

# Pieter Hooimeijer

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## Education

- University of Virginia** 2006 – Present  
Ph.D. Candidate, Computer Science (current)  
Adviser: Westley R. Weimer  
Dissertation: *Decision Procedures for String Constraints*
- M.S. Computer Science (May 2008)  
Adviser: Westley R. Weimer  
Thesis: *Generating String Inputs using Constrained Symbolic Execution*
- Colgate University** 2002 – 2006  
B.A. Computer Science (May 2006)  
*Magna Cum Laude*, Highest Honors in Computer Science  
Alumni Memorial Scholarship  
Outstanding Contribution to the Computer Science Community  
Edward P. Felt Memorial Prize in Computer Science

## Publications

- Pieter Hooimeijer, Westley Weimer: *STRSOLVE: Solving String Constraints Lazily*. Journal of Automated Software Engineering, *under submission*.
- Margus Veanes, Pieter Hooimeijer, Benjamin Livshits, David Molnar, Nikolaj Bjørner: *Symbolic Finite State Transducers: Algorithms and Applications*. Principles of Programming Languages (POPL 2012), *to appear*. Acceptance: 21%.
- Adam Kiezun, Vijay Ganesh, Shay Artzi, Philip J. Guo, Pieter Hooimeijer, Michael D. Ernst: *HAMPI: A Solver for Word Equations over Strings, Regular Expressions and Context-Free Grammars*. Transactions on Software Engineering and Methodology (TOSEM), *to appear*.
- Pieter Hooimeijer, Benjamin Livshits, David Molnar, Prateek Saxena, Margus Veanes: *Fast and Precise Sanitizer Analysis with BEK*. USENIX Security Symposium (USENIX Security '11), pp. 1–16. Acceptance: 17%.
- Pieter Hooimeijer, Margus Veanes: *An Evaluation of Automata Algorithms for String Analysis*. Verification, Model Checking, and Abstract Interpretation (VMCAI '11), pp. 248–262. Acceptance: 34%.
- Pieter Hooimeijer, Westley Weimer: *Solving String Constraints Lazily*. Automated Software Engineering (ASE '10), pp. 377–386. Acceptance: 17%.
- Tamim Sookoor, Timothy Hnat, Pieter Hooimeijer, Westley Weimer, Kamin Whitehouse: *Macrodebugging: Global Views of Distributed Program Execution*. Embedded Networked Sensor Systems (SenSys '09), pp. 141–154. Acceptance: 18%.
- Adam Kiezun, Vijay Ganesh, Philip J. Guo, Pieter Hooimeijer, Michael D. Ernst: *HAMPI: A Solver for String Constraints*. Software Testing and Analysis (ISSTA '09), pp. 105–116. Acceptance: 27%.  
**ACM Distinguished Paper Award.**
- Pieter Hooimeijer, Westley Weimer: *A Decision Procedure for Subset Constraints over Regular Languages*. Programming Language Design and Implementation (PLDI '09), pp. 188–198. Acceptance: 21%.
- Timothy Hnat, Tamim Sookoor, Pieter Hooimeijer, Westley Weimer, Kamin Whitehouse: *MacroLab: A Vector-based Macroprogramming Framework for Cyber-Physical Systems*. Embedded Networked Sensor Systems (SenSys '08), pp. 225–238. Acceptance: 16%.

Adrienne Felt, Pieter Hooimeijer, David Evans, Westley Weimer: *Talking to Strangers Without Taking Their Candy: Isolating Proxied Content*. Workshop on Social Network Systems (SocialNets '08), pp. 25–30. Acceptance: 50%.

Pieter Hooimeijer, Westley Weimer: *Modeling Bug Report Quality*. Automated Software Engineering (ASE '07), pp. 34–43. Acceptance: 12%.

## Work Experience

**Microsoft Research**, Redmond, WA Summer 2011  
Mentor: Margus Veanes.

Developed BEK, a domain-specific programming language for low-level string manipulation. BEK allows for extensive static analysis (e.g., to prove security properties) and optimized translation back to general-purpose programming languages. I presented this work at POPL 2012.

**Microsoft Research**, Redmond, WA Summer 2010  
Mentor: Margus Veanes.

Proposed an apples-to-apples performance comparison of data structures and algorithms to handle set operations over large (16–21 bit) character sets. Bootstrapped BEK, a research project that spans security and theory, and focuses on low-level string-manipulation. I presented this work at USENIX Security 2011 and VMCAI 2011.

**Microsoft Research India**, Bangalore, India Summer 2009  
Mentor: Venkatesh-Prasad Ranganath.

Investigated statistical models, based on frequent itemset mining, to automatically infer locking policies (and detect possible race conditions) based on execution traces of .NET code.

**Intel Corporation**, Santa Clara, CA Summer 2008  
Mentor: Peng Tu.

Investigated the detection of software pipeline parallelism in big outer loops to enable staggered parallel execution in the context of the Intel C Compiler.

**University of Virginia**, Charlottesville, VA Fall 2006 – Spring 2007  
Teaching Assistant  
CS451 – Parallel Computing (Fall)  
CS415 – Programming Languages (Spring)

## Projects

BEK (contributor)—Programming language runtime, and proof engine. C#; F#; Z3 SMT solver.  
<http://research.microsoft.com/en-us/projects/bek/>

DPRLE (owner)—String constraint solver. OCaml (code), Coq (core correctness proof).  
<http://www.cs.virginia.edu/~ph4u/dprle/>

Hampi (contributor)—String constraint solver. Java; some JNI.  
<http://code.google.com/p/hampi/>

MERD (owner)—A small framework for running experiments. Python, using SQLAlchemy.  
<http://code.google.com/p/merd/>

STRSOLVE (owner)—String constraint solver. C++, using Boost libraries.