

# Jiaying Li

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## EDUCATION

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SEP. 2013 - JUN. 2018 Ph.D in COMPUTER SCIENCE,  
**Singapore University of Technology and Design**, Singapore  
Advisor: Assoc. Prof. Jun Sun  
SEP. 2011 - JUN. 2013 Study in INSTITUTE OF COMPUTING TECHNOLOGY  
**Chinese Academy of Sciences**, Beijing, China  
SEP 2007 - AUG. 2011 B.Eng. in SOFTWARE ENGINEERING  
**Nankai University**, Tianjin, China  
GPA: 3.9/4.0; RANK: 3/134

## RESEARCH INTERESTS

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Software engineering, program analysis, machine learning

## RESEARCH EXPERIENCE

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SEP. 2016 - AUG. 2017 ZIMU: Complex invariant learning framework based on program structures

- Design an algorithm to partition program based on program structures and learn disjunctive invariants based on the resulting partitions;
- Design a heuristic algorithm to search for a good program partitioning which would lead to a disjunctive loop-invariant with fewer clauses by exploring the structure of the loop adaptively.

OCT. 2016 - APR. 2017 PTA-LEARN: Parametric timed automata verification with active learning

- Enhance the scalability of existing model checkers for PTA by adopting machine learning techniques;
- Form conjectures on the constraint based on sampling and classification techniques;
- Actively seek out informative parameter values and check the corresponding timed automata so that we converge to an accurate conjecture quickly/

DEC. 2015 - JUN. 2016 ZILU: Invariant generation framework based on classification and selective sampling

- Build an invariant learning framework based on program variable valuations in run-time and classification algorithms;
- Propose an active learning technique, known as selective sampling, to overcome the limitation of random sampling;
- Actively seek out informative parameter values and check the corresponding timed automata so that we converge to an accurate conjecture quickly;

OCT. 2010 - JUNE. 2011 AN OPERATING SYSTEM KERNEL

- Design a micro-kernel of operating systems based on the book 'Orange S' and Linux kernel version 0.11 source code;
- Implement most basic kernel functions, including process management, I/O, interprocess communication, File System, memory management.

## WORKING EXPERIENCE

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JUL. 2013 - SEP. 2013    Research assistant in ISTD, SUTD, Singapore  
DEC. 2012 - JUN. 2013    Research assistant in acs, ICT, CAS, Beijing, China  
MAR. 2012 - NOV. 2012    Research assistant in bwlab, ICT, CAS, Beijing, China  
OCT. 2011 - JAN. 2012    Developer in Trend Media Corporation Limited., Beijing, China  
OCT. 2009 - JAN. 2010    Developer in Sun Micro systems, Inc., Beijing, China

## SCHOLARSHIPS

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SEP. 2013 - AUG. 2018    SUTD President's Graduate Fellowship  
OCT. 2010 - JUN. 2011    First Prize National Fellowship  
OCT. 2009 - JUN. 2010    National Scholarship  
OCT. 2008 - JUN. 2009    National Endeavor Scholarship  
OCT. 2007 - JUN. 2008    Second Prize National Fellowship

## LANGUAGES

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CHINESE:    Mothertongue  
ENGLISH:    Fluent

## PUBLICATION LIST

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**Jiaying Li**, Jun Sun, Learning Disjunctive Invariants based on Loop Structures, *The 40th International Conference on Software Engineering*, Gothenburg, Sweden, 2018 (under review)

**Jiaying Li**, Jun Sun, Bo Gao and ´Etienne Andre´, Classification-based Parameter Synthesis for Parametric Timed Automata, *The 19th International Conference on Formal Engineering Methods*, Xi'an, China, 2017

**Jiaying Li**, Jun Sun, Li Li, Quang Loc Le and Shang-Wei Lin, Automatic Loop-invariant Generation and Refinement through Selective Sampling, *The 32nd IEEE/ACM International Conference on Automated Software Engineering*, Illinois, USA, 2017

Truong Khanh Nguyen,Tian Huat Tan, Jun Sun, **Jiaying Li**, Yang Liu, Manman Chen, Jin Song Dong, Scaling BDD-based Timed Verification with Simulation Reduction, *The 19th International Conference on Formal Engineering Methods*, Tokyo, Japan, 2016

**Jiaying Li**, An Invariant Inference Framework using Active Learning and SVMs, *The 20nd International Conference on Engineering of Complex Computer Systems*, Doctorial Symposium, Gold Coast, Austrilia, 2015.

## SERVICES

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Volunteer:                FM 2014  
Presentation:           ICECCS 2015, ICFEM 2016  
Teaching assistant:    Machine learning (undergraduate, ISTD, SUTD, 2014)  
                                 Elements of software construction (undergraduate, ISTD, SUTD, 2014)

## SKILLS

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Programming:           Professional in C, C++, bash shell, proficient in Python, Java  
Operating Systems:    Professional in Linux, proficient in Windows and Mac

## INTERESTS AND ACTIVITIES

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Technology, Open-Source, Programming, Marathon, Football, Diving, Swimming, Tennis