare Drivers, DOS NetWare Shells, Communication Protocols, NetWare Lite, IBM Interoperability and OS/2 File Server. Managed 16 engineers.

**Columnist** (February 1990 – August 1990)

*LAN Times, McGraw-Hill, Midvale, Utah*

Monthly column on NetWare OS/2 Requester.

**Contributing Editor** (February 1990 – August 1990)

*NetWare Technical Journal, McGraw-Hill, Midvale, Utah*

Contributed articles, editing, and consultation.

**Development Engineer** (April 1988 – March 1989)

*Hewlett-Packard, Personal Computer Group, Sunnyvale, California*

OS/2 development team for the HP Vectra line of personal computers, assisting in adapting Microsoft OS/2 to Vectra platforms. Development in MASM and C.

**Instructor** (September 1988 – March 1989)

*Disabled Programmers, Inc., San Jose, California*

Developed and taught courses on UNIX Operating System, UNIX Shell Programming, C Programming Language, Relational Databases (emphasis on DB2), and Software Engineering.

**Instructor** (July 1988 – March 1989)

*National University, San Jose, California*

Developed and taught courses on Operating Systems (emphasis on Unix) and Comparative Programming Languages (emphasis on C, LISP, Forth).

**Instructor** (September 1987 – April 1988)

*Waterford Upper School, Provo, Utah*

Taught beginning and intermediate programming with Pascal.

**Programmer/Technical Writer** (April 1987 – January 1988)

*Signetics Corporation, Provo, Utah*

Maintained and documented interactive TTL circuit design package on Lillith personal computer. Programming in Modula II.

**Instructor** (July 1987 – August 1987)

Brigham Young University, Computer Science Department, Provo, Utah

Taught Introduction to Computer Architecture and Assembly Language Programming (emphasis on Motorola 6502 architecture).

**Director, Technical Development** (April 1986 – February 1987)

Innovative Courseware Design Corporation, Provo, Utah

Designed and supervised development of interactive educational software for IBM PC compatibles (VersaText and VersaText Authoring System).

## Publications

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### Academic Conference Publications

1. Sabrina Bailey, Sneha Godbole, Charles D. Knutson and Jonathan L. Krein. "A Decade of Conway's Law: A Literature Review." *Proceedings of the 3rd International Workshop on Replication in Empirical Software Engineering Research (RESER 2013)*, Baltimore, Maryland, October 9, 2013.
2. Kyle Blatter, T.J. Gledhill, Jonathan L. Krein and Charles D. Knutson. "Impact of Communication Structure on System Design: Towards a Controlled Test of Conway's Law." *Proceedings of the 3rd International Workshop on Replication in Empirical Software Engineering Research (RESER 2013)*, Baltimore, Maryland, October 9, 2013.
3. Alexander C. MacLean and Charles D. Knutson. "Apache Commits: Social Network Dataset." *Proceedings of the 10th Working Conference on Mining Software Repositories (MSR 2013)*, San Francisco, California, May 18-19, 2013.
4. 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." *Proceedings of the 17th International Conference on Evaluation and Assessment in Software Engineering (EASE 2013)*, Porto de Galinhas, Brazil, April 14-16, 2013.
5. Charles D. Knutson. "Motivational Interfaces, or, Everything I Need to Know about Family Trees I Learned from Angry Birds." *Proceedings of the 13th Annual Workshop on Technology for Family History and Genealogical Research*, Salt Lake City, Utah, March 21-23, 2013.
6. Charles D. Knutson and Daniel Zappala. "The Twenty Minute Genealogist: Assisting Family History Research through Navigation and Context Preservation." *Proceedings of the 12th Annual Workshop on Technology for Family History and Genealogical Research*, Salt Lake City, Utah, February 3, 2012.
7. Alexander C. MacLean, Landon J. Pratt, and Charles D. Knutson. "Knowledge Homogeneity and Specialization in the Apache HTTP Server Project." *Proceedings of the 7th International Conference on Open Source Systems (OSS 2011)*, Salvador, Brazil, October 6-7, 2011.
8. Alexander C. MacLean and Charles D. Knutson. "Open Source: From Mythos to Meaning." *Proceedings of the 7th International Conference on Open Source Systems (OSS 2011) Doctoral Consortium*, Salvador, Brazil, October 6-7, 2011.
9. Landon J. Pratt, Alexander C. MacLean, and Charles D. Knutson. "Cliff Walls: An Analysis of Monolithic Commits Using Latent Dirichlet Allocation." *Proceedings of the 7th International Conference on Open Source Systems (OSS 2011)*, Salvador, Brazil, October 6-7, 2011.
10. 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." *Proceedings of the 7th International Conference on Open Source Systems (OSS 2011)*, Salvador, Brazil, October 6-7, 2011.
11. 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." *Proceedings of the 2nd International Workshop on Replication in Empirical Software Engineering Research (RESER 2011)*, Banff, Alberta, Canada, September 21, 2011.
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." *Proceedings of the 2nd International Workshop on Replication in Empirical Software Engineering Research (RESER 2011)*, Banff, Alberta, Canada, September 21, 2011.

13. Jonathan L. Krein, Patrick Wagstrom, Stanley M. Sutton Jr., Clay Williams, and Charles D. Knutson. "The Problem of Private Information in Large Software Organizations." *Proceedings of the International Conference on Software and Systems Process (ICSSP 2011)*, Honolulu, Hawaii, May 22, 2011.
14. Alexander C. MacLean, Landon J. Pratt, Jonathan L. Krein and Charles D. Knutson. "Trends That Affect Temporal Analysis Using SourceForge Data." *Proceedings of the Fifth International Workshop on Public Data about Software Development (WoPdaSD '10)*, Notre Dame, Indiana, June 2, 2010.
15. Charles D. Knutson, Jonathan L. Krein, Lutz Prechelt and Natalia Juristo. "1st International Workshop on Replication in Empirical Software Engineering Research (RESER)." *Proceedings of the 32nd ACM/IEEE International Conference on Software Engineering (ICSE '10)*, Cape Town, South Africa, May 4, 2010.
16. Jonathan L. Krein and Charles D. Knutson. "A Case for Replication: Synthesizing Research Methodologies in Software Engineering." *Proceedings of the First International Workshop on Replication in Empirical Software Engineering Research (RESER '10)*, Capetown, South Africa, May 4, 2010.
17. Alexander C. MacLean, Landon J. Pratt, Jonathan L. Krein and Charles D. Knutson. "Threats to Validity in Analysis of Language Fragmentation on SourceForge Data." *Proceedings of the First International Workshop on Replication in Empirical Software Engineering Research (RESER '10)*, Capetown, South Africa, May 4, 2010.
18. Daniel P. Delorey, Charles D. Knutson, and Mark Davies. "Mining Programming Language Vocabularies from Source Code." *Proceedings of the Psychology of Programming Interest Group Conference (PPIG 2009)*, Limerick, Ireland, June 24, 2009.
19. 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." *Proceedings of the Fourth Workshop on Public Data about Software Development (WoPdaSD 2009)*, Skovde, Sweden, June 6, 2009.
20. Jason Casebolt, Jonathan L. Krein, Alexander C. MacLean, Daniel P. Delorey, Charles D. Knutson. Challenge Paper: "Author Entropy vs. File Size in the GNOME Suite of Applications." *Proceedings of the 6<sup>th</sup> IEEE International Working Conference on Mining Software Repositories (MSR 09)*, Vancouver, British Columbia, Canada, May 23, 2009.
21. Charles D. Knutson and Jonathan Krein. "The 20-Minute Genealogist: A Context-Preservation Metaphor for Assisted Family History Research." *Proceedings of the 9th Annual Workshop on Technology for Family History and Genealogical Research*, Provo, Utah, March 12, 2009.
22. Qiuyi Duan, Lei Wang, Charles D. Knutson and Daniel Zappalla. "Autonomous and Intelligent Radio Switching for Heterogeneous Wireless Networks." *Proceedings of the Fourth IEEE International Workshop on Heterogeneous Multi-Hop Wireless and Mobile Networks 2008 (IEEE MHWMN'08)*, Atlanta, Georgia, September 29, 2008.
23. Quinn Taylor, James Stevenson, Daniel P. Delorey, and Charles D. Knutson. "Author Entropy: A Metric for Characterization of Software Authorship Patterns." *Proceedings of the Third Workshop on Public Data about Software Development (WoPdaSD 2008)*, Milan, Italy, September 10, 2008.
24. Qiuyi Duan, Lei Wang, Charles D. Knutson and Daniel Zappala. "Link Quality Prediction for Wireless Devices with Multiple Radios." *Proceedings of the Ninth IEEE International Symposium on a World of Wireless Mobile and Multimedia Networks (WoWMoM)*, Newport Beach, California, June 23-27, 2008.
25. Daniel P. Delorey, Charles D. Knutson, and Christophe Giraud-Carrier. "Programming Language Trends in Open Source Development: An Evaluation Using Data from All Production Phase SourceForge Projects." *Proceedings of the Second Workshop on Public Data about Software Development (WoPdaSD 2007)*, Limerick, Ireland, June 14, 2007.
26. Daniel P. Delorey, Charles D. Knutson, and Alex MacLean. "Studying Production Phase SourceForge Projects." *Proceedings of the Second Workshop on Public Data about Software Development (WoPdaSD 2007)*, Limerick, Ireland, June 14, 2007.
27. Daniel P. Delorey, Scott Chun, and Charles D. Knutson. "Do Programming Languages Affect Productivity? A Case Study Using Data from Open Source Projects." *Proceedings of the First International Workshop on Emerging Trends in FLOSS Research and Development (FLOSS 2007)*, Minneapolis, Minnesota, May 21, 2007.
28. Manoj Pandey, Daniel P. Delorey, Qiuyi Duan, Lei Wang, Charles D. Knutson, Daniel Zappala, Ryan Woodings. "RIA: An RF Interference Avoidance Algorithm for Heterogeneous Wireless Networks." *Proceedings of the IEEE Wireless Communication and Networking Conference (WCNC 2007)*, Hong Kong, March 11-15, 2007.
29. Qiuyi Duan, Lei Wang, Charles D. Knutson, and Michael A. Goodrich. "Axiomatic Multi-Transport Bargaining: A Quantitative Method for Dynamic Transport Selection in Heterogeneous Multi-Transport Wireless Environments." *Proceedings of the IEEE Wireless Communication and Networking Conference (WCNC 2006)*, Las Vegas, Nevada, April 3-6, 2006.

30. Timothy W. van der Horst, Tore Sundelin, Kent E. Seamons, and Charles D. Knutson. "Mobile Trust Negotiation: Authentication and Authorization in Dynamic Mobile Networks." *Proceedings of the Eighth IFIP TC-6 TC-11 Conference on Communications and Multimedia Security (CMS 2004)*, Cumbria, England, September 15-18, 2004.
31. Seth J. Nielson and Charles D. Knutson. "OO++: Exploring the Multiparadigm Shift." *Proceedings of the Workshop on Multiparadigm Programming with Object-Oriented Languages (MPOOL 2004)*, Oslo, Norway, June 15, 2004.
32. Charles D. Knutson, Ryan W. Woodings, Shannon B. Barnes, Heidi R. Duffin, and Jeffrey M. Brown. "Dynamic Autonomous Transport Selection in Heterogeneous Wireless Environments." *Proceedings of the IEEE Wireless Communication and Networking Conference (WCNC 2004)*, Atlanta, Georgia, March 21-25, 2004.
33. Heidi R. Duffin, Charles D. Knutson, and Michael A. Goodrich. "Prioritized Soft Constraint Satisfaction: A Qualitative Method for Dynamic Transport Selection in Heterogeneous Wireless Environments." *Proceedings of the IEEE Wireless Communication and Networking Conference (WCNC 2004)*, Atlanta, Georgia, March 21-25, 2004.
34. Casey T. Deccio, Joseph Ekstrom, D. Ryan Partridge, Kevin B. Tew, and Charles D. Knutson. "A Study of the Suitability of IrOBEX for High-Speed Exchange of Large Data Objects." *Proceedings of the IEEE Global Communications Conference 2003 (GLOBECOM 2003)*, San Francisco, California, December 1-5, 2003.
35. David K. Vawdrey, Tore L. Sundelin, Kent E. Seamons, and Charles D. Knutson. "Trust Negotiation for Authentication and Authorization in Healthcare Information Systems." *Proceedings of the 25<sup>th</sup> Annual International Conference of the IEEE Engineering in Medicine and Biology Society*, Cancun, Mexico, September 17-21, 2003.
36. David K. Vawdrey, Eric S. Hall, and Charles D. Knutson. "A Self-Adapting Healthcare Information Infrastructure Using Mobile Computing Devices." *Proceedings of the 5<sup>th</sup> IEEE International Workshop in Enterprise Networking and Computing in Healthcare Industry (HealthCom 2003)*, Santa Monica, California, June 6-7, 2003.
37. Shannon B. Barnes, Ryan W. Woodings, and Charles D. Knutson. "Transport Discovery in Wireless Multi-Transport Environments." *Proceedings of the IEEE Wireless Communications and Networking Conference 2003 (WCNC 2003)*, New Orleans, Louisiana, March 17-19, 2003.
38. James C. Funk, Heidi R. Duffin, Lichen Dai, and Charles D. Knutson. "Inverse Multiplexing in Short-Range Multi-Transport Wireless Communications." *Proceedings of the IEEE Wireless Communications and Networking Conference 2003 (WCNC 2003)*, New Orleans, Louisiana, March 17-19, 2003.
39. Eric S. Hall, David K. Vawdrey, and Charles D. Knutson. "RF Rendez-Blue: Easing the Bluetooth Power and Delay Burdens in Mobile Systems." *Proceedings of the Eleventh IEEE International Conference on Computer Communications and Networks (IC3N '02)*, Miami, Florida, October 14-16, 2002.
40. James Funk and Charles D. Knutson. "Evaluating the Capacity of RLL Encoding for High Bandwidth Infrared Channels." *Proceedings of the 3rd International Symposium on Communication Systems, Networks and Digital Signal Processing (CSNDSP '02)*, Stafford, England, July 15-17, 2002.
41. Ryan Woodings, Derek Joos, Trevor Clifton, and Charles D. Knutson. "Rapid Heterogeneous Ad Hoc Connection Establishment: Accelerating Bluetooth Inquiry Using IrDA." *Proceedings of the Third Annual IEEE Wireless Communications and Networking Conference (WCNC '02)*, Orlando, Florida, March 18-21, 2002.
42. Michael G. Robertson, Scott V. Hansen, Franklin E. Sorenson, and Charles D. Knutson. "Modeling IrDA Performance: The Effect of IrLAP Negotiation Parameters on Throughput." *Proceedings of the Tenth IEEE International Conference on Computer Communications and Networks (ICCCN '01)*, Phoenix, Arizona, October 15-17, 2001.
43. Bradley J. Baird, Mark Clement, Charles D. Knutson, and Quinn Snell. "The Impact of Hardware Characteristics on Firewall Performance." *Proceedings of the 2001 International Symposium on Performance Evaluation of Computer and Telecommunication Systems*, Orlando, Florida, July 15-19, 2001.
44. Stephane Chatre, Charles D. Knutson, Dragos Margineantu, and Carsten Schulz-Key. "Improving DLX Performance by Taking Some of the Reduction out of RISC." *Proceedings of the Conference on Technical Informatics*, Timisoara, Romania, November 14-16, 1996.
45. Charles D. Knutson. "Where did the System Test Department Go? (Or Through the Hourglass and What Novell Found There)." *Proceedings of the Fourteenth Annual Pacific Northwest Software Quality Conference (PNSQC '96)*, Portland, Oregon, October 28-30, 1996.
46. Charles D. Knutson, Timothy A. Budd, and Curtis R. Cook. "Multiparadigm Patterns of Thought and Design." *Proceedings of the Third Annual Conference on the Pattern Languages of Programs (PLOP3)*, Monticello, Illinois, September 4-6, 1996.
47. Charles D. Knutson. "Software Testing in a Network Environment." *Proceedings of the International Conference on Achieving Quality in Software (AQUIS '91)*, Pisa, Italy, April 22-24, 1991.



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