William T. Hallahan

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Research Interests

Symbolic execution, program synthesis, networks

Education

Yale University   **New Haven, CT**
Computer Science, Prospective Ph.D.   *2015–2021 (Anticipated)*
Advisor: Ruzica Piskac

College of the Holy Cross   **Worcester, MA**
Bachelor of Arts in Mathematics, Computer Science (Double Major)   *2011–2015*
Thesis: Stability of the coefficients in the Kronecker product of a hook and a rectangle
Thesis Advisor: Cristina Ballantine

Research

Publications..

K. Morton, W. Hallahan, E. Shum, R. Piskac, M. Santolucito. **Grammar Filtering For Syntax-Guided Synthesis.** *AAAI*, 2020.

W. Hallahan, A. Xue, R. Piskac. **G2Q: Haskell Constraint Solving.** *Haskell Symposium*, 2019.

W. Hallahan, A. Xue, M. Bland, R. Jhala, R. Piskac. **Lazy Counterfactual Symbolic Execution.** *PLDI*, 2019.

W. Hallahan, M. Santolucito, R. Piskac. **Live Programming by Example.** *CHI Demonstrations*, 2019.

J. Liu, W. Hallahan, C. Schlesinger, M. Sharif, J. Lee, R. Soulé, H. Wang, C. Cașcaval, N. McKeown, N. Foster. **p4v: Practical Verification for Programmable Data Planes.** *SIGCOMM*, 2018.

W. Hallahan, E. Zhai, R. Piskac. **Automated Analysis and Repair By Example for Firewalls.** *FMCAD*, 2017.

C. Ballantine, W. Hallahan. **Stability of coefficients in the Kronecker product of a hook and a rectangle.** *Journal of Physics A: Mathematical and Theoretical, Vol. 49 (5)*, 2015.

Work Experience..

Software Engineering and Research Intern   **Portland, OR**
Galois   *June 2018 - August 2018*

Software Engineering and Research Intern   **Santa Clara, CA**
Barefoot Networks   *June 2017 - August 2017*

Talks..

Lazy Symbolic Execution: Writing, Debugging, and Repairing Programs
Cornell University   *July 2020*

Grammar Filtering For Syntax-Guided Synthesis
AAAI   *February 2020*

Data-driven Specification Synthesis for Modular Verification
Programming Languages Day, IBM T.J. Watson Research Center   *December 2019*

G2Q: Haskell Constraint Solving
Haskell Symposium   *August 2019*

Lazy Counterfactual Symbolic Execution
PLDI   *July 2019*

Lazy Symbolic Execution: Counterfactual Examples and Haskell Constraint Solving
Microsoft Research Cambridge   *June 2019*

Lazy Symbolic Execution: Counterfactual Examples and Haskell Constraint Solving
Imperial College London   *June 2019*

Lazy Symbolic Execution: Counterfactual Examples and Haskell Constraint Solving
DiffBlue   *June 2019*

Lazy Counterfactual Symbolic Execution
IBM Programming Languages Day, IBM T.J. Watson Research Center   *December 2018*

Automated Analysis and Repair By Example for Firewalls
FMCAD   *October 2017*

Automated Firewall Repair via Example-Based Synthesis
IBM Programming Languages Day, IBM T.J. Watson Research Center   *December 2016*

Stability of the coefficients in the Kronecker product of a hook and a rectangle
College of the Holy Cross   *April 2015*

Poster Presentations...

Building a Symbolic Execution Engine for Haskell
FMCAD   *October 2017*

Automated Firewall Repair via Example-Based Synthesis
FMCAD   *October 2016*

On the Kronecker Product of a Hook and a Box
JMM   *January 2015*

Teaching

Advising Student Projects...

Live Programming Interface   **Yale University**
Griffin Solot-Kehl   *Spring 2019*

Synthesizing SDNs as Functional Reactive Programs   **Yale University**
Vivek Gopalan   *Summer 2018*

Teaching Assistant..

Software Engineering   **Yale University**
Taught by Ruzica Piskac   *Spring 2019*

Software Analysis and Verification   **Yale University**
Taught by Ruzica Piskac   *Fall 2018*

Software Engineering   **Yale University**
Taught by Ruzica Piskac   *Spring 2018*

Software Analysis and Verification   **Yale University**
Taught by Ruzica Piskac   *Fall 2017*

Principles of Operating Systems   **Yale University**
Taught by Avi Silberschatz   *Spring 2017*

Introduction to Systems Programming & Computer Organization   **Yale University**
Taught by Stanley C. Eisenstat   *Fall 2016*

Led Tutorial Session...

Algebraic Structures   **College of the Holy Cross**
Taught by Cristina Ballantine   *Spring 2015*

Service

Artifact Evaluation Committee
CAV   *2019*

Technical Skills

Haskell, Python, SMT-LIB, C, and C++