YAN PENG

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EDUCATION

Doctor of Philosophy, Computer Science — GPA 92.5 %
University of British Columbia, Vancouver, BC — Expected Nov. 2018

Master of Science, Computer Science — GPA 92.5 %
University of British Columbia, Vancouver, BC — Sept. 2015
THESIS - Combining SMT with Theorem Proving for AMS Verification

Bachelor of Engineering, Computer Science and Technology — Major GPA 3.9/4.0
Zhejiang University, Hangzhou, Zhejiang — June 2012
THESIS - Research on Technology of Large-Scale Web Video Topic Discovery

Chu Kochen Honors College, platform Foreign Languages&Engineering — English Minor
Zhejiang University, Hangzhou, Zhejiang — June 2012

RESEARCH EXPERIENCE

Research Assistant
Integrated System Design Lab (ISD), UBC — Aug. 2012 - Now

- Applying Theorem Proving and SAT solving to digital circuit formal verification problems.
- Combining Theorem Proving with SMT to verify properties of Analog/Mixed-Signal circuits and other physical systems (e.g. biomedical problems).
  - Verifying global convergence for a digital PLL using Smtlink - my integration of ACL2 theorem prover with Z3 SMT solver.
- Automatic differentiation to calculate small signal response and parameter sensitivities of circuits, comparing forward and backward methods.
- Optimizing the internal circuit representation of the Coho verification tool to improve simulation performance.

Student Intern (Part-time)
Oracle Labs, Redwood Shores, CA, US — Nov. 2014 - Dec. 2014 & May 2015 - Now

- Using Theorem Proving and SAT solving to detect glitches in Clock Domain Crossing circuitry.
- Applied the tool to real world Verilog designs.

Student Intern (Summer)
Oracle Labs, Redwood Shores, CA, US — Aug. 2014

- Detecting synthesis generated glitch errors in Clock Domain Crossing circuit designs – project feasibility experiments and project planning.

Student Research Training Plan (SRTP)
Digital media Computing & Design Lab (DCD), Zhejiang University — June 2010 - June 2012

- Web Video Data Mining Algorithms and the Applications.
- Multi-model integration, K-partite graph clustering.

PUBLICATIONS

[Short paper]*Finding Glitches Using Formal Methods*
Y. Peng, M. Greenstreet, the 22nd IEEE International Symposium on Asynchronous Circuits and Systems (ASYNC 2016).

[Full paper]*Extending ACL2 with SMT solvers*
Y. Peng, M. Greenstreet, the 13th Inernational Workshop on the ACL2 Theorem Prover and Its Applications (ACL2-2015).

[Full paper]*Integrating SMT with Theorem Proving for Analog/Mixed-Signal Circuit Verification*
Y. Peng, M. Greenstreet, NASA Formal Methods (NFM), Lecture Notes in Computer Science Volume 9058, 2015, pp 310-326.

[Dissertation]*Combining SMT with theorem proving for AMS verification: analytically verifying global convergence of a digital PLL*
Master of Science, Computer Science program, University of British Columbia, Vancouver, BC, Canada, April 28th 2015.

[Abstract]*AMS verification with Theorem Proving and SMT*
Y. Peng, M. Greenstreet, International Workshop on Frontiers in Analog CAD (FAC), Grenoble, France, July, 2014.

[Full paper]*Verifying Global Convergence for a Digital Phase-Locked Loop*
J. Wei, **Y. Peng**, G. Yu, M. Greenstreet, Proceedings of the 13th Conference on Formal Methods in Computer Aided Design (FMCAD), October, 2013, pp 113-120.

[Poster]*Verifying Global Convergence of a Digital Phase-Locked Loop with Z3*
Y. Peng, M. Greenstreet, International Workshop on Design Automation for Analog and Mixed-Signal Circuits, San Jose, CA, November, 2013.

TALK

Verifying Global Convergence of a Digital Phase-Locked Loop with Z3 Sept. 2013
Microsoft, Redmond, WA, US.

TEACHING EXPERIENCE

CPSC311 - Definition of Programming Languages Sept. 2015 - Dec. 2015
Course description: Programming language theory
Job: Preparing material and teaching tutorials, office hours; homework, project and exam marking.

CPSC312 - Functional and Logic Programming Sept. 2013 - Dec. 2013
Course description: Functional programming (Haskell and Prolog).
Job: Office hours, homework and exam marking, prepared and presented a lecture on programming in Scala.

APSC160 - Introduction to Computation in Engineering Design Sept. 2012 - Dec. 2012
Course description: C and hardware IO programming.
Job: Holding labs, office hours and marking exams.

SELECTED COURSE PROJECTS

Machine learning coding project - Support vector regression
Course: CPSC540 - Machine Learning — 2014, Winter, 1st Term

Automate convergence rate proof for gradient descent on quadratic functions
Course: CPSC540 - Machine Learning — 2014, Winter, 1st Term

Automatic Differentiation and Continuous System Formal Verification
Course: CPSC513 - Formal Verification — 2013, Winter, 2nd Term

EXTRACURRICULAR ACTIVITIES

Girls Learning Code Intro to Python for Teen Girls (ages 12-17), volunteer — June 11th

TED Open Translation Project (OTP) volunteer, contributor — April 2015 - now

Coursera Global Translator Community (GTC), volunteer — April 2015 - now

Google Translate Community, contributor — Oct. 2016 - now

Microsoft Technology Club, Operation Group, Group leader — Sept. 2008 - June 2012
- Microsoft Asia Research Institute Campus Tour, Assistant — March 2010
- The Fourth C Language Competition, Project Manager — Dec. 2009
- MSTC Academic Lecture Series, Project Manager — March 2009

PROGRAMMING SKILLS

Research-related Languages: ACL2, Z3, SPICE
Programming Languages: Common Lisp, Python and MATLAB, experienced C, C++, C#, Java, Racket, Haskell, Prolog, bash, SQL, assembly language, Verilog and etc.
Others: Emacs, Git, Latex, Visual Studio, Eclipse

AWARDS AND HONORS

2015-2016 Faculty of Science PhD Tuition Award
2012-2016 International Tuition Award
2012 Excellent Graduate Thesis
2009-2011 Third-Class Academic Scholarship of Zhejiang University
2008 Chu Kochen Honors College Student