Chao Yan

Contact Information

Dept. of Computer Science, UBC
201-2366 Main Mall
Vancouver, BC, V6T 1Z4, Canada

Phone: 1-604-822-4487
E-mail: chaoyan@cs.ubc.ca
Web: www.cs.ubc.ca/~chaoyan

Research Interests

- Formal verification of circuits and hybrid systems
- Parallel Computing
- Algorithm design and numerical computation
- Computer architecture

Education

The University of British Columbia, Vancouver, BC, Canada

Ph.D. in Computer Science, expected May 2011

- Thesis Topic: *Reachability Analysis Based Circuit-Level Formal Verification*
- Supervisor: Mark R. Greenstreet

M.Sc. in Computer Science, August 2006

- Thesis Topic: COHO*: A Verification Tool for Circuit Verification by Reachability Analysis*
- Supervisor: Mark R. Greenstreet

Peking University, Beijing, China

B.Sc. in Computer Science, June 2003

- Thesis Topic: *Multi-clock Designs of SOC*
- Advisor: Xu Cheng

Experience

Research Assistant **Integrated System Design Lab, UBC** 2005 - present

I designed and implemented a verification platform COHO for analog circuits and hybrid systems.

- Developed and applied reachability analysis techniques to analog circuit verification problems
- Developed and implemented algorithms for circuit modeling
- Developed specification methods for analog verification
- Designed and implemented new algorithms for high dimensional polyhedral operations
- Designed and optimized algorithms for bounding solution of differential equations
- Implemented an efficient, interval-based, linear program solver
- Approximately 50,000 lines of Matlab and Java codes for COHO and related test cases, available on http://coho.sourceforge.net.
- Currently refactoring code and exploring parallel implementations.

Research Intern **Rambus, Inc., USA** 07/2008-10/2008
I designed and implemented algorithms to speed up circuit simulations and applied our method to verify Rambus' XIO devices.

Teaching Assistant **The Univ. of British Columbia, Canada** 2004-2007
I have been a teaching assistant for several courses, including "Computer Architecture", "Distributed Systems", "Numerical Computation", "Computer Vision" and "Introduction to Computation".

Team Lead **Uni-Genesoft Information Technology, China** 01/2004-08/2004
In a joint project with HP China, I developed an enterprise-grad network management platform iNMS. I also led the iSupport team to implement a JSP solution to provide a web-based technical support for small/medium businesses.

Intern **Sun China Engineering & Research Institute** 07/2003-12/2003
I deployed and enhanced development tools including Tinderbox, Bonsai and LXR. I built and tested RPM packages of Mozilla and Evolution for Sun's OS: Java Desktop System.

Research Assistant **MicroProcessor R&D Center, Peking Univ.** 2000 - 2003

- Designed and engineered an AMBA-PCI controller for general purpose CPUs, Unity805 and Unity863
  - RTL implementation of PCI master and slave
  - Developed with VDHL and verified by Synoposys' EDA tools
- Worked on the metastability problem and multi-clock domain circuit design for a SOC
- Built a visualization tool *SunShine* for VHDL designs
- Tested the assembler of a 16-bits/32-bits processor Unicore16/32

Publications

Chao Yan, Florent Ouchet, Laurent Fesquet, Katell Morin-Allory, "Formal Verification of C-element Circuits", *The* 17^{th} *IEEE International Symposium on Asynchronous Circuits and Systems (ASYNC)*, April, 2011. (Acceptance rate 29%)

Chao Yan, Mark Greenstreet, Jochen Eisinger, "Formal Verification of Arbiters", *The* 16^{th} *IEEE International Symposium on Asynchronous Circuits and Systems (ASYNC)*, May, 2010. (Acceptance rate 32%)

Chao Yan, Kevin Jones, "Efficient Simulation Based Verification by Reordering", *DVCon*, February, 2010. (Acceptance rate 39/123, 31.7%)

Chao Yan, Mark Greenstreet, "Verifying an Arbiter Circuit", *Proceedings of the* 8^{th} *Conference on Formal Methods in Computer Aided Design (FMCAD)*, November, 2008, pp 52-60. (Acceptance rate 39.3%)

Chao Yan, Mark Greenstreet, "Faster Projection Based Methods for Circuit Level Verification", *Proceedings of the* 13^{th} *Asia South Pacific Design Automation Conference (ASP-DAC)*, 2008, pp 410-415. (Acceptance rate 100/350, 28.5%)

Chao Yan, Mark Greenstreet, "Circuit Level Verification of a High-Speed Toggle", *Proceedings of the* 7^{th} *Conference on Formal Methods in Computer Aided Design (FMCAD)*, November, 2007, pp 199-206. (Acceptance rate 35.3%)

Chao Yan, Mark Greenstreet, Marius Laza, "A Robust Linear Program Solver for Reachability Analysis", *Mathematical Aspects of Computer and Information Sciences (MACIS)*, July, 2006, pp 231-242.

Talks

"COHO: A Reachability Analysis Tool for Circuit Verification", July 12, 2010, Grenoble Institute of Technology, Grenoble, France

"Circuit Verification: Reachability Analysis Approach", July 8, 2010, Verification over Discrete-Continuous Boundaries, Dagstuhl, Germany

"Analog Verification: A Model Checking Perspective", October 27, 2009, Nanjing University, Nanjing, China

"COHO: A Formal Verification Tool for AMS Circuit Using Reachability Analysis", August 28, 2008, Rambus, Los Altos, CA, USA

"Verifying an Arbiter Circuit", November 18, 2008, FMCAD 2008, Portland, OR, USA

"Faster Projection Based Methods for Circuit Level Verification", January 23, 2008, ASP-DAC 2008, COEX, Seoul, South Korea

"Circuit Level Verification of a High-Speed Toggle", November 14, 2007, FMCAD 2007, Austin, TX, USA

"A Robust Linear Program Solver for Reachability Analysis", July 26, 2006, MACIS 2006, Beijing, China

Technical Skills

Experienced with **software development** and **hardware design**

	`Software`	`Hardware`
`Language`	Java, C, C++, Matlab, Shell, Python, SQL, Erlang, Perl	VHDL, Verilog, Assembly
`Platform`	GCC, Eclipse, Visio Studio	RTL design, HSPICE, Synoposys' tools
`System`	Linux, Solaris, Windows	MIPS, x86, ARM, PCI

Awards

- UBC University Graduate Fellowship 2007-2008
- LG First Class Scholarship 2002-2003
- SHIJIAFU Academician Scholarship 2000-2002

Miscellaneous

- `Citizenship:` Permanent resident of Canada, citizen of China

References

Mark R. Greenstreet
Department of Computer Science
The University of British Columbia
201-2366 Main Mall
Vancouver, BC, V6T1Z4, Canada
+1-604-822-3065
mrg@cs.ubc.ca

Kevin Jones
Centre for Software Reliability
City University London
Northampton Square
London, EC1V 0HB, UK
+44-20-7040-0161
kevin.jones.1@city.ac.uk

Ian Mitchell
Department of Computer Science
The University of British Columbia
201-2366 Main Mall
Vancouver, BC, V6T1Z4, Canada
+1-604-822-2317
mitchell@cs.ubc.ca

Alan J. Hu
Department of Computer Science
The University of British Columbia
201-2366 Main Mall
Vancouver, BC, V6T1Z4, Canada
+1-604-822-6667
ajh@cs.ubc.ca