Yuting Wang

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I am a postdoctoral researcher at Yale University, working with Professor Zhong Shao.

Education

- *University of Minnesota*, Minneapolis, MN, USA
  Ph.D. in Computer Science and Engineering, September 2011 - December 2016
  Thesis: *A Higher-Order Abstract Syntax Approach to the Verified Compilation of Functional Programs*
  Advisor: Gopalan Nadathur
- *University of Connecticut*, Storrs, CT, USA
  M.S. in Computer Science and Engineering, August 2011
  Thesis: *AMIBE: an Imperative Programming Language with First Class Continuations*
  Advisor: Laurent Michel
- *Shanghai Jiao Tong University*, Shanghai, China
  M.S. in Power System and its Automation, March 2009
- *Shanghai Jiao Tong University*, Shanghai, China
  B.S. in Electric Engineering and Automation, June 2006

Research Interests

My research interests are broadly in the area of formal verification of software systems. Within this context, I am interested in developing specification and reasoning formalisms, in constructing systems that implement these formalisms and in applying the formalisms using the systems that implement them to verify software artifacts.

Fully Refereed Publications

- Yuting Wang and Gopalan Nadathur. *A Higher-Order Abstract Syntax Approach to Verified Transformations on Functional Programs*. Proceedings of the 25th European Symposium on Programming (ESOP), pages 752-779, 2016.
- Yuting Wang and Kaustuv Chaudhuri. *A Proof-Theoretic Characterization of Independence in Type Theory*. Proceedings of the 13th International Conference on Typed Lambda Calculi and Applications (TLCA), pages 332-346, 2015.
- David Baelde, Kaustuv Chaudhuri, Andrew Gacek, Dale Miller, Gopalan Nadathur, Alwen Tiu, and Yuting Wang. *Abella: A System for Reasoning about Relational Specifications*. Journal of Formalized Reasoning, 7(2), 2014.
- Yuting Wang, Kaustuv Chaudhuri, Andrew Gacek, and Gopalan Nadathur. *Reasoning about Higher-Order Relational Specifications*. Proceedings of the 15th ACM SIGPLAN Symposium on Principles and Practice of Declarative Programming (PPDP), pages 157-168, 2013.

- Yuting Wang and Gopalan Nadathur. *Towards Extracting Explicit Proofs from Totality Checking in Twelf*. Proceedings of the 8th ACM SIGPLAN International Workshop on Logical Frameworks and Metalanguages: Theory and Practice (LFMTP), pages 55-66, 2013.
- Che Guan, Peter Luh, Laurent Michel, Yuting Wang, and Peter Friedland. *Very Short-Term Load Forecasting: Wavelet Neural Networks with Data Pre-Filtering*. IEEE Transactions on Power Systems, 28(1):30-41, 2013.

Work Experience

- Post doctoral associate on the CertiKOS project for building a verified OS kernel, Yale University, 2016 - Present. Work supervised by Zhong Shao.
- Research assistant on an NSF funded project entitled "Reasoning about Specifications of Computations", University of Minnesota, 2011 - 2016. Work supervised by Gopalan Nadathur.
- Research internship, INRIA Saclay, Palaiseau, France, Summer 2014. Work supervised by Kaustuv Chaudhuri.
- Research internship, INRIA Saclay, Palaiseau, France, Summer 2012. Work supervised by Kaustuv Chaudhuri and Dale Miller.
- Research assistant on the Short-Term Load Forecasting project, University of Connecticut, 2009 - 2011. Work supervised by Laurent Michel and Peter Luh.

Teaching Experience

- Teaching assistant for CSCI-4011: Formal Languages and Automata Theory, University of Minnesota, Fall 2015. Lecturer: Gopalan Nadathur.

Software Systems

- *Abella*: `http://abella-prover.org`

  An interactive theorem-prover that is noteworthy for its support of higher-order abstract syntax and for the two-level logic approach to reasoning about formal specifications. This system represents joint work with other researchers at the University of Minnesota and at INRIA, Saclay, France. My contributions to the system were to build a complete treatment of an expressive specification logic (called the logic of higher-order hereditary Harrop formulas) and to co-develop a methodology for using this enhancement in complex reasoning tasks.
- *AMIBE*: `http://digitalcommons.uconn.edu/gs_theses/142/`

  AMIBE is an imperative programming language that supports first class continuations that I co-designed with Laurent Michel. As part of this work, I implemented a compiler for AMIBE in C++. This system demonstrates how to develop efficient *constraint programming* languages by exploiting rich optimizations provided by modern compiler infrastructures such as LLVM.
- *VSTLF*: `https://github.com/ldmbouge/vstlf`

Very Short Term Load Forecasting (VSTLF) is a system for forecasting electric power load in short terms (from minutes to hours). I was the main programmer for the VSTLF project from 2009 to 2011. VSTLF is written in Java.

Research Presentations

- A Framework for Verified Compilation of Functional Programs. Seminar in Prof. Zhong Shao's group (invited talk). Yale University, USA, March 2016.
- A Proof-Theoretic Characterization of Independence in Type Theory. The 13th International Conference on Typed Lambda Calculi and Applications. University of Warsaw, Poland, July 2015.
- Verified Transformations of Functional Programs. Midwest Verification Day 2014. University of Missouri, USA, October 2014.
- Verified Functional Program Transformations Using Higher-Order Abstract Syntax. Parsifal Seminar. INRIA Saclay, France, June 2014.
- Towards Extracting Explicit Proofs from Totality Checking in Twelf. The 8th ACM SIGPLAN International Workshop on Logical Frameworks and Metalanguages: Theory and Practice. Boston, USA, September 2013.
- The Abella Approach to Specifying and Reasoning about Formal Systems. Midwest Verification Day 2012. University of Kansas, USA, September 2012.
- New Developments with the Abella System. Workshop on Abella and Bedwyr. Ecole Polytechnique, France, July 2012.
- AMIBE: an Imperative Programming Language with First Class Continuations. Midwest Verification Day 2011. University of Minnesota, USA, September 2011.

Academic Service

- External reviewer for Interactive Theorem Proving (ITP) 2014 and 2015.

Awards and Affiliations

- ACM Student Member, since 2013.
- Graduate Dissertation Fellowship, Graduate School, University of Minnesota, 2014-15.
- Travel Award, NSF-INRIA grant entitled "Research Experience for US Students at INRIA" (REUSSI), 2012.
- Graduate Fellowship, Department of Computer Science and Engineering, University of Minnesota, 2011-12.
- Guanghua Scholarship for M.S., Shanghai Jiao Tong University, 2008.
- Excellent Graduate of Shanghai Jiao Tong University, 2006.
- Academic Excellence Scholarship, Shanghai Jiao Tong University, 2003 and 2004.