William T. Hallahan

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Research Interests

Program synthesis, synthesis by example, verification

Education

Yale University — **New Haven, CT**
Computer Science, Prospective Ph.D. — *2015–2020 (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

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

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. Caşcaval, 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 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++