Chaofan Lin

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Education

Shanghai Jiao Tong University, Shanghai, China Aug. 2020 – Present

Bachelor in Computer Science.

- A member of **ACM Honors Class**, an elite CS program in SJTU.
- **GPA:** 94.10 / 100 | **Ranking:** 1 / 33.
- **Selected Courses:** Compiler 100/100, Operating System 100/100, Machine Learning 97/100, Mathematical Logic 100/100, Advanced Compiler 100/100, Algorithm 98/100. (And other 20 A+ courses)

Research Interest

I am interested in designing computer systems and studying elegant mathematical theories. Specifically, my research interest lies in domain-specific computer systems, such as systems for AI and compilers. I'm also enthusiastic about using self-contained math theory to explain a computer system.

Experience

Catalyst, Carnegie Mellon University *Research Intern* 2022 – Present

Advised by Tianqi Chen. Machine Learning System.

- Working on Relax, which is the nextgen graph-level IR of TVM.
- I developed a training workflow for Relax, including registration mechanism of operator gradients, the automatic differentiation pass and a collection of loss functions and optimizers.

Open Source Present

- Committer of apache/tvm. (Author of 20+ PRs)
- Maintainer and a main contributor of ACM Class Online Judge. This OJ is widely used in SJTU by many courses.

Honors and Awards

Scholarships

- National Scholarship. (*Top 0.2% national-wide.*) 2022
- Foresight-Sequoia Talent Development Fund. (*5 winners each year in SJTU.*) 2021
- Zhiyuan Undergraduate Excellence Award. *A-level, the highest.* 2021
- Zhiyuan Honorary Scholarship. 2020, 2021, 2022

Competitions

- The Chinese Mathematics Competitions (Shanghai Region). *First Prize.* 2022
- Mathematical Contest In Modeling and Interdisciplinary Contest In Modeling. *Meritorious Winner.* 2021

Selected Projects

Masterball *Course Project of Compiler Design* 2021

- A toy compiler implemented in Java, from Mx* (a C++ and Java-like language) to RISC-V assembly.
- With many optimizations in LLVM IR level, it has a performance close to GCC O2 on testcases.
- Implemented a interpreter of LLVM IR with simple Just-In-Time (JIT) technique supported.

Received a **perfect score** in two different compilation courses.

NightWizard *Course Project of Computer Architecture* 2021

A RISC-V CPU implemented in Verilog HDL, using Tomasulo algorithm for dynamic scheduling.

CoconutJVM 2022

A toy JVM (Java Virtual Machine) written in C++. Now it doesn't contain JIT complication so its execution engine is just a Java bytecode interpreter.

Distributed Hash Table *Course Project* 2021

A DHT with both chord protocol and kademlia protocol supported. Implemented in Golang.

fscape *Course Project of Operating System* 2022

A game based on a simple self-implemented FUSE filesystem. Use 'cd' to move, find a specified file in the file system to escape from this file system maze.

DiffAnnot: Improved Neural Annotator with Denoising Diffusion Model *Course Project of Computer Vision* 2022

Use diffusion model to refine the result of previous 3D human reconstruction methods. I lead our group finishing this course project and it is accepted by the conference ICIPMC 2023.

TALKS

Cross Platform Training Using Automatic Differentiation on Relax IR 2023

At TVM Conference 2023. [Video Record]

TEACHING

Advanced Compiler, Shanghai Jiao Tong University Spring, 2023

Teaching Assistant With Prof. Yong Yu

I gave several talks on Polyhedra model, Loop Optimizations and Register Allocation in this course. [Lecture Notes]

Mathematical Logic, Shanghai Jiao Tong University Fall, 2022

Teaching Assistant With Prof. Qiang Yin and Yijia Chen

Programming Design (A), Shanghai Jiao Tong University Fall, 2021

Teaching Assistant With Prof. Huiyu Weng

I help students in this course implement a simple Python 3 Interpreter.

SKILLS

- Programming Languages: Python, C/C++, Java, Verilog, Go, Web (HTML, CSS, JavaScript), LaTeX.
- Deep Learning Framework: Pytorch, Tensorflow.
- Some knowledge about FP (Functional Programming), related languages (Haskell, SML) and Type Theory.
- English: CET-6 600, CET-4 661.