

Patrick Adam Wagstrom

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Research/Technical Skills

Programming: Java, R, Groovy, Python, JavaScript, Unix Shell Scripting.

Research Methods: Social Network Analysis, Data Mining, Text and Content Analysis, Qualitative Data Analysis, Hierarchical Linear Modeling, Uncertainty Modeling and Simulation, Multi-Attribute Utility Analysis, Graph-based NoSQL Databases, Usability Analysis.

Data Mining: Mining Software Engineering Repositories, Collecting and Linking Unstructured Communications (Forums, Twitter, etc), Scraping Vendor Provided APIs, Hadoop Analysis, Free-Text Sentiment Analysis.

Primary Research Interests

Socio-technical collaboration networks in software engineering

Information contagion in distributed software engineering teams

Large-scale software engineering repositories and social networks as accessible "big data"

Randomness and uncertainty in software engineering processes

Technology policy and open source software development

Education

Ph.D. in Engineering and Public Policy and Computation, Organizations, and Society, May 2009

Carnegie Mellon University, Pittsburgh, PA

Dual degree between the Carnegie Institute of Technology (College of Engineering) and School of Computer Science at Carnegie Mellon University. Ph.D. thesis title "Vertical Interaction in Open Software Engineering Communities". Thesis advisors Dr. James Herbsleb and Dr. Kathleen Carley.

MS in Computation, Organizations, and Society, May 2007

Carnegie Mellon University, Pittsburgh, PA

MS in Computer Science, August 2003

Illinois Institute of Technology, Chicago, IL

Member of the Scalable Computer Systems Laboratory under the supervision of Dr. Xian-He Sun. Developed "Scarlet" a framework of pervasive computing environments built on top of web services frameworks and standards.

BS in Computer Science, May 2002

Illinois Institute of Technology, Chicago, IL

BS in Computer Engineering, May 2002

Illinois Institute of Technology, Chicago, IL

BS in Electrical Engineering, May 2002

Illinois Institute of Technology, Chicago, IL

Work Experience

Research Staff Member

IBM TJ Watson Research Center, Yorktown Heights, NY

August 2009–Present

Achievements:

- Developed a robust framework for collecting and analyzing massive amounts of software engineering archival data in a distributed graph database running on a Hadoop cluster
- Led a team to evaluate productivity of new users and small teams using enterprise software engineering tools
- Worked with IBM clients to teach about uncertainty and value elicitation in software development
- Mapped extended stakeholders in enterprise software development and analyzed their relation to technical debt
- Developed novel methods and metrics for understanding extended enterprise software development stakeholder collaboration and coordination

- Managed research on interactions around software development with three different universities through an Open Collaborative Research grant
- Mentored three Ph.D. level student interns on projects related to collaboration in software engineering
- Developed a framework for assessing an individuals personal brand by analyzing connections and contents of their actions through public social networks

Graduate Research Assistant

Carnegie Mellon University, Pittsburgh, PA

August 2003–July 2009

Achievements:

- Explored the complex interactions and motivations involved in Open Source Software development
- Delivered lectures in classes on software engineering and technology policy
- Utilized a variety of qualitative and quantitative research methods: stakeholder interviews, message analysis, natural language processing, data mining, and social network analysis - among others
- Developed a large scale framework for collecting and analyzing socio-technical information surrounding Open Source Software development

Summer Research Intern

IBM TJ Watson Research Center, Hawthorne, NY

June 2007–August 2007

Achievements:

- Expanded the Socio-Technical Congruence metric for enterprise use
- Integrated individualized factors into the Socio-Technical Congruence metric
- Developed a model of successful projects that transitioned from IBM proprietary to Open Source
- Developed novel visualizations of communication congruence in software development teams

Teaching Assistant

Computer Science Department, Illinois Institute of Technology, Chicago, IL

September 2000–August 2003

Achievements:

- Designed and graded homework assignments and tests
- Delivered numerous lectures on a wide variety of related to distributed computer, operating systems, and computer architecture
- Oversaw and helped to design and develop student projects
- Managed a group of twelve undergraduates on an ambitious project around pervasive computing on a college campus

Summer Research Intern

Math and Computer Science Division, Argonne National Laboratory, Argonne, IL

April 2002–September 2002

Achievements:

- Developed the Grid Services Flow Language for specifying dependencies and flow in the GLOBUS Environment.
- Worked with the SciDAC Java CoG Kit Team and the Collaboratory for Multiscale Chemistry to develop a grid services based system for analysis of thermochemical tables.

Senior Developer

LEC, Ltd, Chicago, IL

April 1999–September 2000

Achievements:

- Worked directly with designers and clients to sell and develop usable, novel, and cutting edge web experiences.
- Designed, ordered, installed, and managed a commercial grade data center for advertising agency clients.
- Architected and developed E-Stakes, a multi-million user capable system for tying offline purchases to online activities.
- Designed and managed the technical components of the Chicago Transit Authority's "Take it and Win" promotion that utilized CTA transit cards and a web site to provide prizes to transit riders.

Developer

*MyPoints, Schaumburg, IL
April 1998–September 1998*

Achievements:

- One of the earliest employees of an innovative marketing company
- Designed and implements a complete customer service system in PL/SQL and Java
- Integrated customer service system to work with multiple advertising campaigns

Teaching Experience**Intern Mentor**

*IBM Research
November 2009–Present*

Mentored three interns over three years for 12-16 weeks each. Helped interns to understand our current research trajectory, plan out a research project, provision resources necessary to conduct studies, and product a solid research product.

Project Manager for Student Project on the Impact of Spyware

*Carnegie Mellon University
2005*

Worked with two other graduate students under Dr. Jon Peha and Dr. Ed Rubin to manage and guide senior level project to understand the nature of spyware and its effect on consumers. Culminated in a large project report and presentation to a review board with individuals from Carnegie Mellon, the Federal Trade Commission, and AOL.

Research Supervisor for Undergraduate Summer Researchers

*Illinois Institute of Technology
2003*

Hired, guided, and advised three undergraduate researchers on developing innovative applications and frameworks for pervasive computing.

Instructor/Project Lead for Interprofessional Project

*Illinois Institute of Technology
2003*

Under the guidance of Dr. Xian-He Sun I worked and managed twelve undergraduates to design and implement applications of pervasive computing as part of the IPRO program at IIT. The initial project was an in-class tool that provided rapid responses from surveys and quizzes. Later expansion and refocus of the project led to a pervasive tour system for the city of Chicago.

Teaching Assistant for CS595 - Special Topics in Computer Science

*Illinois Institute of Technology
2003*

Worked with Dr. Xian-He Sun and Dr. Gregor von Laszewski to create a class addressing the nexus of pervasive and grid computing. Responsible for co-design of course syllabus, developing student homework, grading assignments, and helping to plan out lectures and course material.

Teaching Assistant for CS450 - Operating Systems

*Illinois Institute of Technology
2002–2003*

Assisted students, managed lab sessions, graded student homework assignments, and guest lectured in senior level required course on operating systems. I was awarded the Teaching Assistant of the Year for the Department of Computer Science at Illinois Institute of Technology for this.

Teaching Assistant for CS470 - Computer Architecture

*Illinois Institute of Technology
2000–2002*

Graded student homework assignments, managed lab sessions, and guest lectured in senior level required computer architecture course under Virgil Bistriceanu.

Journal Papers

Patrick Wagstrom, James Herbsleb. "Dependency Forecasting in the Distributed Agile Organization". *Communications of the ACM*. October 2006.

Gregor von Laszewski, Branko Ruscic, Kaizar Amin, Patrick Wagstrom, Sriram Krishnan, Sandeep Nijsure. "A Framework for Building Scientific Knowledge Grids Applied to Thermochemical Tables". *The International Journal of High Performance Computing Applications*. Winter 2003.

Conference Papers

Patrick Wagstrom, Corey Jergensen, Anita Sarma. "A Network of Rails: A Graph DataSet of Ruby on Rails and Associated Projects". *Proceedings of the 2013 Working Conference on Mining Software Repositories*. San Francisco, CA. May 2013.

Corey Jergensen, Anita Sarma, Patrick Wagstrom. "The Onion Patch: Migration in Open Source Ecosystems". *ESEC-FSE 2011*. Szeged, Hungary. September 2011.

Jonathan Krein, Patrick Wagstrom, Stanley M. Sutton, Clay Williams, Charles Knutson. "The Problem of Private Information in Large Software Organizations". *ICSSP 2011*. Honolulu, HI. May 2011.

Laura Dabbish, Patrick Wagstrom, Anita Sarma, James Herbsleb. "Coordination in Innovative Design and Engineering: Observations from a Lunar Robotics Project". *GROUP 2010*. Sanibel Island, FL. November 2010.

Patrick Wagstrom, James Herbsleb, Kathleen Carley. "Communication, Team Performance, and the Individual: Bridging Technical Dependencies". *2010 Academy of Management Annual Meeting*. Montreal, Canada. August 2010.

Patrick Wagstrom, James Herbsleb, Robert Kraut, Audris Mockus. "The Impact of Commercial Organization on Volunteer Participation in an Online Community". *2010 Academy of Management Annual Meeting*. Montreal, Canada. August 2010.

Laura Dabbish, Patrick Wagstrom, Anita Sarma. "Cross-Team Knowledge Exchange in an Interdisciplinary Engineering Project". *2010 Academy of Management Annual Meeting*. Montreal, Canada. August 2010.

James Herbsleb, Laura Dabbish, Patrick Wagstrom, Anita Sarma. "Supporting Coordination of Interdependent Work: A Constraint Network Representation of Dependencies in Design and Engineering Teams". *2009 Academy of Management Annual Meeting*. Chicago, IL. August 2009.

Anita Sarma, Larry Maccherone, Patrick Wagstrom, James Herbsleb. "Tesseract: Interactive Visual Exploration of Socio-Technical Relationships in Software Development". *2009 International Conference on Software Engineering*. Vancouver, BC, Canada. May 2009.

Marcelo Cataldo, Patrick Wagstrom, James Herbsleb, Kathleen Carley. "Identification of Coordination Requirements: Implications for the Design of Collaboration and Awareness Tools". *20th Anniversary Conference on Computer Supported Cooperative Work*. Banff, Alberta, Canada. November 2006.

Patrick Wagstrom, James Herbsleb, Kathleen Carley. "A Social Network Approach to Free/Open Source Software Simulation". *1st International Conference on Open Source Software*. Genoa, Italy. July 2005.

Workshop Papers

Patrick Wagstrom, Anita Sarma. "Using Analytics to Support Decision Processes for Development and Design". *2012 Workshop on the Future of Collaborative Software Development*. Seattle, WA. February 2012.

Patrick Wagstrom. "Engineering Software Engineering Teams". *4th International Workshop on Social Software Engineering*. Szeged, Hungary. September 2011.

Jacquelyn Martino, Patrick Wagstrom. "Your Personal Brand: It's Not Just You". *2011 Workshop on Personal Informatics*. Vancouver, BC. May 2011.

Tim Klinger, Peri Tarr, Patrick Wagstrom, Clay Williams. "An Enterprise Perspective on Technical Debt". *2011 Workshop on Managing Technical Debt*. Honolulu, HI. May 2011.

Clay Williams, Patrick Wagstrom, Kate Ehrlich, Dick Gabriel, Tim Klinger, Jacquelyn Martino, Peri Tarr. "Supporting Enterprise Stakeholders in Software Projects". *Collaborative and Human Aspects of Software Engineering at ICSE 2010 (CHASE 2010)*. Cape Town, ZA. 2 May 2010.

Patrick Wagstrom, James Herbsleb, Kathleen Carley. "Decaying Socio-Technical Congruence as a Method to Account for Architectural Changes". *Workshop on Socio-Technical Congruence at ICSE 2009*. Vancouver, BC. May 2009.

James Herbsleb, Laura Dabbish, Patrick Wagstrom, Anita Sarma. "Supporting Coordination of Interdependent Work".

Thermochemical Table Framework". *Third International Workshop on Grid Computing, volume 2536 of Lecture Notes in Computer Science, pages 25-38*. Springer. Baltimore, MD. 18 November 2002.

Book Chapters

Gregor von Laszewski, Patrick Wagstrom. "Gestalt of the Grid". *Tools and Environments for Parallel and Distributed Computing*. Wiley. 2004.

Technical Reports

Sriram Krishnan, Patrick Wagstrom, Gregor von Laszewski. "GSFL: A Workflow Framework for Grid Services". *Preprint ANL/MCS-P980-0802, Argonne National Laboratory, 9700 S. Cass Avenue, Argonne, IL 60439*. August 2002.

Other Publications, Presentations, and Recognition

Patrick Wagstrom. "Don't Blame the Developers: External Stakeholders and the Tangled Web of Complex Software". *Invited Colloquium Speaker - University of Nebraska, Lincoln - Computer Science and Engineering Colloquium Series*. November 2011.

Patrick Wagstrom, Jacquelyn Martino, Juerg von Kaenel, Marshini Chetty, John Thomas, Laretta Jones. "A Dive into Online Community Properties [poster]". *Interactive Poster presented at 2011 ACM Conference on Computer Supported Cooperative Work*. Hangzhou, China. March 2011.

Patrick Wagstrom. "Be A Wonk!". *Ohio LinuxFest*. Columbus, OH. October 2009.

Patrick Wagstrom, Clay Williams, Mary Helander, Kate Ehrlich. "Understanding Communication, Coordination, and Congruence at an Individual Level By Harnessing Baseball Statistics". *28th International Sunbelt Social Network Conference*. St. Pete Beach, FL. February 2008.

Patrick Wagstrom. "Social Structure from Free/Open Source Weblogs". *25th International Sunbelt Social Network Conference*. Redondo Beach, CA. February 2005.

Awards and Honors

Best Paper: Academy of Management 2010 Annual Meeting, August 2010

"Communication, Team Performance, and the Individual: Bridging Technical Dependencies" was selected as one of the best papers from the Organizational Communication and Information Systems (OCIS) division at the 2010 Academy of Management annual meeting in Montreal, Canada.

Sloan Industry Studies 2009 Dissertation Award (2nd Place), May 2010

My doctoral thesis was awarded second place in the 2009 doctoral thesis competition from the Alfred P. Sloan Foundation.

Best Paper: CSCW 2006, November 2006

Awarded best paper for CSCW 2006 for "Identification of Coordination Requirements: Implications for the Design of Collaboration and Awareness Tools" with M. Cataldo, J. Herbsleb, and K. Carley.

National Science Foundation Graduate Research Fellowship, May 2004–May 2007

Three year highly competitive fellowship based on research potential supporting portions of tuition and stipend at Carnegie Mellon University.

Teaching Assistant of the Year, Department of Computer Science, Illinois Institute of Technology, December 2002

Given in recognition of work as teaching assistant for senior level undergraduate courses in computer architecture and operating systems.

Energy Research Undergraduate Laboratory Fellowship, United States Department of Energy, May 2002–August 2002

Competitive fellowship for junior and senior level undergraduates to pursue summer research at a United States Department of Energy research lab. This allowed to research grid and distributed computing at Argonne National Lab.

Styker Outstanding Student Leader Award, Illinois Institute of Technology, 1999–2001

Award given annually to the top 20-25 most outstanding student leaders at Illinois Institute of Technology. Three time recipient for my contributions to student government, Greek life, and service.

Camras/NExT Scholarship, Illinois Institute of Technology, August 1997–May 2002

Recipient of a competitive five year full tuition merit based academic scholarship.

Professional Memberships

IEEE, 2003–Present: The Institute for Electrical and Electronics Engineers. The professional society for computer engineers, electrical engineers, and computer scientists.

IEEE Computer Society, 2003–Present: Special interest group within IEEE for computer professionals.

ACM, 2003–Present: The Association for Computing Machinery, the society for computer scientists and computer professionals.

ACM SIGCHI, 2009–Present: Special interest group in ACM on computer-human interaction.

ACM SIGSoft, 2009–Present: Special interest group on software engineering.

INSNA, 2005–2008: International Network for Social Network Analysis, the professional society for researchers and practitioners of social network analysis.

Tau Beta Pi: Honor society for engineers. Inducted into the Illinois Beta chapter in 2000.

INFORMS, 2008–Present: Institute for Operations Research and Management Science.

Academy of Management, 2010–Present: The Academy of Management is the premiere professional organization for scholars and practitioners that create and disseminate knowledge about management and organizations.

Volunteer/Professional Service

CSCW 2011 Computing/AV Co-Chair (with Frank Liu): Basic planning of a network and AV support for the conference with the added twist of doing it in China.

CSCW 2008 Computing/AV Co-Chair (with Brian Amento): Designed and implemented a wireless network for 500 conference attendees in a location where traditional networks were unavailable.

Western Pennsylvania Linux Users Group President, 2006-2007: Instituted reforms in meeting schedule and increased membership by 30%.

Western Pennsylvania Linux Users Group Board Member, 2005-2007: Formalized accounting procedures. Fostered relationships with local tech community.

CSCW 2006 Student Volunteer: Managed wireless network for 500 attendees.

CSCW 2004 Computing Chair: Designed, ordered, and built a wireless network for conference attendees on four days notice after the hotel backed out of contract for wireless.

Reviewer: IEEE Transactions on Software Engineering, IEEE Transactions on Software Engineering Methodology, IEEE Transactions on Security and Privacy, Management Science, CSCW, CHI, ICSE, FSE, and numerous workshops.

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