

## Michael Hilton

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CONTACT INFORMATION	<a href="#">Institute for Software Research</a> <a href="#">School of Computer Science</a> <a href="#">Carnegie Mellon University</a>	+1(412)268-7671 <a href="mailto:mhilton@cmu.edu">mhilton@cmu.edu</a> <a href="http://www.cs.cmu.edu/~mhilton">http://www.cs.cmu.edu/~mhilton</a>
RESEARCH INTERESTS	My main interest is both improving developer practices, and learning how to better teach those improved practices. Some specific areas of interest to me are: continuous integration, improving software engineering education, software engineering at startups, mob programming, structured editors and mobile computing.	
APPOINTMENTS	<a href="#">Carnegie Mellon University</a> , Pittsburgh, PA USA 2020 - Present Associate Teaching Professor, Faculty Coordinator, Undergraduate Teaching 2017 - 2020 Assistant Teaching Professor <a href="#">Institute for Software Research (ISR)</a> <a href="#">School of Computer Science (SCS)</a>	
EDUCATION	<a href="#">Oregon State University</a> , Corvallis, OR USA Ph.D., <a href="#">Computer Science</a> , June 2017 <ul style="list-style-type: none"><li>• Advisor: <a href="#">Dr. Danny Dig</a></li><li>• Area of Study: Software Engineering</li><li>• Thesis Topic: <i>Understanding and Improving Agile Development Practices</i></li></ul> <a href="#">California Polytechnic State University</a> , San Luis Obispo, CA USA M.S., <a href="#">Computer Science</a> , March 2013 <ul style="list-style-type: none"><li>• Advisor: <a href="#">Dr. David Janzen</a></li><li>• Area of Study: Software Engineering</li><li>• Thesis Topic: <i>Improving WebIDE through delightful design and gamification</i></li></ul> <a href="#">San Diego State University</a> , San Diego, CA USA B.S., <a href="#">Computer Science</a> , May 2002, <i>Cum Laude</i> <a href="#">Grossmont Community College</a> , El Cajon, CA USA A.S., May 1999	
AWARDS AND HONORS	<b>Wimmer Faculty Fellows 2020-21</b> Eberly Center for Teaching Excellence and Educational Innovation <b>Facebook TAV award - 2019</b> Search-based inducement and repair of latent test flakiness Philip McMinn (University of Sheffield), Gregory M. Kapfhammer (Allegheny College), Michael Hilton (Carnegie Mellon University), and Owain Parry (University of Sheffield) <b>ACM SIGSOFT Distinguished Paper Award</b> Awarded to the top papers at a conference. Received at FSE 2017. <b>ACM SIGSOFT Distinguished Paper Award</b> Awarded to the top papers at a conference. Received at FSE 2016. <b>J.L. Moore Doctoral Fellowship</b> Awarded to Cal Poly CSC graduates who pursue Doctoral Studies in Computer Science. Received 2013,2014,2015	
TEACHING EXPERIENCE	<a href="#">Carnegie Mellon University</a> , Pittsburgh, PA USA <ul style="list-style-type: none"><li>• Fall '21 - 17-313 Foundations of Software Engineering</li><li>• Fall '21 - 17-625 Design Patterns &amp; API Design</li><li>• Spring '21 - 17-356 Software Engineering for Startups</li><li>• Spring '21 - 17-450/17-950 Crafting Software</li><li>• Fall '20 - 17-313 Foundations of Software Engineering</li></ul>	

- Fall '20 - 17-400/700 Machine Learning and Data Science at Scale
- Spring '20 - 15-890 Computer Science Pedagogy
- Spring '20 - 17-356 Software Engineering for Startups
- Spring '20 - 17-413 Software Engineering Practicum
- Fall '19 - 17-313 Foundations in Software Engineering.
- Fall '19 - 17-437 Webapps.
- Spring '19 - 17-356 Software Engineering for Startups.
- Spring '19 - 17-413 Software Engineering Practicum.
- Spring '19 - 17-214: Principles of Software Construction: Objects, Design, and Concurrency.
- Fall '18 - 15-890 CS Pedagogy.
- Fall '18 - 17-313 Foundations in Software Engineering.
- Spring '18 - 17-356 Software Engineering for Startups.
- Spring '18 - 17-413 Software Engineering Practicum.
- Fall '17 - 15-214: Principles of Software Construction: Objects, Design, and Concurrency.

**Oregon State University**, Corvallis, OR USA

- Winter '16 - CS361: Software Engineering
- Fall '16 - CS/ECE507 - Graduate Seminar (Introduction to Grad School)

**California Polytechnic State University**, San Luis Obispo, CA USA

- Spring '13 - CSC/CPE 101 Fundamentals of Computer Science I

**PUBLICATIONS**

**Conferences**

1. Parry, O., G. M. Kapfhammer, M. Hilton, and P. McMinn (2022). A Survey of Flaky Tests. In: *ACM Trans. Softw. Eng. Methodol.* **31**(1), 17:1–17:74. doi: [10.1145/3476105](https://doi.org/10.1145/3476105). <https://doi.org/10.1145/3476105>.
2. Alshammari, A., C. Morris, M. Hilton, and J. Bell (2021). FlakeFlagger: Predicting Flakiness Without Rerunning Tests. In: *43rd IEEE/ACM International Conference on Software Engineering, ICSE 2021, Madrid, Spain, 22-30 May 2021*. IEEE, pp.1572–1584. doi: [10.1109/ICSE43902.2021.00140](https://doi.org/10.1109/ICSE43902.2021.00140). <https://doi.org/10.1109/ICSE43902.2021.00140>.
3. Sankaranarayanan, S., S. R. Kandimalla, C. Bogart, R. C. Murray, M. Hilton, M. Sakr, and C. P. Rosé (2021). Combining Collaborative Reflection based on Worked-Out Examples with Problem-Solving Practice: Designing Collaborative Programming Projects for Learning at Scale. In: *L@S'21: Eighth ACM Conference on Learning @ Scale, Virtual Event, Germany, June 22-25, 2021*. Ed. by C. Meinel, M. Pérez-Sanagustín, M. Specht, and A. Ogan. ACM, pp.255–258. doi: [10.1145/3430895.3460152](https://doi.org/10.1145/3430895.3460152). <https://doi.org/10.1145/3430895.3460152>.
4. Timperley, C. S., L. Herckis, C. L. Goues, and M. Hilton (2021). Understanding and improving artifact sharing in software engineering research. In: *Empir. Softw. Eng.* **26**(4), 67. doi: [10.1007/s10664-021-09973-5](https://doi.org/10.1007/s10664-021-09973-5). <https://doi.org/10.1007/s10664-021-09973-5>.
5. Afzal, A., C. L. Goues, M. Hilton, and C. S. Timperley (2020). A Study on Challenges of Testing Robotic Systems. In: *13th IEEE International Conference on Software Testing, Validation and Verification, ICST 2020, Porto, Portugal, October 24-28, 2020*. IEEE, pp.96–107. doi: [10.1109/ICST46399.2020.00020](https://doi.org/10.1109/ICST46399.2020.00020). <https://doi.org/10.1109/ICST46399.2020.00020>.
6. Durieux, T., C. L. Goues, M. Hilton, and R. Abreu (2020). Empirical Study of Restarted and Flaky Builds on Travis CI. In: *MSR '20: 17th International Conference on Mining Software Repositories, Seoul, Republic of Korea, 29-30 June, 2020*. Ed. by S. Kim, G. Gousios, S. Nadi, and J. Hejderup. ACM, pp.254–264. doi: [10.1145/3379597.3387460](https://doi.org/10.1145/3379597.3387460). <https://doi.org/10.1145/3379597.3387460>.

7. Kolak, S., A. Afzal, C. L. Goues, M. Hilton, and C. S. Timperley (2020). It Takes a Village to Build a Robot: An Empirical Study of The ROS Ecosystem. In: *IEEE International Conference on Software Maintenance and Evolution, ICSME 2020, Adelaide, Australia, September 28 - October 2, 2020*. IEEE, pp.430–440. doi: [10 . 1109 / ICSME46990 . 2020 . 00048](https://doi.org/10.1109/ICSME46990.2020.00048). <https://doi.org/10.1109/ICSME46990.2020.00048>.
8. Sankaranarayanan, S., S. R. Kandimalla, S. Hasan, H. An, C. Bogart, R. C. Murray, M. Hilton, M. Sakr, and C. P. Rosé (2020). Agent-in-the-Loop: Conversational Agent Support in Service of Reflection for Learning During Collaborative Programming. In: *Artificial Intelligence in Education - 21st International Conference, AIED 2020, Ifrane, Morocco, July 6-10, 2020, Proceedings, Part II*. Ed. by I. I. Bittencourt, M. Cukurova, K. Muldner, R. Luckin, and E. Millán. Vol. 12164. Lecture Notes in Computer Science. Springer, pp.273–278. doi: [10 . 1007 / 978 - 3 - 030 - 52240 - 7 \ \\_50](https://doi.org/10.1007/978-3-030-52240-7_50). [https://doi.org/10.1007/978-3-030-52240-7\\_50](https://doi.org/10.1007/978-3-030-52240-7_50).
9. Nguyen, H. A., T. N. Nguyen, D. Dig, S. Nguyen, H. Tran, and M. Hilton (2019). Graph-based mining of in-the-wild, fine-grained, semantic code change patterns. In: *Proceedings of the 41st International Conference on Software Engineering, ICSE 2019, Montreal, QC, Canada, May 25-31, 2019*, pp.819–830. <https://dl.acm.org/citation.cfm?id=3339608>.
10. Sankaranarayanan, S., X. Wang, C. Dashti, M. An, C. Ngoh, M. Hilton, M. Sakr, and C. P. Rosé (2019). An Intelligent-Agent Facilitated Scaffold for Fostering Reflection in a Team-Based Project Course. In: *Artificial Intelligence in Education - 20th International Conference, AIED 2019, Chicago, IL, USA, June 25-29, 2019, Proceedings, Part II*. Ed. by S. Isotani, E. Millán, A. Ogan, P. M. Hastings, B. M. McLaren, and R. Luckin. Vol. 11626. Lecture Notes in Computer Science. Springer, pp.252–256. doi: [10 . 1007 / 978 - 3 - 030 - 23207 - 8 \ \\_47](https://doi.org/10.1007/978-3-030-23207-8_47). [https://doi.org/10.1007/978-3-030-23207-8\\_47](https://doi.org/10.1007/978-3-030-23207-8_47).
11. Widder, D. G., M. Hilton, C. Kästner, and B. Vasilescu (2019). A conceptual replication of continuous integration pain points in the context of Travis CI. In: *Proceedings of the ACM Joint Meeting on European Software Engineering Conference and Symposium on the Foundations of Software Engineering, ESEC/SIGSOFT FSE 2019, Tallinn, Estonia, August 26-30, 2019*. Ed. by M. Dumas, D. Pfahl, S. Apel, and A. Russo. ACM, pp.647–658. doi: [10 . 1145 / 3338906 . 3338922](https://doi.org/10.1145/3338906.3338922). <https://doi.org/10.1145/3338906.3338922>.
12. Bell, J., O. Legunsen, M. Hilton, L. Eloussi, T. Yung, and D. Marinov (2018). DeFlaker: automatically detecting flaky tests. In: *Proceedings of the 40th International Conference on Software Engineering, ICSE 2018, Gothenburg, Sweden, May 27 - June 03, 2018*, pp.433–444. doi: [10 . 1145 / 3180155 . 3180164](https://doi.org/10.1145/3180155.3180164). <http://www.cs.cmu.edu/~mhilton/docs/icse18-deflaker.pdf>.
13. Hilton, M. and A. Begel (2018). A study of the organizational dynamics of software teams. In: *Proceedings of the 40th International Conference on Software Engineering: Software Engineering in Practice, ICSE (SEIP) 2018, Gothenburg, Sweden, May 27 - June 03, 2018*, pp.191–200. doi: [10 . 1145 / 3183519 . 3183527](https://doi.org/10.1145/3183519.3183527). <http://www.cs.cmu.edu/~mhilton/docs/p191-hilton.pdf>.
14. Hilton, M., J. Bell, and D. Marinov (2018). A large-scale study of test coverage evolution. In: *Proceedings of the 33rd ACM/IEEE International Conference on Automated Software Engineering, ASE 2018, Montpellier, France, September 3-7, 2018*. <http://www.cs.cmu.edu/~mhilton/docs/ase18coverage.pdf>.
15. Widder, D. G., M. Hilton, C. Kästner, and B. Vasilescu (2018). I’m leaving you, Travis: a continuous integration breakup story. In: *Proceedings of the 15th International Conference on Mining Software Repositories, MSR 2018, Gothenburg, Sweden, May 28-29, 2018*, pp.165–169. doi: [10 . 1145 / 3196398 . 3196422](https://doi.org/10.1145/3196398.3196422). <http://www.cs.cmu.edu/~mhilton/docs/msr18ci.pdf>.
16. Hilton, M., N. Nelson, T. Tunnell, D. Marinov, and D. Dig (2017). Trade-offs in continuous integration: assurance, security, and flexibility. In: *Proceedings of the 2017 11th Joint Meeting on Foundations of Software Engineering, ESEC/FSE 2017, Paderborn,*

- Germany, September 4-8, 2017, pp.197–207. doi: 10 . 1145 / 3106237 . 3106270. [http://www.cs.cmu.edu/~mhilton/docs/Hilton\\_CI\\_Tradeoffs.pdf](http://www.cs.cmu.edu/~mhilton/docs/Hilton_CI_Tradeoffs.pdf).
17. Omar, C., I. Voysey, M. Hilton, J. Aldrich, and M. A. Hammer (2017). Hazelnut: a bidirectionally typed structure editor calculus. In: *Proceedings of the 44th ACM SIGPLAN Symposium on Principles of Programming Languages, POPL 2017, Paris, France, January 18-20, 2017*, pp.86–99. <https://arxiv.org/abs/1607.04180>.
  18. Hilton, M., N. Nelson, H. McDonald, S. McDonald, R. Metoyer, and D. Dig (2016). TDDViz: Using Software Changes to Understand Conformance to Test Driven Development. In: *Proceedings of Agile Processes, in Software Engineering, and Extreme Programming: 17th International Conference. XP 2016*. <http://www.cs.cmu.edu/~mhilton/publications/2016/TDDViz.pdf>.
  19. Hilton, M., T. Tunnell, K. Huang, D. Marinov, and D. Dig (2016). Usage, costs, and benefits of continuous integration in open-source projects. In: *Proceedings of the 31st IEEE/ACM International Conference on Automated Software Engineering. ASE 2016*. <http://cope.eecs.oregonstate.edu/papers/OpenSourceCIUsage.pdf>.
  20. Nguyen, A. T., M. Hilton, M. Codoban, H. A. Nguyen, L. Mast, E. Rademacher, T. N. Nguyen, and D. Dig (2016). API code recommendation using statistical learning from fine-grained changes. In: *Proceedings of the 2016 24th ACM SIGSOFT International Symposium on Foundations of Software Engineering. FSE 2016*. [http://www.cs.cmu.edu/~mhilton/publications/2016/APIRec\\_fse16.pdf](http://www.cs.cmu.edu/~mhilton/publications/2016/APIRec_fse16.pdf).
  21. Hilton, M., A. Christi, D. Dig, M. Moskal, S. Burckhardt, and N. Tillmann (2014). Refactoring local to cloud data types for mobile apps. In: *Proceedings of the 1st International Conference on Mobile Software Engineering and Systems. MOBILESft 2014*. <http://cope.eecs.oregonstate.edu/papers/RefactorToCloud.pdf>.
  22. Janzen, D. S., J. Clements, and M. Hilton (2013). An evaluation of interactive test-driven labs with WebIDE in CS0. In: *Proceedings of the 2013 International Conference on Software Engineering. ICSE 2013*. <http://dl.acm.org/citation.cfm?id=2486788.2486938&coll=DL&dl=GUIDE>.
  23. Hilton, M. and D. S. Janzen (2012). On teaching arrays with test-driven learning in WebIDE. In: *Proceedings of the 17th ACM annual conference on Innovation and technology in computer science education. ITiCSE 2012*. <http://dl.acm.org/citation.cfm?id=2325296.2325322&coll=DL&dl=GUIDE>.

PROFESSIONAL EXPERIENCE	<b>Microsoft Research</b> , Redmond, WA USA <i>Research Intern</i> May 2017 to August 2017
	<ul style="list-style-type: none"> <li>Studied how and why developers move between development teams</li> </ul>
	<b>Steadfast Innovation</b> , San Luis Obispo, CA USA <i>Mobile HTML5 developer</i> March 2013 to August 2013
	<ul style="list-style-type: none"> <li>Developed HTML5 mobile app with real-time shared drawing capabilities</li> </ul>
	<b>Independent Contractor</b> , San Luis Obispo, CA USA <i>Software Developer</i> August 2011 to March 2013
	<ul style="list-style-type: none"> <li>Worked remotely with Loan-management Software Company</li> <li>Developed applications to transition data using ASP.Net applications</li> <li>Worked closely with project manager to ensure correct transistion</li> </ul>
	<b>Space and Naval Warfare Systems Center - Pacific</b> , San Diego, CA USA <i>Software Engineer/Scientist</i> June 2002 to August 2011
	<ul style="list-style-type: none"> <li><b>Team Lead White House Situation Room Upgrade Project</b> <ul style="list-style-type: none"> <li>Team lead for Server portion of White House Situation Room Upgrade Project.</li> <li>Responsible for Server team development effort in ASP.Net using C#. Also responsible for scheduling, resource management, and interfacing with Client team.</li> </ul> </li> </ul>

- Responsible for managing and mentoring new hires
- **Lead Software Engineer**
  - Lead Engineer for a Navy Sponsored Web Based Data Aggregation Project consisting of six Government and Contractor Engineers. Responsible for tasking engineering team, monitoring progress, and overseeing new features. Also, meeting with client, and helping them develop requirements for project.
  - Responsible for briefing VIPs, including US Navy Admirals.
  - Member of Cyber-Warfare Strategy Planning meeting, which was comprised of senior leadership and outstanding engineers.
- **Software Engineer**
  - Primary Software Engineer for two projects starting with developing a demo from a concept, lead engineer for lifetime of the development cycle, including transition period once project was finished and delivered
  - Developed Embedded Application running on Windows Mobile in embedded Visual Basic and embedded C++ deployed and used by USN and US Coast Guard.

SERVICE	2022	ICSE Student Volunteer Co-Chair
	2021	CRE-E Outstanding Undergraduate Researcher Award Committee Co-Chair
	2020	CRE-E Outstanding Undergraduate Researcher Award Committee Co-Chair
	2020	Computing Research Association - Education Committee Member
	2020	International Conference on Automated Software Engineering Program Committee
	2019	Transactions on Software Engineering Journal Reviewer
	2019	Empirical Software Engineering Journal Reviewer
	2018	Transactions on Software Engineering Journal Reviewer
	2018	Empirical Software Engineering Journal Reviewer
	2018	2nd Workshop on Innovative Software Engineering Education (ISEE) Program Committee
	2018	SIGCSE Reviewer
	2018	Member of Program Committee, ISSTA 2018 Tool Demonstrations
	2018	Member of Program Committee, Artifact Evaluation Committee for ISSTA 2018 Artifacts
	2017, 2018	Member of Program Committee, Mining Software Repositories Challenge
	2017	Journal of Systems and Software
	2017	ACM Transactions on Software Engineering and Methodology (TOSEM)
	2017, 2016 and 2015	Video Chair at ACM's SPLASH (OOPSLA) conference
	2016	Student Volunteer at ACM/IEEE ICSE conference
	2013	Student Volunteer at ACM's SPLASH (OOPSLA) conference

STUDENT MENTORING	<b>Sophia Kolak</b> (REU - Summer 2019 - REUSE) Understanding Robotics Testing
	<b>Lilly Mast</b> (REU - Summer 2015 - Oregon State University) Code Completion Project
	<b>Eli Rademacher</b> (REU - Summer 2015 - Oregon State University) Code Completion Project
	<b>Sean McDonald</b> (REU - Summer 2014 - Oregon State University) TDD Visualization Project
	<b>Hugh McDonald</b> (REU - Summer 2014 - Oregon State University) TDD Visualization

Project

**Nicolas Nelson** (REU - Summer 2014 - Oregon State University) TDD Visualization  
Project

**Lucas David** (REU - Summer 2012 - CalPoly) Improving WebIDE

**Vanessa Forney** (REU - Summer 2012 - CalPoly) Improving WebIDE