Zhonghan Wang

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Education

Institute of Software, Chinese Academy of Sciences   2021/09 – Present

Master of Engineering in Computer Science (CS), GPA 3.7/4.0   Beijing, China

- Courses: Mathematical Logic and Theory of Programming, Formal Language and Automata Theory
- Second-class Academic Scholarship

Nankai University   2017/08 – 2021/06

Bachelor of Science in Electronic Engineering (EE)   Tianjin, China

- GPA: 89.17/100, 3.71/4.0 (Rank: 6/45)
- Courses: Computer Principle, EDA Fundamental and Application, Analog Electronics Technology

Publications

Efficient Local Search for Nonlinear Real Arithmetic   VMCAI 2024, London

Code: https://github.com/yogurt-shadow/LS_NRA

Video: https://www.youtube.com/watch?v=CKGDRTXvKjk

- Introduce Local Search algorithm into all classes of SMT(NRA)
- Design boundary structure to compute Local Search operation incrementally
- Design Relaxation strategy for equalities constraints
- Implement based on Z3, beat all mainstream SMT Solvers on QF_NRA satisfiability instances of SMT_LIB.

Projects

Z3 Plus Plus: Gold medal in SMT-COMP   SMT-COMP 2022 & 2023

WebPage: https://z3-plus-plus.github.io/ Code: https://github.com/shaowei-cai-group/z3pp

- Implement sample-cell projection in Z3's Nlsat Solver
- Implement feasible region checker to shortcut unsat instances

Dynamic Variable Order of Nlsat   https://github.com/yogurt-shadow/z3-dnlsat

- Introduce VSIDS dynamic branching heuristic into Nlsat Solver
- Fasten solving procedure both on satisfiable and unsatisfiable instances

KeymaeraX: Verification of Hybrid Systems (CMU 15-424)   https://github.com/yogurt-shadow/CMU-15-424

- Self Solutions to practices in **Logical Foundations of Cyber Physical Systems**
- Use **KeymaeraX** to model and verify hybrid systems using dynamic differential logic (d$\mathcal{L}$) interactively

Work Experience

Alibaba Group   2022/10 - 2023/08

Research Internship in Operations Research

- Design Local Search Heuristic for advertising allocation problem

Programming Skills

Isabelle/HOL

Code: https://github.com/yogurt-shadow/Isar_Exercise

- Self Solutions to practices in **Concrete Semantics**

Programming Languages

C/C++, Java, Python, VHDL, Verilog, Shell, HTML, Java, CSS, SQL, Matlab etc.

English Level

TOEFL: Overall: 102 (Reading: 29, Listening: 25, Speaking: 22, Writing: 26)

GRE: Verbal: 159 Quantitative: 170 Writing: 3.5