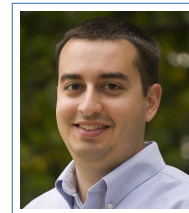


# Michael O. Lam

## Curriculum Vitae

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### Education

- 2007–2014 **Ph.D. Computer Science**, *University of Maryland*, College Park, MD.  
2007–2010 **M.S. Computer Science**, *University of Maryland*, College Park, MD.  
2004–2007 **B.S. Computer Science**, *James Madison University*, Harrisonburg, VA.  
Minor in Mathematics

### Experience

- 2014–present **Assistant Professor**, *James Madison University*, Harrisonburg, VA.  
Teach courses on systems fundamentals, parallel and distributed systems, compiler systems, and programming languages. Advise undergraduate research projects in system tools, compiler systems, high-performance computing, and software engineering. Serve on a variety of department- and college-level committees and service projects.
- 2011, 2016–present **Summer Research Scholar**, *Lawrence Livermore National Lab*, Livermore, CA.  
Work with multiple teams to develop systems tools for floating-point arithmetic analysis in the context of high-performance computing. Advise undergraduate student interns.
- 2007–2014 **Graduate Research Assistant and Postdoctoral Researcher**, *University of Maryland*, College Park, MD.  
Worked with Dr. Jeff Hollingsworth on a software system for automated floating-point precision level recommendations using binary instrumentation and runtime analysis. Also developed a tool for detecting and reporting floating-point cancellation.
- 2006 **Undergraduate Research Assistant**, *DePaul University*, Chicago, IL.  
Worked with Dr. Daniela Raicu on an open-source framework for content-based medical image retrieval.

### Awards and Honors

- Outstanding Junior Faculty Award, College of Integrated Science and Engineering, James Madison University, 2019.
- Invited panelist, “Facilitating the Adoption of Correctness Tools in HPC Applications” at the Second International Workshop on Software Correctness for HPC Applications (co-located with SC’18), 2018.
- Davies-Yanskies Award, Computer Science Department, James Madison University, 2018, \$1,000
- Provost’s Research and Development Grant, James Madison University, 2017–2018, \$4,840
- Faculty Development Grant, College of Integrated Science and Engineering, James Madison University, 2017–2018, \$4,000
- Provost Research Award, James Madison University, 2015–2016, \$4,000
- Early Career Workshop, The International Conference for High Performance Computing, Networking, Storage, and Analysis (SC’15), Nov. 2015
- Dissertation Research Showcase, The International Conference for High Performance Computing, Networking, Storage, and Analysis (SC’13), Nov. 2013

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## Courses Taught

- **CS240 - Data Structures and Algorithms** (Fa14, Fa15)
- **CS261 - Computer Systems I** (Fa16, Fa17, Fa18)  
Designed or re-designed all course material in 2016, much of which is now also used by other faculty who teach the course.
- **CS280 - Competitive Programming** (Fa15, Fa16, Sp18, Sp19)  
This course prepares students to participate in the ACM ICPC programming competition.
- **CS430 - Programming Languages** (Sp15, Sp18, Sp19)
- **CS432 - Compilers** (Fa16, Fa17, Fa18)  
Successfully proposed the creation of this new catalog course, designing the course itself and all material using applied backwards design theory. The course is now a permanent advanced elective in our systems curriculum.
- **CS470 - Parallel and Distributed Systems** (Sp16, Sp17, Sp18, Sp19)  
Designed and implemented this course as an advanced elective in our systems curriculum.
- **CS480 - Special Topics: Compilers** (Fa15)
- **CS480 - Special Topics: Large-scale Visualization** (Sp15)  
Co-taught this cross-listed CS/Math course on visualization with a faculty member from the math department; the course was sponsored by the JMU Institute for Visual Studies.
- **CS630 - Compilers (Graduate)** (Sp15, Sp16, Sp17)

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## Advising Experience

- Spring 2020: Charles Hines and Kevin Kelly  
Title TBD (Honors theses, advisor)
- Spring 2019: Rebecca Wild  
"Precision Analysis of a Chaotic System" (Honors thesis, advisor)
- Spring 2018: Zamua Nasrawt  
"Less Java, More Learning: Language Design for Introductory Programming" (Honors thesis, advisor)
- 2016–2017: Cory Walker  
"Mapping the Bitcoin Network" (Master's thesis, committee member)
- Spring 2016: Justin Magnotti  
"Automated Exam Generation and Analysis" (Independent study, advisor)
- Spring 2016: Christian Toms  
"Value Numbering" (Independent study, advisor)
- 2015–2016: Steven Young  
"A Comparison of Algorithms and Heuristics for Solving the  $O^1I^nD^1$  Shortest Route Problems" (Honors thesis, committee member)
- 2015–2016: LaTia Hutchinson  
"Live Musical Steganography" (Master's thesis, committee member)

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## Service

- Fall '17 – present: Advisor for Upsilon Pi Epsilon honor society (JMU, dept.)
- Fall '17 – present: Co-advisor for Unix Users Group club (JMU, university)
- Fall '17 – present: Advisor for PlayMU gaming club (JMU, university)
- Fall '15 – present: Co-advisor for ACM Competitive Programming club (JMU, dept.)
- Fall '14 – present: CS department lab systems committee member (JMU, dept.)
- Spring '18 – present (until Spring '19): Web Chair for Principles and Practice of Parallel Programming 2019 (PPoPP'19) conference in Washington, DC (ACM SIGPLAN, field)

- Fall '17 – present (until Spring '19): CISE faculty council member and secretary (JMU, college)
- Spring '18: CS IT administrator search committee member (JMU, dept.)
- Fall '15 – Fall '16, Fall '17 – present (until Spring '18): CS department PAC administrative and appeals subcommittee member (JMU, dept.)
- Fall '16 – Spring '17: CS department search committee member (JMU, dept.)
- Fall '16, '17, and '18: Volunteer mentor for mentor/protegeé program (Supercomputing, field)  
Mentored students attending Supercomputing, answering questions about research, teaching, and career options in HPC.
- Spring '15 – Spring '17: Systems acquisition (JMU, dept./college)  
Coordinated the purchase, installation, and maintenance of a 16-node high-performance computing cluster that is used for both research and teaching.
- Spring '15: Technical program committee member (Cluster'15, field)  
Reviewed eight papers for the Architecture systems track and participated in online committee discussions supporting acceptance decisions.
- Fall '14 – Fall '15: Systems track curriculum re-design committee (JMU, dept.)  
Helped significantly with the development of a new senior-level parallel and distributed systems class with an emphasis on high-performance computing, as well as a new senior-level compilers class with an emphasis on systems and software engineering.
- Fall '10 – Spring '13: Representative, Graduate Student Government (UMD)  
Represented Computer Science graduate students in assembly meetings. Served one year on the Student Affairs committee and one year on the Budget and Finance committee.

## Software Releases

- **ADAPT** - Automatic differentiation tool for floating-point precision tuning  
(v1.0 to be released Q1 2019)  
URL: [github.com/11n1/adapt-fp](https://github.com/11n1/adapt-fp) (to appear)
- **CRAFT** - Floating-point runtime analysis library  
(v1.0 released 2014, v1.1 released 2016, and v1.2 released 2018)  
URL: [github.com/crafthpc/craft](https://github.com/crafthpc/craft)
- **C Test Framework** for academic courses (released July 2018)  
URL: [github.com/JMU-CS/c-test-framework](https://github.com/JMU-CS/c-test-framework)
- **SHVAL** - Floating-point shadow value analysis library (released April 2017)  
URL: [github.com/lam2mo/shval](https://github.com/lam2mo/shval)

## Selected Publications

### Journal Articles

- [1] Zamua O. Nasrawt and Michael O. Lam. Less-Java, More Learning: Language Design for Introductory Programming. *Journal of Computing Sciences in Colleges (to appear)*, 2019.
- [2] Michael O. Lam, Noah S. McClelland, Matthew R. Petty, and John J B Webb. Computing bases of modular forms using the graded algebra structure. *Monatshefte für Mathematik*, 3 2018.
- [3] Joseph K. Arbogast, Isaac B. Sumner, and Michael O. Lam. Parallelizing Shamir's Secret Sharing Algorithm. *Journal of Computing Sciences in Colleges*, 33(3):12–18, 2018.
- [4] Quincy E. Mast, Zamua O. Nasrawt, Garrett L. Folks, and Michael O. Lam. Traveling Salesman: A Heuristic Scaling Analysis. *Journal of Computing Sciences in Colleges*, 33(3):19–25, 2018.
- [5] Patricia D. Soriano, Kevin H. Amrein, Sam P. Carswell, and Michael O. Lam. Analysis of

- Parallel Implementations of Centrality Algorithms. *Journal of Computing Sciences in Colleges*, 33(3):31–38, 2018.
- [6] R. Medhat, M.O. Lam, B.L. Rountree, B. Bonakdarpour, and S. Fischmeister. Managing the performance/error tradeoff of floating-point intensive applications. *ACM Transactions on Embedded Computing Systems*, 16(5s), 2017.
- [7] Michael O. Lam and J. K. Hollingsworth. Fine-Grained Floating-Point Precision Analysis. *International Journal of High Performance Computing Applications*, page 1094342016652462, 6 2016.
- [8] Michael O. Lam, Jeffrey K. Hollingsworth, and G.W. Stewart. Dynamic Floating-Point Cancellation Detection. *Parallel Computing*, 39(3):146–155, 3 2013.

#### Conference or Peer-Reviewed Workshop Papers

- [9] Dee A. B. Weikle, Michael O. Lam, and Michael S. Kirkpatrick. Automating Systems Course Unit and Integration Testing. In *Proceedings of the 50th ACM Technical Symposium on Computer Science Education (SIGCSE'19, to appear)*, 2019.
- [10] Harshitha Menon, Michael O Lam, Daniel Osei-kuffuor, Markus Schordan, Scott Lloyd, Kathryn Mohror, and Jeffrey Hittinger. ADAPT : Algorithmic Differentiation Applied to Floating-Point Precision Tuning. In *Proceedings of the International Conference for High Performance Computing, Networking, Storage, and Analysis (SC'18)*, pages 48:1–48:13, Dallas, Texas, 2018. IEEE Press.
- [11] Ramy Medhat, Michael O. Lam, Barry L. Rountree, Borzoo Bonakdarpour, and Sebastian Fischmeister. Managing the Performance/Error Tradeoff of Floating-point Intensive Applications. In *Proceedings of the International Conference on Embedded Software (EMSOFT'17)*. ACM, 2017.
- [12] Shane Fogerty, Siddhartha Bishnu, Yuliana Zamora, Laura Monroe, Steve Poole, Michael Lam, Joe Schoonover, and Robert Robey. Thoughtful Precision in Mini-Apps. In *2017 IEEE International Conference on Cluster Computing (CLUSTER)*, pages 858–865, Honolulu, HI, 9 2017. IEEE.
- [13] Michael O. Lam and Barry L. Rountree. Floating-Point Shadow Value Analysis. In *Proceedings of the 5th Workshop on Extreme-Scale Programming Tools, ESPT '16*, pages 18–25, Piscataway, NJ, USA, 2016. IEEE Press.
- [14] Michael O. Lam, Jeffrey K. Hollingsworth, Bronis R. de Supinski, and Matthew P. Legendre. Automatically Adapting Programs for Mixed-Precision Floating-Point Computation. In *Proceedings of the 27th International ACM Conference on Supercomputing (ICS '13)*, page 369, New York, New York, USA, 6 2013. ACM Press.
- [15] Michael O. Lam, Jeffrey K. Hollingsworth, and G.W. Stewart. Dynamic Floating-Point Cancellation Detection. In *WHIST '11*, 2011.

#### Technical Reports

- [16] Michael O Lam. Summer Report: Tool Integration for Variable-Precision Computing. Technical report, Lawrence Livermore National Laboratory, 2018.
- [17] Michael O Lam. Summer Report: Software Tools for Variable-Precision Computing. Technical report, Lawrence Livermore National Laboratory, 2017.

#### Invited Articles

- [18] Michael O. Lam. Video games. *AccessScience*, 2016.