

YUYAN BAO

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RESEARCH INTERESTS

Formal methods (formal specification and verification, specification language design and semantics, programming analysis), programming languages, language-based security

EDUCATION

University of Central Florida

Aug.2010 - Dec.2017

Doctor of Philosophy in Computer Science

Dissertation Title: Reasoning About Frame Properties in Object-Oriented Programs

Dissertation Supervisor: Gary T. Leavens

External Committee: David A. Naumann

Beihang University

Mar.2004 - Mar.2007

Master of Software Engineering

Thesis Title: Design and Implementation of Audio and Video Advertisement Acquisition and Recognition System

Thesis Supervisor: Yun Liu

Beijing University of Technology

Sep.1999 - Jul.2003

Bachelor of Computer Science & Technology

EXPERIENCE

University of Central Florida

Aug.2010 - Dec.2017

Research Assistant

Florida, United States

- Designed Fine-grained Region Logic (FRL) that is adapted from region logic. It expresses regions at the granularity of individual fields, and introduces conditional region expressions. It can encode supported separation logic (SSL) assertions. A prototype of FRL was developed, and is available from <http://dafnyr.codeplex.com/>. It is adapted from Dafny and uses Boogie to generate verification conditions.
- Designed Unified Fine-grained Region Logic (UFRL) that is a generalization of FRL. UFRL merges read and write effects into the logic along with separation, and provides partial reasoning and global reasoning. A formal connection between SSL and FRL can be established in this framework.
- Defined a frame condition for behavioral subtyping, which is proved sound. Framing for subtyping handles extended states in subtype objects through a novel notion of encapsulation.

Pactera Technology International Ltd.

Dec.2005 - Aug.2010

Software Developer Engineer for Testing Outsourcing to Microsoft

Beijing, China

- Developed automating test frameworks and test tools for various projects, including OELive Mail Client, Messenger, Messenger server components and Spec Explorer

Beijing Putian Peace Communication Technology Company

Jul.2003 - Dec.2005

Software Engineer

Beijing, China

- Implemented call center middleware and clients

- Participated in designing and implementing Audio and Video Advertising Acquisition and Recognition System

PUBLICATIONS

- **Yuyan Bao**. *Reasoning About Frame Properties in Object-Oriented Programs*. PhD thesis, University of Central Florida, 2017
- **Yuyan Bao**, G. T. Leavens, and G. Ernst. Conditional Effects in Fine-grained Region Logic. In *Proceedings of the 17th Workshop on Formal Techniques for Java-like Programs, FTfJP '15*, pages 5:1–5:6, New York, NY, USA, 2015. ACM
- **Yuyan Bao** and G. T. Leavens. Frame Conditions for Behavioral Subtyping that Support Local Reasoning and Extended State. 2018 submitted
- **Yuyan Bao**, G. T. Leavens, and G. Ernst. Unifying Separation Logic and Region Logic to Allow Interoperability. *Formal Aspects of Computing*, 2017 under review
- **Yuyan Bao**, G. T. Leavens, and G. Ernst. Technical Report for Unifying Separation Logic and Region Logic to Allow Interoperability. Technical Report CS-TR-16-01, Computer Science, University of Central Florida, Orlando, Florida, Dec. 2016. <http://www.cs.ucf.edu/~ybao/tech-reports/FRL-UFRL-TR.pdf>
- **Yuyan Bao**, G. T. Leavens, and G. Ernst. Translating Separation Logic into Dynamic Frames Using Fine-Grained Region Logic. Technical Report CS-TR-13-02a, Computer Science, University of Central Florida, Orlando, Florida, March 2014. <http://www.cs.ucf.edu/~leavens/tech-reports/UCF-CS-TR-13-02/TR.pdf>

PROJECTS

- **Yuyan Bao** and G. Ernst. A KIV project for proving encoding supported separation logic into unified fine-grained region logic. <http://www.cs.ucf.edu/~ybao/project/frl-sep-expr/index.xml>, 2016
- **Yuyan Bao** and G. Ernst. A KIV project for defining semantics for intuitionistic separation logic. <http://www.cs.ucf.edu/~ybao/project/sl-semantics/index.xml>, 2016
- **Yuyan Bao**. A prototype of fine-grained region logic adapted from Dafny. <http://dafnyr.codeplex.com/>, 2013

PRESENTATIONS

- Talk on Frame Constraints for Behavioral Subtyping, *JML Workshop*, Orlando, 2017
- Student talk on Unifying Fine-Grained Region Logic with Separation Logic, *Oregon Programming Languages Summer School*, Oregon, 2016
- Talk on Unified Fine-Grained Region Logic as a Foundation for Framing in JML, *JML Workshop*, Bad Herrenalb, 2016
- Talk on Conditional Effects in Fine-grained Region Logic, *FTfJP*, Prague, 2015

ACADEMIC ACTIVITY

- Help mentor Xiaolong Guo, who is a Ph.D. student in Security in Silicon Lab (SSL) <http://www.eecs.ucf.edu/~jinyier/Research.html>
- Referee a paper for Transactions on Modularity and Composition I
- Referee a paper for Science of Computer Programming

PROFESSIONAL DEVELOPMENT

- Student volunteer for *SPLASH 2012*
- Attended the *CRA-W Graduate Cohort Workshop 2012*
- Attended the *Summer School on Formal Techniques* (2011 - 2014)
- Attended *Marktoberdorf Summer School on Dependable Software Systems Engineering* (2014)
- Attended the *Oregon Programming Languages Summer School* (2015 - 2016)

PROFESSIONAL SOCIETIES

- Student member of the Association for Computing Machinery
- Member of the IEEE Computer Society
- Member of the European Association for Programming Languages and Systems

SKILLS

- Visual Studio Extensions, .Net framework, C#, Java, C++, C, Oz, Boogie
- SQL Server
- Compiler Construction
- the KIV theorem prover, the Coq theorem prover

HONORS AND AWARDS

- Upsilon Pi Epsilon honor society membership, 2012
- Scholarship: Beijing University of Technology, 2000

REFERENCES

Gary T. Leavens: leavens@cs.ucf.edu

David A. Naumann: dnaumann@stevens.edu

Yier Jin: yier.jin@ece.ufl.edu

Sumit Kumar Jha: sumit.jha@ucf.edu

CITIZENSHIP

Citizen of the People's Republic of China