

CURRICULUM VITAE

Feng Chen

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Research Interests

Automated software engineering and formal methods. Programming and specification language semantics, design and implementation. Software quality, safety and security. Dynamic and static program analysis and verification. Applications of logics, algorithms and theorem proving.

Education

- Ph.D.** Computer Science, University of Illinois at Urbana-Champaign, USA, 2009 (expected)
Dissertation: “Monitoring Oriented Programming and Analysis”.
Advisor: Professor Grigore Rosu
- M.S.** Computer Science, Peking University, China, 2002
Advisor: Professor Fuqing Yang
- B.A.** Computer Science, Peking University, China, 1999

Awards and Distinctions

Reverse chronological order:

- *ACM SIGSOFT Distinguished Paper Award*, for [ASE 2008].
- *C.L. and Jane Liu Award*, Department of Computer Science, UIUC, 2005. Prize offered once a year to a most promising graduate student.
- *Wu Si Award*, Peking University, 2002. Prize offered once a year to best graduate students.
- *Huawei Fellowship*, Peking University, 1998.
- *Xiyue Fellowship*, Peking University, 1997.
- *Excellent Student Awards*, Peking University, 1996, 1997 and 1998. Prize offered once a year to outstanding undergraduate students.

Professional and Academic Experience

Research

- Fall 2002 to present. **Research assistant.** Formal System Laboratory, Department of Computer Science, UIUC. Advisor: Grigore Rosu.

Involved in several NSF/NASA funded projects. Developed *monitoring oriented programming* (MOP), a generic and efficient framework for runtime monitoring and recovery. Many monitoring based approaches can be captured as special instances of MOP, while MOP generates more efficient monitoring code than other specialized approaches. Defined and implemented *sliced causality*, which drastically but soundly slices Lamport's happen-before causality using static analysis, and *predictive runtime analysis* (PRA), an effective technique to predict potential concurrency errors from observed executions. Implemented a PRA tool for Java, named jPredictor, which detected many unknown bugs in popular open source systems. Formalized the semantics of Java 1.4 in rewrite logic and implemented JavaRL, a static formal analysis framework for multithreaded Java programs. Co-implemented a static pluggable domain-specific policy checker for C based on a rewrite logic semantic definition designed for the symbolic execution of C.

- Summer 2005. **Research intern.** Foundations of Software Engineering Group at Microsoft Research. Mentors: Wolfram Schulte and Nikolai Tillmann.

Developed Axiom Meister, a tool to automatically infer interface contracts for .Net programs based on symbolic execution. It generates concise, human friendly and comprehensive specifications. Found design flaws of libraries.

- Fall 1999 to Summer 2002. **Research assistant.** Software Engineering Group, Department of Computer Science, Peking University, China. Advisor: Fuqing Yang.

Involved in several nation key research programs. Developed ABC, a tool-supported, architecture-based approach for component oriented software development. Implemented the core part of PKUAS, a high performance, adaptive application server.

- Summer 1999. **Research intern.** Bell Labs Research China. Mentor: Keqing Li.

Developed STAR-RE, a flexible Telecom maintenance management system.

Teaching

- Fall 2007. **Guest Lecturer** for CS422 "Programming Language Design" and CS476 "Program Verification". Department of Computer Science, UIUC.

- Fall 2006. **Guest Lecturer** for CS476 "Program Verification". Department of Computer Science, UIUC.

- Fall 2006. **Teaching assistant** for CS102 "Introduction to Computing for Non-Technical Majors". Department of Computer Science, UIUC. Lectured three one-hour sections per week.

- Fall 2001. **Teaching assistant** for "Advanced Software Engineering". Department of Computer Science, Peking University, China.

Publications

15 conference papers and 4 workshop papers; all available on line at <http://fs1.cs.uiuc.edu/~fengchen>.

- AOSD 2009.** “Dependent advice: A general approach to optimizing history-based aspects”, Eric Bodden, Feng Chen, and Grigore Roşu. Proceedings of *the 8th International Conference on Aspect-Oriented Software Development (AOSD)*, Charlottesville, Virginia, March 2 - 6, 2009. To appear. (Acceptance rate: unknown)
- ASE 2008.** “Efficient Monitoring of Parametric Context-Free Patterns”, Patrick Meredith, Dongyun Jin, Feng Chen, and Grigore Roşu. Proceedings of *the 23rd IEEE/ACM International Conference on Automated Software Engineering (ASE)*, L’Aquila, Italy, September 15 - 19, 2008. ACM Press, pages 148-157. **ACM Distinguished Paper Award.** (Acceptance rate: 12%)
- RULE 2008.** “A Rewriting Logic Approach to Static Checking of Units of Measurement in C”, Mark Hills, Feng Chen, and Grigore Roşu. Proceedings of *the 9th International Workshop on Rule-Based Programming (RULE)*, Hagenberg, Austria, July 18, 2008. Electronic Notes in Theoretical Computer Science, to appear.
- ICSE 2008.** “jPredictor: A Predictive Runtime Analysis Tool for Java”, Feng Chen, Traian Florin Şerbănuţă, and Grigore Roşu. Proceedings of *the 30th International Conference on Software Engineering (ICSE)*, Leipzig, Germany, May 10 - 18, 2008. ACM Press, pages 221-230. (Acceptance rate: 15%)
- RV 2008.** “Synthesizing Monitors for Safety Properties – This Time With Calls and Returns”, Grigore Roşu, Feng Chen, and Thomas Ball. Proceedings of *the 8th International Workshop on Runtime Verification (RV)*, Budapest, Hungary, March 30, 2008. Lecture Notes in Computer Science, Volume 5289, pages 51-68. (Acceptance rate: 33%)
- OOPSLA 2007.** “MOP: An Efficient and Generic Runtime Verification Framework”, Feng Chen and Grigore Roşu. Proceedings of *the 22nd ACM SIGPLAN International Conference on Object-Oriented Programming, Systems, Languages, and Applications (OOPSLA)*, Montreal, Quebec, Canada, October 21 - 25, 2007. ACM Press, pages 569-588. (Acceptance rate: 21%)
- CAV 2007.** “Parametric and Sliced Causality”, Feng Chen and Grigore Roşu. Proceedings of *the 19th International Conference on Computer Aided Verification (CAV)*, Berlin, Germany, July 3-7, 2007. Lecture Notes in Computer Science, Volume 4590, pages 240-253. (Acceptance rate: 24%)
- ICFEM 2006.** “Discovering Likely Method Specifications”, Nikolai Tillmann, Feng Chen, and Wolfram Schulte. Proceedings of *the 8th International Conference on Formal Engineering Methods (ICFEM)*, Macao, China, November 1-3, 2006. Lecture Notes in Computer Science, Volume 4260, pages 717-736. (Acceptance rate: 35%)
- SAS 2006.** “Parametric and Termination-Sensitive Control Dependence”, Feng Chen and Grigore Roşu. Proceedings of *the 13th International Static Analysis Symposium (SAS)*, Seoul, Korea, August 29-31, 2006. Lecture Notes in Computer Science, Volume 4134, pages 387-404. (Acceptance rate: 28%)
- RV 2005.** “Checking and Correcting Behaviors of Java Programs at Runtime with Java-MOP”, Feng Chen and Grigore Roşu. Proceedings of *the 5th Workshop on Runtime Verification*

(RV), Edinburgh, UK, July 12, 2005. Electronic Notes in Theoretical Computer Science, Volume 144, pages 3-20.

- TACAS 2005.** “Java-MOP: A Monitoring Oriented Programming Environment for Java”, Feng Chen and Grigore Roşu. Proceedings of *the 11th International Conference on Tools and Algorithms for the Construction and Analysis of Systems (TACAS)*, tool paper, Edinburgh, UK, April 4-8, 2005. Lecture Notes in Computer Science, Volume 3440, pages 546-550. (Acceptance rate: 24%)
- ICFEM 2004.** “A Formal Monitoring-based Framework for Software Development and Analysis”, Feng Chen, Marcelo D’Amorim, and Grigore Roşu. Proceedings of *the 6th International Conference on Formal Engineering Methods (ICFEM)*, Seattle, USA, November 8-12, 2004. Lecture Notes in Computer Science, Volume 3308, pages 357-373. (Acceptance rate: 27%)
- CAV 2004.** “Formal Analysis of Java Programs in JavaFAN”, Azadeh Farzan, Feng Chen, José Meseguer and Grigore Roşu. Proceedings of *the 16th International Conference on Computer Aided Verification (CAV)*, tool paper, Boston, MA, USA, July 13-17, 2004. Lecture Notes in Computer Science, Volume 3114, pages 501-505. (Acceptance rate: 22%)
- ASE 2003.** “Certifying Measurement Unit Safety Policy”, Feng Chen and Grigore Roşu. Proceedings of *the 18th IEEE International Conference on Automated Software Engineering (ASE)*, system paper, Montreal, Quebec, Canada, October 6-10, 2003. IEEE Computer Society, pages 304-309. (Acceptance rate: 13%)
- RV 2003.** “Towards Monitoring-Oriented Programming: A Paradigm Combining Specification and Implementation”, Feng Chen and Grigore Roşu. Proceedings of *the 3rd Workshop on Runtime Verification (RV)*, Boulder, Colorado, USA, July 13, 2003. Electronic Notes in Theoretical Computer Science, Volume 89, pages 108-127.
- RTA 2003.** “Rule-Based Analysis of Dimensional Safety”, Feng Chen, Grigore Grigore Roşu, and Ram Prasad Venkatesan. Proceedings of *14th International Conference on Rewriting Techniques and Applications (RTA)*, Valencia, Spain, June 9-11, 2003. Lecture Notes in Computer Science, Volume 2706, pages 197-207. (Acceptance rate: 43%)
- ICFEM 2002.** “ABC/ADL: An ADL Supporting Component Composition”, Hong Mei, Feng Chen, Qianxiang Wang, and Yaodong Feng. Proceedings of *the 4th International Conference on Formal Engineering Methods (ICFEM)*, Shanghai, China, October 21-25, 2002. Lecture Notes in Computer Science, Volume 2459, pages 38-47. (Acceptance rate: 40%)
- ICSM 2002.** “Using Application Server To Support Online Evolution”, Qianxiang Wang, Feng Chen, Hong Mei, and Fuqing Yang. Proceedings of *18th International Conference on Software Maintenance (ICSM)*, Montreal, Quebec, Canada, October 3-6, 2002. IEEE Computer Society, pages 131-140. (Acceptance rate: 43%)
- CompSAC 2002.** “An Architecture-Based Approach for Component-Oriented Development”, Feng Chen, Qianxiang Wang, Hong Mei, and Fuqing Yang. Proceedings of *26th International Computer Software and Applications Conference (CompSAC)*, Oxford, UK, August 26-29, 2002. IEEE Computer Society, pages 450-455. (Acceptance rate: 38%)

Technical Reports in Submission

- 1) [TR 2008-4.] “Maximal Causal Models for Multithreaded Systems”, Traian Florin Șerbănuță, Feng Chen, and Grigore Roșu. No. UIUCDCS-R-2008-3017, Department of Computer Science, UIUC, 2008.
- 2) [TR 2008-3.] “Mining Parametric State-Based Specifications from Executions”, Feng Chen, and Grigore Roșu. No. UIUCDCS-R-2008-3000, Department of Computer Science, UIUC, 2008.
- 3) [TR 2008-2.] “Efficient Formalism-Independent Monitoring of Parametric Properties”, Feng Chen, Dongyun Jin, Patrick Meredith, and Grigore Roșu. No. UIUCDCS-R-2008-2996, Department of Computer Science, UIUC, 2008.
- 4) [TR 2008-1.] “Parametric Trace Slicing and Monitoring”, Feng Chen, and Grigore Roșu. No. UIUCDCS-R-2008-2977, Department of Computer Science, UIUC, 2008.

Presentations

- “Runtime Monitoring for Reliable Software”, seminar lecture, Department of Computer Science, Cornell University. April 15, 2008.
- “Runtime Monitoring for Reliable Software”, seminar lecture, Department of Electrical and Computer Engineering, University of Texas at Austin. April 3, 2008.
- “Runtime Monitoring for Reliable Software”, seminar lecture, College of Computing, Georgia Institute of Technology. March 4th, 2008.
- “Runtime Monitoring for Reliable Software”, seminar lecture, Department of Computer Science, University of Texas at Arlington. February 18th, 2008.
- “Parametric and Sliced Causality”, CAV 2007, Berlin, Germany. July 2007.
- “Parametric and Termination-Sensitive Control Dependence”, SAS 2006, Seoul, Korea. August 2006.
- “Discovering Likely Method Specifications”, with Nikolai Tillmann and Wolfram Schulte. Microsoft Research, Seattle, Washington, USA. August 2005.
- “Java-MOP: A Monitoring Oriented Programming Environment for Java”, TACAS 2005, Edinburgh, UK. April 2005.
- “A Formal Monitoring-based Framework for Software Development and Analysis”, ICFEM 2004, Seattle, Washington, USA. November 2004.
- “Formal Analysis of Java Programs in JavaFAN”, Formal Methods seminar, Department of Computer Science, UIUC. June 2004.
- “Certifying Measurement Unit Safety Policy”, ASE 2003, Montreal, Quebec, Canada. October 8, 2003.

Selected Software Systems Work

MOP. <http://fsl.cs.uiuc.edu/mop>

With Grigore Roşu at UIUC. An efficient and generic runtime verification framework.

jPredictor. <http://fsl.cs.uiuc.edu/jpredictor>

With Grigore Roşu at UIUC. A runtime predictive analysis tool to detect concurrency errors.

JavaFAN. <http://fsl.cs.uiuc.edu/javafan>

With Azadeh Farzan, Grigore Roşu and José Meseguer at UIUC. A static analysis framework for Java programs based on formal rewriting logic definitions of the Java semantics.

Professional Activities

- Organization committee for the 6th International Conference on Quality Software (QSIC'06), Beijing, China, October 27-28, 2006.
- Reviewer for 4 journals: Automated Software Engineering, IEEE Transactions on Dependable and Secure Computing, Journal of Logic and Algebraic Programming, Real-Time Systems.
- External Reviewer for 5 Conferences and Workshops: FOSSACS 2008, PLDI 2007, PADTAD 2006, RV 2006, RV 2005.