

# HEXU LI

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## EDUCATION

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**M.E. in Software Engineering**, Nanjing University, GPA: 4.46/5 (89.2/100) Expected Sept 2023 - June 2026

Advisor: [Prof. Hengfeng Wei](#)

**B.E. in Software Engineering**, Nanjing University, GPA: 4.43/5 (88.6/100) Sept 2019 - June 2023

## PUBLICATIONS

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### Online Timestamp-based Transactional Isolation Checking of Database Systems

- **Hexu Li**, Hengfeng Wei\*, Hongrong Ouyang, Yuxing Chen, Na Yang, Ruohao Zhang, Anqun Pan
- IEEE 41st International Conference on Data Engineering, Hong Kong (**ICDE 2025**) [[paper](#)] [[code](#)]

## RESEARCH PROJECTS

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**Model-based Database Isolation Testing** June 2025 - Present

- Supervisor: Hengfeng Wei, Yuxing Chen
- Developed specifications of two mainstream database concurrency control protocols, MVCC and 2PL
- We are developing specifications of the corresponding transaction mechanisms, especially the fine-grained locking
- We are planning to exploit various lock modes and model checking approach to find bugs in the future

**Checking Consistency of Conflict-free Replicated Data Types (CRDTs)** Aug 2025 - Present

- Supervisor: Cheng Tan, Hengfeng Wei
- Implemented the baseline of checking CRDTs through Z3, following an axiomatic framework
- Converted the encoding into graph form, leading to better efficiency
- We are seeking a breakthrough in theory to further improve the performance of solving this NP-complete problem

**PolySAT: Abstracting Concurrency, Solely Through Observables** Sept 2023 - June 2025

- Supervisor: Cheng Tan, Hengfeng Wei
- Proposed PolySAT, a SMT solver, to solve general concurrency problems and verify various consistency models
- Abstracted concurrency via polygraph data structure, and formalized it as a SMT solver (PolySAT)
- Applied PolySAT to various concurrency scenarios, including database transactions, CRDTs and multithreading reads and writes on memory models

## RESEARCH EXPERIENCE

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**Research Intern at Tencent** Expected June 2025 - June 2026

- Supervisor: [Dr. Yuxing Chen](#)
- Participating in the “Model-based Database Isolation Testing” project

**Research Assistant at Northeastern University (Boston)** Sept 2023 - Dec 2023

- Supervisor: [Prof. Cheng Tan](#)
- Implemented prototype of PolySAT as well as some optimizations

## SELECTED COURSE PROJECTS

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### The Cminusminus Programming Language

Nov 2021 - Jan 2022

Course: Compilers, Lecturer: Hengfeng Wei from Nanjing University

- Defined the Cminusminus (Cmm) programming language which is a simplified version of the C language, using the ANTLR framework
- Defined the lexical rule and the grammar rule of Cmm and generated a lexer and a parser framework
- Implemented a semantic analyzer to check for context-sensitive errors and an intercode generator including 18 instructions under the framework, and both of them work by visiting the whole grammar tree

### JVVM: A JVM Simulator

May 2020 - Oct 2020

Course: Software Engineering and Computing I, Lecturer: Qin Liu from Nanjing University

- Implemented a virtual JVM supporting core mechanisms like inheritance, interface, polymorphism and so on
- Implemented basic execution steps and modeling of JVM, such as class file parser, class loader and memory
- Implemented more than 150 of total 205 instructions with reference to the JVM manual so that the final artifact can run a real moderately complex class file

## ACTIVITIES

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Teaching Assistant of C Programming Language at Nanjing University, 2024 Fall

Teaching Assistant of Compilers at Nanjing University, 2024 Spring

## HONORS & AWARDS

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National Scholarship of China (**top 4%**), 2025

Outstanding Student of Tencent Rhino-Bird Open Source Talent Development Program, 2025, 2024

Academic Scholarship, 2025, 2024, 2023

People's Scholarship, 2022, 2021

Outstanding Student of Nanjing University, 2021, 2020

China Merchants Bank All-in-one Card Scholarship, 2020

## SKILLS

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### Programming Languages

Java, Python, Golang, JavaScript, SQL, C/C++

### Tools & Frameworks

Linux, Git, Docker, SpringBoot, Vue.js, L<sup>A</sup>T<sub>E</sub>X