



Shuanglong Kan

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birth: 07-07-1988

RESEARCH INTERESTS

The topics that I am interested in include: (1) formal modeling and specification languages that can naturally characterize systems features; (2) formal verification techniques, such as model checking and theorem proving; (3) code generation from formal models; (4) runtime verification

WORK EXPERIENCE

Research Assistant

Oct. 2019-Now

Department of Computer Science and Engineering
TU Kaiserslautern, Germany

Supervisor: Anthony Lin

Research Topics: building certified string solvers. String solvers carrying proof objects

Research Fellow

Oct. 2017-Oct. 2019

School of Computer Science and Engineering
Nanyang Technological University, Singapore

Supervisor: Shang-wei Lin and Yang Liu

Research Topics: build the formal semantics of two real-world languages: *Rust* (a memory-safety language) and *Solidity* (a smart contract language)

Research Assistant

Sep. 2017-Oct. 2017

School of Computer Science and Engineering
Nanyang Technological University, Singapore

Supervisor: Yang Liu

Research Topics: build the formal semantics of *Rust*

Teaching Assistant

Sep. 2012-Dec. 2012

College of Computer Science and Technology
Nanjing University of Aeronautics and Astronautics, China

Supervisor: Zhiqiu Huang

Teaching Course: The principles of compiler design

Teaching Assistant

Sep. 2013-Dec. 2013

College of Computer Science and Technology
Nanjing University of Aeronautics and Astronautics, China

Supervisor: Zhiqiu Huang

Teaching Course: Software Metrics

EDUCATION

Doctor of Engineering (master-doctor combined program) Sep. 2011 - Jun. 2017

*College of Computer Science and Technology,
Nanjing University of Aeronautics and Astronautics, China*

Thesis: The Research on the Trustworthy Code Generation from SIGNAL

Advisor: Zhiqiu Huang

Courses : parallel and distributed systems, distribution calculation, formal methods, petri net, software quality analysis and measurement, theoretical computer science, advanced artificial intelligence, principle of model checking, etc.

Research Scholar Jan. 2016-Jun. 2016

IRIT, University Toulouse III, France

Tech Report: Semantics Preservation of the Translation from SIGNAL into Multi-threaded Code

Advisor: Jean-Paul Bodeveix and Mamoun Filali

Bachelor of Engineering Sep. 2007 - Jun. 2011

*College of Computer Science and Technology,
Nanjing University of Aeronautics and Astronautics*

Advisors: Zhiqiu Huang

Courses: C and C++ language, data structure, algorithm design and analysis, the principle of compiler, operating system, database, set theory and logic, automata theory, network, etc.

High School Sep. 2004 - Jun. 2007

Jiangsu DongHai Senior High School, China

Secondary School Sep. 2001 - Jun. 2004

Qinghu Secondary School, China

Primary School Sep. 1995 - Jun. 2001

Kanzhuzhou Primary School, China

QUALIFICATIONS

- College English Test Band 4(CET-4), Qualified
- College English Test Band 6(CET-6), Qualified

SKILLS

- **Programming Languages:** C, Java, OCaml, Rust
- **Formal Modelling and Verification Tools:**
 1. Spin model checker
 2. Coq
 3. Event-B

4. Synchronous language Signal
5. K-Framework (A rewriting-logic modelling tool)

PEER-REVIEWED JOURNAL PAPERS

1. Shuanglong Kan and Zhiqiu Huang, “Partial Order Reduction for the full Class of State/Event Linear Temporal Logic”, *Computer Journal* **61(5)**, 629-644 (2018).
2. Shuanglong Kan and Zhiqiu Huang, “Detecting safety-related components in statecharts through traceability and model slicing”, *Software - Practice and Experience* **48(3)**, 428-448 (2018).
3. Shuanglong Kan, Zhiqiu Huang, Zhe Chen, Weiwei Li, Yutao Huang, “Partial order reduction for checking LTL formulae with the next-time operator”, *Journal of Logic and Computation* **27(4)**, 1095-1131 (2016).
4. Weiwei Li, Shuanglong Kan, Zhiqiu Huang, “A Better Translation From LTL to Transition-Based Generalized Büchi Automata”, *IEEE Access* **5**, 27081-27090 (2017).
5. Shuanglong Kan, Zhiqiu Huang, Zhe Chen, Bingfeng Xu, “Bounded Model Checking of C Programs Using Event Automaton Specifications”, *Journal of Software* **25(11)**, 2452-2472 (2014). **Chinese Journal**

INTERNATIONAL CONFERENCES

1. Ke Jiang, David Sanan, Yongwang Zhao, Shuanglong Kan and Yang Liu, “A Formally Verified Buddy Memory Allocation Model.”, *24th International Conference on Engineering of Complex Computer Systems (ICECCS 2019)*, accepted (2019).
2. Zhe Chen, Junqi Yan, Shuanglong Kan, Ju Qian, Jingjing Xie, “Detecting Memory Errors at Runtime with Source-Level Instrumentation.”, *ISSTA 2019*, accepted (2019).
3. Shuanglong Kan, Zhiqiu Huang, Zhe Chen, Zhiqiu Huang, “Partial Order Reduction for State/Event Systems.”, *ICFEM 2016*, 329-345 (2016).
4. Shuanglong Kan, “Traceability and model checking to support safety requirement verification.”, *SIGSOFT FSE 2014*, 783-786 (2014).
5. Jean-Paul Bodeveix, Mamoun Filali-Amine, Shuanglong Kan, “A refinement-based compiler development for synchronous languages”, *MEMOCODE 2017*, 165-174 (2017).

PREPRINT arxiv & tech. report

1. Shuanglong Kan, David Sanán, Shang-Wei Lin and Yang Liu, “K-Rust: An Executable Formal Semantics for Rust.”, *CoRR abs/1804.07608*, 1-20 (2018).
2. Shuanglong Kan, Jean-Paul Bodeveix and Mamoun Filali-Amine, “Semantics Preservation of the Translation from SIGNAL into Multi-threaded Code”, *Tech Report*, 1-25 (2016).
3. Jiao Jiao, Shuanglong Kan, Shang-Wei Lin, David Sanán, Yang Liu, Jun Sun, “Executable Operational Semantics of Solidity”, *CoRR abs/1804.01295*, 1-22 (2018).

SERVICES

Assisting my supervisor in reviewing submissions from TACAS 2018, CCS 2018, FTSCS 2018, ATVA 2018

PROJECTS

1. Securify: A compositional Approach of Building Security Verified System, <http://securify.sce.ntu.edu.sg/>(Participant)
2. Research on Privacy Modeling and Verification in Evolving Cloud Computing, National Natural Science Foundation of China (Participant)