Katherine Hough

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Education

Doctor of Philosophy in Computer Science — **September 2020 – December 2024**

Northeastern University — *Boston, MA*

Advisor: Jonathan Bell

Thesis: Leveraging Dynamic Data Relationships to Amplify Software Tests

Master of Science in Computer Science — **August 2019 – May 2020**

George Mason University — *Fairfax, VA*

GPA: 4.0; summa cum laude

Bachelor of Science in Computer Science — **August 2015 – May 2019**

George Mason University — *Fairfax, VA*

GPA: 4.0; summa cum laude

Work Experience

Research Intern — **May 2024 – August 2024**

Microsoft Research — *Redmond, WA*

Worked in the the Research in Software Engineering group.

Graduate Research Assistant — **September 2020 – Present**

Northeastern University — *Boston, MA*

Researched software testing and dynamic analysis for the Java Virtual Machine.

Graduate Teaching Assistant — **January 2023 – April 2023**

Northeastern University — *Boston, MA*

Assisted with the course Advanced Software Engineering (CS 4973/7580).

Graduate Research Assistant — **May 2019 - August 2020**

George Mason University — *Fairfax, VA*

Developed an approach for repurposing functional tests to detect injection vulnerabilities using dynamic taint tracking.

Maintained the Phosphor dynamic taint tracking system.

Naval Research Enterprise Internship Program Intern — **May 2018 – August 2018**

Department of the Navy, Naval Surface Warfare Center Carderock Division — *West Bethesda, MD*

Worked on a development team building and maintaining ship design software tools.

Focused on tasks related to debugging and unit testing C++ and Fortran code.

Naval Research Enterprise Internship Program Intern — **May 2016 – July 2016**

Department of the Navy, Naval Surface Warfare Center Carderock Division — *West Bethesda, MD*

Developed a Java program to assist in the management of flight deck thermal exposure during F-35B operations on large deck

amphibious assault ships.

Awards and Honors

Distinguished Graduate Academic Achievement Award — **Spring 2020**

Awarded by George Mason University Department of Computer Science based on academic achievement.

Outstanding Undergraduate Student Award — **Spring 2019**

Awarded by George Mason University Department of Computer Science to faculty-selected students.

Distinguished Undergraduate Academic Achievement Award — **Spring 2019**

Awarded by George Mason University Department of Computer Science based on academic achievement.

Dean's List — **Spring 2016 – Spring 2020**

Awarded by George Mason University for academic achievement.

Mason Excellence Scholarship — **Fall 2014 – Spring 2019**

Awarded based on academic merit.

Boeing Scholarship — **Fall 2016 – Spring 2017**

Awarded in recognition of academic achievement and leadership.

Publications

1. **In submission.** Hough, K., and Bell, J. Dynamic taint tracking for modern java virtual machines. *Proc. ACM Softw. Eng. 2*, FSE (2025). https://katherine-hough.github.io/files/galette_preprint.pdf.

2. Lincroft, G., Cho, M., Hough, K., Bazzaz, M., and Bell, J. Thirty-three years of mathematicians and software engineers: A case study of domain expertise and participation in proof assistant ecosystems. In *Proceedings of the 21st International Conference on Mining Software Repositories* (New York, NY, USA, 2024), MSR '24, Association for Computing Machinery. https://katherine-hough.github.io/files/itp.pdf.

3. Hough, K., and Bell, J. Crossover in parametric fuzzing. In *Proceedings of the ACM/IEEE 46th International Conference on Software Engineering* (New York, NY, USA, 2024), ICSE '24, Association for Computing Machinery. https://katherine-hough.github.io/files/zeugma.pdf.

4. Hough, K., and Bell, J. A practical approach for dynamic taint tracking with control-flow relationships. *ACM Trans. Softw. Eng. Methodol. 31*, 2 (Dec. 2021). https://katherine-hough.github.io/files/conflux.pdf.

5. Hough, K., Welearegai, G., Hammer, C., and Bell, J. Revealing injection vulnerabilities by leveraging existing tests. In *Proceedings of the ACM/IEEE 42nd International Conference on Software Engineering* (New York, NY, USA, 2020), ICSE '20, Association for Computing Machinery, pp. 284–296. https://katherine-hough.github.io/files/rivulet.pdf.