

Nicholas NELSON

PhD Candidate, Computer Science | Software Developer

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PhD student in Computer Science focusing on software engineering (SE), human-computer interaction (HCI), user interfaces, and developer tools. I am exploring the effects of human problem-solving processes on the use of integrated development environments (IDEs). I also conduct research into software development processes such as merge conflicts, continuous integration (CI), and test-driven development (TDD). I have experience using TypeScript, Java, CSS, C/C++, SQL, Python, PHP, JSON, and R.

EDUCATION

- 2015–Current **Ph.D** in Computer Science at Oregon State University (Advisor: Anita Sarma)
- 2015 **B.S.** in Computer Science at Oregon State University (Minor: Business & Entrepreneurship)
- 2008 **A.S.** in Computer Information Systems at Portland Community College
- 2008 **A.S.** in General Studies at Portland Community College
- 2003 **H.S. Diploma** at South Albany High School

EMPLOYMENT

- Present**
September 2015 **Graduate Research & Teaching Assistant, OREGON STATE UNIVERSITY, USA**
 - Developed architecture and platform for a highly-configurable context-oriented IDE.
 - Conducted empirical research into cognitive processes of problem-solving and context management during software development.
 - Conducted research into developer perceptions of software merge conflict processes and tools.
 - Developed IntelliJ Idea plugin to analyze and refactor Android Java code written for API 6/7 security to use API 8 runtime permissions.
 - Assisted with research into developer perceptions of Continuous Integration (CI) practices and tools.
 - Reviewed submitted manuscripts for prominent software engineering conferences.

Typescript Javascrpt React Redux jQuery CSS NodeJS LaTeX IntelliJ Idea Git Maven Gradle Groovy

Android Studio Android 8 API TravisCI Jenkins JSON R RStudio Haskell Idris Prolog
- September 2019**
June 2019 **Research Intern – Program Synthesis, MICROSOFT CORPORATION, USA**
 - Developed an interactive grid component for tabular data in JupyterLab interactive notebooks.
 - Combined program synthesis by example techniques for interactive data analysis and formatting.
 - Evaluated ambient data understanding of the grid component through empirical user studies.

Typescript React Python JupyterLab CSS Visual Studio Code
- September 2015**
March 2014 **Undergraduate Research Assistant, OREGON STATE UNIVERSITY, USA**
 - Member of Change-Oriented Programming Environment (COPE) research group.
 - Assisted with research into predictive code analysis and visualization of Test-Driven Development (TDD) developer processes.

Java IntelliJ Idea Git Maven LaTeX Eclipse R RStudio Ninja Framework Ruby Python XML
- March 2014**
September 2013 **Undergraduate Teaching Assistant, OREGON STATE UNIVERSITY, USA**
 - Instructed recitation labs for 30–40 freshman and sophomore computer science students enrolled in Computer Science Orientation (CS160), Introduction to Computer Science I (CS161), and Introduction to Computer Science II (CS162) courses.
 - Developed training and evaluation material for new teaching assistants.

Python Java C/C++ PyCharm IntelliJ Idea
- September 2013**
June 2013 **Process Engineering Intern, HEWLETT PACKARD ENTERPRISE, USA**
 - Member of PPS - Inkjet High-Speed Production Solutions (IHPS) division.
 - Designed, proposed, and implemented warranty processing and validation code for HP Web Press consumable products.
 - Integrated file code with HP Web Press Dashboard web applications.

Python PHP Perl Bash

December 2012 April 2010	System Analyst I, SAMARITAN HEALTH SERVICES, USA <ul style="list-style-type: none"> Member of Information Services (IS) division. Provided technical support, evaluation, deployment, maintenance, project management, and sunset strategizing for 85 enterprise software applications. Maintained primary application support for 30 enterprise applications, including 24/7 support during on-call rotations. <div> Oracle SQL MySQL PostgreSQL Microsoft Windows Server Bomgar Remote Access Schlage Lock Control Software </div> <div> ViewPAK Boiler System Microsoft SharePoint Microsoft Active Directory </div>
April 2010 July 2008	Help Desk Analyst, SAMARITAN HEALTH SERVICES, USA <ul style="list-style-type: none"> Member of Information Services (IS) division. Provided technical support for 7,000 healthcare employees. Maintained a 99% yearly customer satisfaction rating. Answered 13,000 phone calls and 7,000 support emails per year. <div> BMC Remedy Service Management Polycom Teleconference LogMeIn Remote Control </div>
July 2008 October 2007	UNIX Server Operations Intern, INTEL CORPORATION, USA <ul style="list-style-type: none"> Developed interactive web applications for server systems rack polling and management. Supported 6,000 production and test UNIX/Linux servers in active use by engineers and developers. Maintained operational security for 700 highly secure hardened UNIX/Linux servers co-located in secure global facilities. <div> ColdFusion PHP Java Python Perl </div>
October 2007 May 2007	Engineering Computing Support Intern, INTEL CORPORATION, USA <ul style="list-style-type: none"> Provided technical support for 19,000 Engineering and Product Development employees. Supported 160+ enterprise software products across 14 different global sites. Developed SQL queries and reports for weekly and monthly support statistics. <div> BMC Remedy Service Management TrueWindow Remote Access Control Microsoft Active Directory </div>

PEER-REVIEWED PUBLICATIONS

* co-first author.

- [11] Souti Chattopadhyay, **Nicholas Nelson**, Audrey Au, Natalia Morales, Christopher Sanchez, Rahul Pandita, and Anita Sarma. *Cognitive Biases in Software Development*. Communications of the ACM, April 2022.
- [10] Marjan Adeli, **Nicholas Nelson**, Souti Chattopadhyay, Hayden Coffey, Austin Henley, and Anita Sarma. *Supporting Code Comprehension via Annotations: Right Information at the Right Time and Place*. Proceedings of the IEEE Symposium on Visual Languages and Human-Centric Computing (VL/HCC'20), August 2020. Acceptance ratio: 30.0% (15/50).
- [9] Souti Chattopadhyay, **Nicholas Nelson**, Audrey Au, Natalia Morales, Christopher Sanchez, Rahul Pandita, and Anita Sarma. *A Tale from the Trenches: Cognitive Biases and Software Development*. Proceedings of the ACM/IEEE International Conference on Software Engineering (ICSE'20), July 2020. Acceptance ratio: 20.9% (129/617). 🏆 **ACM SIGSOFT Distinguished Paper Award**.
- [8] Souti Chattopadhyay, **Nicholas Nelson**, Yenifer Ramirez Gonzalez, Annel Amelia Leon, Rahul Pandita, and Anita Sarma. *Latent Patterns in Activities: A Field Study of How Developers Manage Context*. Proceedings of the ACM/IEEE International Conference on Software Engineering (ICSE'19), May 2019. Acceptance ratio: 20.6% (109/529).
- [7] **Nicholas Nelson**, Caius Brindescu, Shane McKee, Anita Sarma, and Danny Dig. *The Life-Cycle of Merge Conflicts: Processes, Barriers, and Strategies*. Empirical Software Engineering Journal (EMSE), February 2019.
- [6] Souti Chattopadhyay, **Nicholas Nelson**, Thien Nam, McKenzie Calvert, and Anita Sarma. *Context in Programming: An Investigation of How Programmers Create Context*. Proceedings of the IEEE ICSE Workshop on Cooperative and Human Aspects of Software Engineering (CHASE'18), May 2018.
- [5] Shane McKee*, **Nicholas Nelson***, Anita Sarma, and Danny Dig. *Software Practitioner Perspectives on Merge Conflicts and Resolutions*. Proceedings of IEEE International Conference on Software Maintenance and Evolution (ICSME'17), Sep 2017. Acceptance ratio: 27.8% (42/151). 🏆 **IEEE TCSE Distinguished Paper Award**.
- [4] Michael Hilton, **Nicholas Nelson**, Timothy Tunnell, Darko Marinov, and Danny Dig. *Trade-offs in Continuous Integration: Assurance, Security, and Flexibility*. Proceedings of ACM SIGSOFT Symposium on the Foundations of Software Engineering (FSE'17), Sep 2017. Acceptance ratio: 24.4% (72/295). 🏆 **ACM SIGSOFT Distinguished Paper Award**.
- [3] **Nicholas Nelson**, Anita Sarma, and André van der Hoek. *Towards an IDE to Support Programming as Problem-Solving*. Proceedings of the Psychology of Programming Interest Group Workshop (PPIG'17), Jul 2017. Acceptance ratio: 84.0% (21/25).
- [2] **Nicholas Nelson**. *Problem-Solving Applications in Developer Environments*. pages 179–180. Proceedings of the Psychology of Programming Interest Group Workshop (PPIG'17), Jul 2017. Acceptance ratio: 90.0% (9/10).

- [1] Michael Hilton, **Nicholas Nelson**, Hugh McDonald, Sean McDonald, Ron Metoyer, and Danny Dig. *TDDViz: Using Software Changes to Understand Conformance to Test Driven Development*. pages 53–65. Proceedings of the International Conference on Agile Processes, in Software Engineering, and Extreme Programming (XP'16), May 2016. Acceptance ratio: 33.3% (14/42).

LANGUAGES

English	●	●	●	●	●
Spanish	●	●	○	○	○
German	●	●	○	○	○
Mandarin	●	○	○	○	○
Japanese	●	○	○	○	○

AWARDS

- > ACM SIGSOFT Distinguished Paper Award at ICSE'20
- > ACM SIGSOFT CAPS Travel Support Award at ICSE'19
- > Honorable Mention Award for OSU EECS Graduate Students 2018–2019
- > IEEE TCSE Distinguished Paper Award at ICSME'17
- > ACM SIGSOFT Distinguished Paper Award at FSE'17
- > Honor Roll at OSU for Winter'15, Fall'14, Winter'14, Spring'14
- > President's List at PCC for Spring'08
- > Dean's List at PCC for Winter'08, Fall'07, Winter'07

SERVICE

2020	<p>PC Member, 16TH INTERNATIONAL CONFERENCE ON PREDICTIVE MODELS AND DATA ANALYTICS IN SOFTWARE ENGINEERING, REPLICATION CHALLENGE TRACK Sacramento, California, USA</p> <p>Reviewer, IEEE TRANSACTIONS ON SOFTWARE ENGINEERING (TSE) Journal</p> <p>Graduate Student Representative, EECS GRADUATE CURRICULUM COMMITTEE School of EECS, Oregon State University, Corvallis, Oregon, USA</p> <p>Sub-Reviewer, 28TH ACM JOINT EUROPEAN SOFTWARE ENGINEERING CONFERENCE AND SYMPOSIUM ON THE FOUNDATIONS OF SOFTWARE ENGINEERING (ESEC/FSE 2020) Sacramento, California, USA</p> <p>Reviewer, EMPIRICAL SOFTWARE ENGINEERING (EMSE) Journal</p> <p>Sub-Reviewer, 28TH IEEE/ACM INTERNATIONAL CONFERENCE ON PROGRAM COMPREHENSION (ICPC 2020) Seoul, South Korea</p>
2019	<p>Student Volunteer, 41ST ACM/IEEE INTERNATIONAL CONFERENCE ON SOFTWARE ENGINEERING (ICSE 2019) Montreal, Canada</p> <p>Sub-Reviewer, 20TH IEEE SYMPOSIUM ON VISUAL LANGUAGES & HUMAN-CENTRIC COMPUTING (VL/HCC 2019) Memphis, Tennessee, USA</p> <p>Sub-Reviewer, 27TH ACM JOINT EUROPEAN SOFTWARE ENGINEERING CONFERENCE AND SYMPOSIUM ON THE FOUNDATIONS OF SOFTWARE ENGINEERING (ESEC/FSE 2019) Tallinn, Estonia</p> <p>Sub-Reviewer, 34TH IEEE/ACM INTERNATIONAL CONFERENCE ON AUTOMATED SOFTWARE ENGINEERING (ASE 2019) San Diego, California, USA</p>
2018	<p>Sub-Reviewer, 33RD IEEE/ACM INTERNATIONAL CONFERENCE ON AUTOMATED SOFTWARE ENGINEERING (ASE 2018) Montpellier, France</p>
2016–2018	<p>Steward, COALITION OF GRADUATE EMPLOYEES LOCAL 6069 (AFT, AFL-CIO), USA</p> <ul style="list-style-type: none"> > Graduate employee representative for Electrical Engineering and Computer Science (EECS).
2017	<p>Video Game Workshop Lead, CHICKTECH CORVALLIS, USA</p> <ul style="list-style-type: none"> > Developed instructional material for 2017 ChickTech Corvallis Annual Summer Kickoff Event for 200–300 high school girls interested in science and technology. <p>Sub-Reviewer, 32ND IEEE/ACM INTERNATIONAL CONFERENCE ON AUTOMATED SOFTWARE ENGINEERING (ASE 2017) Urbana-Champaign, Illinois, USA</p> <p>Sub-Reviewer, 30TH ACM SYMPOSIUM ON USER INTERFACE SOFTWARE AND TECHNOLOGY (UIST 2017) Quebec City, Canada</p> <p>Sub-Reviewer, 14TH INTERNATIONAL CONFERENCE ON MINING SOFTWARE REPOSITORIES (MSR 2017) Buenos Aires, Argentina</p>
2015	<p>Sub-Reviewer, 30TH IEEE/ACM INTERNATIONAL CONFERENCE ON AUTOMATED SOFTWARE ENGINEERING (ASE 2015) Lincoln, Nebraska, USA</p>

REFERENCES

Dr. Anita Sarma

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