Runsheng Bai

brs21@mails.tsinghua.edu.cn / +86 13520785205

EDUCATION

School of Software, Tsinghua University (THU), Beijing *Sep 2021 – Jul 2025 (Expected)*

Major in Software Engineering

Overall GPA: 3.95/4.0; **Major GPA:** 3.95/4.0

GPA Ranking: 1st among 79 students

Core courses: *Programming Methodology (A), Data Structure (A), Introduction to Algorithms (A-), Operating System (A, scored 96 in the final exam, 1/112), Formal Language and Automata (A), Fundamentals of Digital Electronics (A), Advanced topic in Linear Algebra (A, top 5 in the final exam), Discrete Mathematics (A-), Probability and Statistics (A), Introduction to Complex Analysis (A+), Ordinary Differential Equations (A+).*

Honors and Awards:

Software Creative Innovation Competition at Tsinghua University *2023*

Dong Fang Electronic Corporation Scholarship *2023*

National Scholarship (1 out of 82) *2022*

RESEARCH INTERESTS

Machine Learning, including computer vision, ML associated system, generative model, and other innovative fields.

RESEARCH EXPERIENCE

Project Depyf: A Tool for Understanding torch.compile() | THU | *Research Assistant* *Oct 2023 – Present*

Advisor: Associate Professor Mingsheng Long, School of Software, THU

- Developed depyf, a useful tool to open the opaque box of torch.compile() by decompiling the python bytecode and hooking functions.
- Assisted in designing the code logic to handle the reachability issues that had been caused by JUMP ABSOLUTE in Python bytecode, and helped deal with the with ... except ... code block.
- Conducted various experiments, including verifying the correctness of the decompiler and assessing the ability of depyf to open the models compiled by torch (Models are from Hugging face, Torchbench and Timm).
- Achieved a 100% success rate on the tested 85 python decompilation cases and 140 deep learning models, while the best among the others achieved 78 out of 85 and 27 out of 140, which demonstrated its potential.
- Expected to publish the paper as the second author. Github link: https://github.com/thuml/depyf.git

Adaptive Temporal Patching for Time Series Forecasting | THU | *Research Assistant* *Jun 2023 – Oct 2023*

Advisor: Associate Professor Mingsheng Long, School of Software, THU

- Conducted a research on LSTF (long-sequence time forecasting) by using data from ETT and many other datasets to perform prediction tasks.
- Studied with FEDFormer, AutoFormer, Dlinear, PatchTST and other advanced models, and reproduced some of them; proposed my very own design by using the principle of ”Patching” to dynamically partition information units in a sequence.
- Ongoing work on the model development with devised block “Adaptive Temporal Patching”, ”Unit interaction” and ”Result Generation”.

Low-Light Image Reconstruction from Event Cameras | THU | *Participant* *Oct 2022 – May 2023*

Advisor: Associate Professor Yue Gao, School of Software, THU

- Proposed using event camera data which shows light changes over time to reconstruct images in low-light conditions.
- Individually built a reconstruction network by combining U-Net and Vision Transformer ideas via Pytorch, extracting event information with convolution and merging it into the image for subsequent reconstruction.
- Achieved an “A” grade in the project assessment and demonstrated the ability to incorporate personal insights into neural network development; gained valuable skills in machine learning and Pytorch through this project.

SKILLS

- **Proficient:** C/C++, Python, Pytorch, Git.
- **Mastered:** Latex, Java, JavaScript, html/css.
- **Known:** Matlab, Win32 assembly.