HAOWEI (Howard) ZHU

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EDUCATION

Northeastern University, San Jose, United States Master of Science in Computer Science

Shenzhen University, Shenzhen, China Bachelor of Engineering in Computer Science and Technology

TECHNICAL SKILLS

- Languages: C. Pvthon, Rust, C++, Shell Script, Awk, Go, JavaScript, HTML/CSS, SOL, C#, Lisp.
- Frameworks: React, FastAPI, Gin, Vue.is, libbpf.
- Tools: eBPF, Linux, Nginx, Git, GNU Make, CMake, Vim, Systemd, Elasticsearch, Redis, PostgreSQL, Spark.

PROJECT EXPERIENCE

Google Summer of Code, Linux Kernel - Perf trace and BTF Link

- Contributed over 1,000 lines of code patches that were merged into Linux kernel version 6.12 (180,000 stars on GitHub), used by 56 million PCs and 96.4% of the top one million web servers. Link
- Developed a collector for struct, buffer, enum, and string arguments in system calls using **eBPF** and **BTF**, enhancing **perf trace** functionality and collecting **130%** more pointer arguments. *Link Link*
- Enabled real-time analysis of CPU idle time for **perf record**, achieving **millisecond-level** granularity. *Link* Fixed various bugs in **perf**, enabling tracing for **11%** more system calls and adding **Clang** build support for
- over **38%** of Linux machines. Also participated in code reviews and testing. Link Link Link Created documentation for **multiple** new features and wrote development blog posts. *Link*

eBPF-based Performance Analysis and Visualization Tool - Sberf Link

- 09/2023 03/2024Enabled stack trace and CPU counter collection with eBPF, boosting speed by 37% compared to perf while using only 1% of the disk space required by perf.
- Implemented a built-in flame graph visualization feature, which is **178%** faster than **FlameGraph**.
- Leveraged **BPF CO-RE** to ensure portability across **45%** of all Linux machines worldwide.

Terminal File Explorer - Transgender.rs Link

- Implemented file exploration with Vim-like key bindings, file searching with regular expressions, and support for opening files with a preferred text editor, achieving a starting time **88 times** faster than **ranger**.
- Built the terminal UI entirely from scratch, reducing dependencies to only **libc** and **regex**. This resulted in a small executable, only 11% of the size of yazi, and minimal memory usage, just 7% of that used by ranger.

ByteDance Youth Camp - Search Engine Project Link

- 05/2022 08/2022Developed a search engine for the **Huawei Wukong** dataset, optimizing queries across **100 million** entries.
- Built the back-end using **Go** and **Gin** framework, designed the front-end UI with **Vue.is**, and deployed the application on a Linux server using Nginx, improving query response time by 48%.
- Implemented efficient indexing using **LevelDB**, boosting search speed by **60%**, and achieved accurate query • text segmentation with the **gojieba** library, enhancing search relevance by **35%**.

WORK EXPERIENCE

Software Engineer Intern, Loovee Inc., Shenzhen, China

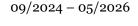
- Developed an AI dialogue chat assistant powered by the **ChatGLM2** large language model (LLM).
- Utilized the **fastllm** C++ acceleration library to increase model generation speed by over **50%**.
- Implemented an intuitive training framework with **LoRA** fine-tuning, with **80%** of users being non-technical.
- Created a user recommendation algorithm using **KeyBERT**, **Neo4j**, and **Elasticsearch**, improving performance by 15%. Developed a sensitive word filtering system using Redis, handling 90% of traffic.
- Achieved **multi-batch** LLM generation, resulting in up to a **3,000%** increase in generation speed.
- Integrated a retrieval-augmented generation system using **LangChain** and **Faiss**, boosting accuracy by 80%.

Software Engineer Intern, Mindray Medical International Ltd., Shenzhen, China 08/2022 - 09/2022

- Developed the CPO (Configure, Price, Ouote) system using the **SAP** system **Python API**.
- Resolved a third-party fee bug, accelerating the audit process by **40%**.

PUBLICATION

M. Saqib Nawaz, Shoaib Nawaz, Haowei Zhu, Unil Yun, SPM4GAC: SPM based approach for genome analysis and classification of macromolecules, International Journal of Biological Macromolecules. Link



09/2020 - 07/2024

04/2024 - 09/2024

07/2023 - 09/2023

02/2024 - 04/2024