

Michael Hilton

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| CONTACT INFORMATION | Institute for Software Research School of Computer Science Carnegie Mellon University | +1(412)268-7671 mhilton@cmu.edu http://www.cs.cmu.edu/~mhilton |
| 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 | Carnegie Mellon University , Pittsburgh, PA USA 2020 - Present Associate Teaching Professor, Faculty Coordinator, Undergraduate Teaching 2017 - 2020 Assistant Teaching Professor Institute for Software Research (ISR) School of Computer Science (SCS) | |
| EDUCATION | Oregon State University , Corvallis, OR USA Ph.D., Computer Science , June 2017 <ul style="list-style-type: none">• Advisor: Dr. Danny Dig• Area of Study: Software Engineering• Thesis Topic: <i>Understanding and Improving Agile Development Practices</i> California Polytechnic State University , San Luis Obispo, CA USA M.S., Computer Science , March 2013 <ul style="list-style-type: none">• Advisor: Dr. David Janzen• Area of Study: Software Engineering• Thesis Topic: <i>Improving WebIDE through delightful design and gamification</i> San Diego State University , San Diego, CA USA B.S., Computer Science , May 2002, <i>Cum Laude</i> Grossmont Community College , El Cajon, CA USA A.S., May 1999 | |
| AWARDS AND HONORS | Spira Excellence in Teaching Award 2021 In recognition of major accomplishments and outstanding qualities and strengths in teaching and for excellence in the classroom. Wimmer Faculty Fellows 2020-21 Eberly Center for Teaching Excellence and Educational Innovation Facebook TAV award - 2019 Search-based inducement and repair of latent test flakiness Philip McMin (University of Sheffield), Gregory M. Kapfhammer (Allegheny College), Michael Hilton (Carnegie Mellon University), and Owain Parry (University of Sheffield) presented to an an SCS faculty member in recognition of major accomplishments and outstanding qualities and strengths in teaching and for excellence in the classroom. ACM SIGSOFT Distinguished Paper Award Awarded to the top papers at a conference. Received at FSE 2017. ACM SIGSOFT Distinguished Paper Award Awarded to the top papers at a conference. Received at FSE 2016. J.L. Moore Doctoral Fellowship Awarded to Cal Poly CSC graduates who pursue Doctoral Studies in Computer Science. Received 2013,2014,2015 | |

TEACHING
EXPERIENCE

Carnegie Mellon University, Pittsburgh, PA USA

- Spring '22 - 15-890 Computer Science Pedagogy
- Spring '22 - 17-356 Software Engineering for Startups
- Spring '22 - 17-413 Software Engineering Practicum
- Spring '22 - 17-950 Crafting Software
- Fall '21 - 17-313 Foundations of Software Engineering
- Fall '21 - 17-625 Design Patterns & API Design
- Spring '21 - 17-356 Software Engineering for Startups
- Spring '21 - 17-450/17-950 Crafting Software
- Fall '20 - 17-313 Foundations of Software Engineering
- 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. Afzal, A., C. L. Goues, M. Hilton, and C. S. Timperley. 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>.
2. Durieux, T., C. L. Goues, M. Hilton, and R. Abreu. 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>.
3. Kolak, S., A. Afzal, C. L. Goues, M. Hilton, and C. S. Timperley. 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>.
4. Nguyen, H. A., T. N. Nguyen, D. Dig, S. Nguyen, H. Tran, and M. Hilton. 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>.

5. Sankaranarayanan, S., X. Wang, C. Dashti, M. An, C. Ngoh, M. Hilton, M. Sakr, and C. P. Rosé. 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.
6. Widder, D. G., M. Hilton, C. Kästner, and B. Vasilescu. 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>.
7. Bell, J., O. Legunsen, M. Hilton, L. Eloussi, T. Yung, and D. Marinov. 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>.
8. Hilton, M. and A. Begel. 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>.
9. Hilton, M., J. Bell, and D. Marinov. 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>.
10. Widder, D. G., M. Hilton, C. Kästner, and B. Vasilescu. 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>.
11. Hilton, M., N. Nelson, T. Tunnell, D. Marinov, and D. Dig. 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](https://doi.org/10.1145/3106237.3106270). http://www.cs.cmu.edu/~mhilton/docs/Hilton_CI_Tradeoffs.pdf.
12. Omar, C., I. Voysey, M. Hilton, J. Aldrich, and M. A. Hammer. 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>.
13. Hilton, M., N. Nelson, H. McDonald, S. McDonald, R. Metoyer, and D. Dig. 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>.
14. Hilton, M., T. Tunnell, K. Huang, D. Marinov, and D. Dig. 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>.
15. Nguyen, A. T., M. Hilton, M. Codoban, H. A. Nguyen, L. Mast, E. Rademacher, T. N. Nguyen, and D. Dig. 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.
16. Hilton, M., A. Christi, D. Dig, M. Moskal, S. Burckhardt, and N. Tillmann. Refactoring local to cloud data types for mobile apps. In: *Proceedings of the 1st International Conference on Mobile Software Engineering and Systems. MOBILESoft 2014.*
<http://cope.eecs.oregonstate.edu/papers/RefactorToCloud.pdf>.
 17. Janzen, D. S., J. Clements, and M. Hilton. 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>.
 18. Hilton, M. and D. S. Janzen. 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>.

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

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