Tianyi Huang

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Education

University of Illinois at Urbana-Champaign, B.S. in Computer Science — Sept 2021 – Dec 2024

- GPA: 3.97/4.0
- Awards: Dean's List, James Scholar
- **Coursework:** Operating System, Programming Language, Formal Verification, Database Systems, Data Mining, Deep Learning, Computer Architecture, System Programming

Experience

Visiting Researcher, University of Virginia, VA — Aug 2024 – Now

- Conducting research on leveraging machine learning to enhance the efficiency of SAT-solving algorithms.
- Reviewing relevant literature, designing algorithms, and performing experimental evaluations to assess performance improvements.

Research Intern, University of Illinois at Urbana-Champaign – Champaign, IL — May 2024 – Sep 2024

- Participated in the *SysNet* research group, performing in-depth analysis of over 50 bugs in widely-used Kubernetes operators, identifying root causes and proposing solutions.
- Developed a *static analysis tool* in CodeQL to detect a specific type of bug in operator implementations.

Research Intern, Chengdu Rural Commercial Bank Co., Ltd – Chengdu, China — May 2023 – Aug 2023

- Developed an advanced search engine using text2vec and LLM, enabling bank employees to quickly retrieve information on previously encountered issues.
- Applied Graph Convolutional Networks to model bank transactions and user behavior, improving the detection of money laundering activities.

Course Assistant, University of Illinois at Urbana-Champaign – Champaign, IL — Aug 2022 – Dec 2022

- Served as a course assistant for *MATH 257: Linear Algebra with Computational Applications*, conducting weekly office hours to assist and resolve inquiries for over 100 students..
- Delivered hands-on guidance to students during weekly lab sessions, assisting with coding exercises.

Projects

SuikaBlog: Blog Engine for Embedded Systems — github.com/TwinIsland/SuikaBlog

- Implemented a blog engine for embedded systems, featuring a FIFO cache and an extensible plug-in system for enhanced functionality.
- Developed in pure C, the system was optimized for minimal memory footprint and CPU overhead through strategic web framework modifications and meticulous program design.

Canfig: Advanced Configuration Language — github.com/TwinIsland/Canfig

- Designed a configuration language allowing developers to define custom data types and enforce validation rules using SQL-like grammar, with support for trigger-based error recovery using Python.
- Designed and implemented the full interpreter.

Octave: Music Programming Language — burnham310.github.io/Octave

- Designed a language that allows users to create music programmatically, using a syntax similar to traditional music notation, with support for variables, branching, loops, with the output compiled into MIDI files.
- Implemented the compiler backend, contribute to grammar design, lexer, and type system.

Technologies

Languages: C, C++, Python, Java, SQL, OCaml, Maude, JavaScript

Technologies: CodeQL, Linux, Kubernetes, PyTorch, MySQL, LaTex, Nginx, React