

Nicholas Nelson

SOFTWARE ENGINEER · HCI RESEARCHER

Portland, Oregon, United States of America

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Education

Oregon State University

Corvallis, Oregon, USA

Ph.D. in Computer Science

Sep. 2015 - Jan. 2024

- Cumulative GPA: 3.57 / 4.00
- Dissertation: *Supporting Merge Comprehension when Resolving Merge Conflicts*
- Related Coursework: *Data-Driven Software Engineering, Software Engineering Methods, Field Studies in SE & HCI, Static Analysis & Model Checking in SE, Programming Languages I & II, Sensemaking in Software Development*
- Received Honorable Mention for Graduate Teaching 2018-2019.

Oregon State University

Corvallis, Oregon, USA

B.S. in Computer Science

Jan. 2012 - Jun. 2015

- Cumulative GPA: 3.35 / 4.00
- Minor: *Business and Entrepreneurship*
- Senior Project: *Clang AST Analysis and Repair: A Code Quality and Compliance Development Tool*
- Earned Honor Roll (GPA 3.5+) for four consecutive terms.

Portland Community College

Portland, Oregon, USA

A.S. in Computer Information Systems

Sep. 2007 - Dec. 2008

- Cumulative GPA: 3.34 / 4.00
- Received President's Award (GPA 3.8+) and Dean's Award (GPA 3.5+) for three consecutive terms.

Skills

Programming	TypeScript, Node.js, Python, Java/Kotlin, C/C++, Ruby, PHP, R, LaTeX
DevOps	Next.js, Webpack, Vite, Jest, Cypress, GitHub Actions, TravisCI, Jenkins, Playwright, Vagrant
Back-end	Chromium/Electron, Rails, MySQL, PostgreSQL, REST APIs
Front-end	Redux, React, HTML5, TailwindCSS, Bootstrap, LESS, CSS3
Languages	English, Spanish, German, Chinese (Mandarin)

Experience

Nomatic Software Consulting

Portland, Oregon, USA

Founder/Software Consultant

Jun. 2024 - Current

- Collaborate with customer stakeholders to develop comprehensive software solutions that meet current and future business needs.
- Deployed and configured Airtable cloud spreadsheet-database platform for managing customer inquiries, project pipelines, and invoicing for a local food innovation center that supports Oregon's \$5 billion agriculture industry with B2B food research and support.

Oregon State University

Corvallis, Oregon, USA

Graduate Research Assistant

Sep. 2015 - Jan. 2024

- Architect and lead developer of a visuospatial source-code editor for managing human context in digital environments (built with Electron, Vite, React, Redux, and TypeScript).
- Developed interactive visualizations of Git repositories for human-centric version control.
- Built fully automated CI/CD pipelines on TravisCI, GitHub Actions, and Conveyor for cross-platform builds, packaging, and testing.
- Implemented unit-testing and an E2E (end-to-end) testing infrastructure in Cypress and Jest.
- Conducted empirical research into developer perceptions of software merge conflict processes, difficulties, and tools. Results received Best Paper Award at ICSME 2017.
- Conducted research into developer perceptions of CI practices and pitfalls. Results received Best Paper Award at ESEC/FSE 2017 and has 250+ citations.

Oregon State University

Corvallis, Oregon, USA

Undergraduate Research Assistant

Mar. 2014 - Sep. 2015

- Conducted research on static analysis of Java/Kotlin code for automated refactoring of Android apps to inject dynamic permissions handling code that complies with Android 6.0's run-time permissions model.
- Developed a Ruby on Rails web application for visualizing developer adherence to the TDD (Test-Driven Development) process.

Microsoft Corp.

Seattle, Washington, USA

Graduate Research Intern, PROSE

Jun. 2019 - Sep. 2019

- Developed an interactive grid component plugin for JupyterLab interactive notebooks using Python, TypeScript, and CSS.
- Combined PBE (programming-by-example) and static type-inferencing techniques to create data analysis and formatting pipeline.
- Conducted qualitative HCI research into cognitive processes of recognizing ambient data in grid components.

Hewlett Packard Enterprise

Corvallis, Oregon, USA

Software Engineering Intern

Jun. 2013 - Sep. 2013

- Designed, proposed, and implemented warranty claims processing sub-system using Python and PHP to integrate into HP Web Press Dashboard web application.
- Implemented RESTful API service for ingesting printer consumables telemetry data from Inkjet High-Speed Product Solutions (IHPS) industrial printers for warranty claim validation.

Samaritan Health Services

Corvallis, Oregon, USA

Systems Analyst I

Apr. 2010 - Dec. 2012

- Provided technical support for 85 enterprise software applications deployed at various regional healthcare facilities including Schlage Industrial Lock Control, MySQL, PostgreSQL, and Polycom Teleconference Systems.
- Held primary application support role for 30 enterprise applications, including 24/7 support during on-call rotations.

Samaritan Health Services

Corvallis, Oregon, USA

Help Desk Analyst

Jul. 2008 - Apr. 2010

- Provided remote technical support for 7,000 healthcare employees at various regional healthcare facilities.
- Maintained a 99% yearly customer satisfaction rating for two consecutive years.

Intel Corp.

Hillsboro, Oregon, USA

Engineering Support Contractor

May. 2007 - Jul. 2008

- Developed a server deployment telemetry and provisioning application for enterprise-scale Linux/UNIX clusters using PHP and ColdFusion.
- Maintained operational and software security for 700 co-located Linux/UNIX servers across 5 global regions.
- Supported 6,000 production and test Linux/UNIX servers in use by electrical engineers and software developers.
- Developed SQL queries for automated weekly and monthly report generation of Linux/UNIX server cluster health analytics.

Publications

THESES

Supporting Merge Comprehension when Resolving Merge Conflicts

Nicholas Nelson

PhD Thesis, 2024, OREGON STATE UNIVERSITY

JOURNAL ARTICLES

Cognitive Biases in Software Development

Souti Chattopadhyay, Nicholas Nelson, Audrey Au, Natalia Morales, Christopher Sanchez, Rahul Pandita, Anita Sarma

Communications of the ACM 65.4 (APR. 2022) PP. 115–122. 2022

The Life-Cycle of Merge Conflicts: Processes, Barriers, and Strategies

Nicholas Nelson, Caius Brindescu, Shane McKee, Anita Sarma, Danny Dig

Empirical Software Engineering Journal (EMSE) 24.5 (FEB. 2019) PP. 2863–2906. 2019

CONFERENCE PROCEEDINGS

Supporting Code Comprehension via Annotations: Right Information at the Right Time and Place

Marjan Adeli, Nicholas Nelson, Souti Chattopadhyay, Hayden Coffey, Austin Henley, Anita Sarma

IEEE Symposium on Visual Languages and Human-Centric Computing (VL/HCC 2020), 2020, DUNEDIN, NEW ZEALAND

A Tale from the Trenches: Cognitive Biases and Software Development

Souti Chattopadhyay, Nicholas Nelson, Audrey Au, Natalia Morales, Christopher Sanchez, Rahul Pandita, Anita Sarma

42nd International Conference on Software Engineering (ICSE 2020), 2020, SEOUL, SOUTH KOREA

Latent Patterns in Activities: A Field Study of How Developers Manage Context

Souti Chattopadhyay, Nicholas Nelson, Yenifer Ramirez Gonzalez, Annel Amelia Leon, Rahul Pandita, Anita Sarma

41st International Conference on Software Engineering (ICSE 2019), 2019, MONTRÉAL, QUEBEC, CANADA

Context in Programming: An Investigation of How Programmers Create Context

Souti Chattopadhyay, Nicholas Nelson, Thien Nam, McKenzie Calvert, Anita Sarma

11th International Workshop on Cooperative and Human Aspects of Software Engineering (CHASE 2018), 2018, GOTHENBURG, SWEDEN

Software Practitioner Perspectives on Merge Conflicts and Resolutions

Shane McKee*, Nicholas Nelson*, Anita Sarma, Danny Dig

33rd International Conference on Software Maintenance and Evolution (ICSME 2017), 2017, SHANGHAI, CHINA

Trade-offs in Continuous Integration: Assurance, Security, and Flexibility

Shane McKee*, Nicholas Nelson*, Anita Sarma, Danny Dig

Problem-Solving Applications in Developer Environments

Nicholas Nelson

28th Annual Workshop of the Psychology of Programming Interest Group (PPIG 2017), 2017, DELFT, THE NETHERLANDS

Towards an IDE to Support Programming as Problem-Solving

Nicholas Nelson, Anita Sarma, André Hoek

28th Annual Workshop of the Psychology of Programming Interest Group (PPIG 2017), 2017, DELFT, THE NETHERLANDS

TDDViz: Using Software Changes to Understand Conformance to Test Driven Development

Michael Hilton, Nicholas Nelson, Hugh McDonald, Sean McDonald, Ron Metoyer, Danny Dig

17th International Conference on Agile Processes, in Software Engineering, and Extreme Programming (XP 2016), 2016, EDINBURGH, UNITED KINGDOM

Honors & Awards

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|------|--|----------------------|
| 2020 | ACM SIGSOFT Distinguished Paper Award , International Conference on Software Engineering (ICSE 2020) | Seoul, S. Korea |
| 2019 | ACM SIGSOFT CAPS Travel Support Award , International Conference on Software Engineering (ICSE 2019) | Montréal, QC, Canada |
| 2017 | IEEE TCSE Distinguished Paper Award , International Conference on Software Maintenance and Evolution (ICSME 2017) | Shanghai, China |
| 2017 | ACM SIGSOFT Distinguished Paper Award , Joint Meeting on Foundations of Software Engineering (ESEC/FSE 2017) | Paderborn, Germany |

Teaching

Oregon State University

Corvallis, Oregon, USA

Graduate Teaching Assistant

Jan. 2016 - Jan. 2024

- CS567: Laboratory Studies in Software Engineering and Human-Computer Interaction (Fall 2021)
- CS560: Data-Driven Software Engineering (Fall 2020)
- CS419/579: Usable Security (Winter 2020)
- CS362: Software Engineering II (Spring 2020, Spring 2022)
- CS361: Software Engineering I (Winter 2022, Fall 2017, Winter 2016)
- CS344: Operating Systems I (Winter 2023, Fall 2022)

Undergraduate Teaching Assistant

Sep. 2013 - Jun. 2014

- CS162: Introduction to Computer Science II (Winter 2013, Spring 2013)
- CS161: Introduction to Computer Science I (Spring 2014, Winter 2014, Fall 2012)
- CS160: Computer Science Orientation (Fall 2013)

Service

PROGRAM COMMITTEES

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| 2020 | PC Member for Replication Challenge Track , 16th International Conference on Predictive Models and Data Analytics in Software Engineering (PROMISE 2020) | Sacramento, California, USA |
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VOLUNTEER

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|------|--|--------|
| 2020 | Graduate Student Representation , EECS Graduate Curriculum Committee, Oregon State University | USA |
| 2019 | Student Volunteer , 41st International Conference on Software Engineering (ICSE 2019) | Canada |
| 2017 | Video Game Workshop Lead , ChickTech Corvallis Annual Summer Kickoff Event | USA |

PEER REVIEW

2023	Reviewer , ACM Transactions on Software Engineering and Methodology (TOSEM)	
2022	Reviewer , Empirical Software Engineering Journal (ESE)	
2020	Reviewer , IEEE Transactions on Software Engineering Journal (TSE)	
2020	Reviewer , Empirical Software Engineering Journal (ESE)	
2020	Sub-Reviewer , 28th ACM Joint European Software Engineering Conference and Symposium on the Foundations of Software Engineering (ESEC/FSE 2020)	USA
2020	Sub-Reviewer , 28th IEEE/ACM International Conference on Program Comprehension (ICPC 2020)	South Korea
2019	Sub-Reviewer , 34th IEEE/ACM International Conference on Automated Software Engineering (ASE 2019)	USA
2019	Sub-Reviewer , 27th ACM Joint European Software Engineering Conference and Symposium on the Foundations of Software Engineering (ESEC/FSE 2019)	Estonia
2019	Sub-Reviewer , IEEE Symposium on Visual Languages and Human-Centric Computing (VL/HCC 2019)	USA
2018	Sub-Reviewer , 33rd IEEE/ACM International Conference on Automated Software Engineering (ASE 2018)	France
2017	Sub-Reviewer , 14th International Conference on Mining Software Repositories (MSR 2017)	Argentina
2017	Sub-Reviewer , 30th Annual ACM Symposium on User Interface Software and Technology (UIST 2017)	Canada
2017	Sub-Reviewer , 32nd IEEE/ACM International Conference on Automated Software Engineering (ASE 2017)	USA
2015	Sub-Reviewer , 3th IEEE/ACM International Conference on Automated Software Engineering (ASE 2015)	USA