Boming Zhang

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EXPERIENCE

Project Contributor   Jul. 2024 - Present
The University of Georgia, advisor Prof. Le Guan   *Athens, GA*
- Developing an **LLVM pass plugin** for advanced fuzz testing on communication protocols (USB, Bluetooth) for ARM32 embedded devices.

Software Engineer (Intern, Full-Time)   Feb. 2022 - Jul. 2022, Nov. 2022 - Jul. 2023
Naive Systems, advisor Xiao Jia, Kevin Sun   *Shanghai, China*
- Developed a static code analysis product using **LLVM**, focusing on system-level programming specifications.
- Implemented checkers utilizing **syntax trees, lexical analysis, and symbolic execution** for code analysis.
- Contributed to **LLVM**, submitting a bug report that reduced false-negatives by 10% in translation units.
- Optimized multi-process unit testing, achieving a **25x speedup** in test execution time.

Research & Development Engineer Intern   Jun. 2021 - Feb. 2022
Shanghai Zhimian Weiye Technology, advisor Prof. Mian Li, Dr. Ruixiang Zheng   *Shanghai, China*
- Built a IoT firefighting platform **from scratch**, focusing on **real-time system responsiveness**.
- With algorithm for efficient hazard detection, reducing false alarms by 95% with **millisecond response times**.
- Scaled the system to handle data from **over 7 million IoT devices**, while keeping high availability.

Teaching Assistant (Intro to OS, Intro to Comp.)   Sep. 2020 - Dec. 2020, Sep. 2021 - Dec. 2021
Shanghai Jiao Tong University, advisor Prof. Manuel Charlemagne   *Shanghai, China*
- Conducted lab sessions on operating systems concepts, including process management, memory allocation.
- Maintain online judge test cases and multiple servers for up to 150 students as part of the FOCS student system.

PROJECTS

Joint Online Judge | *Python3, Golang, PostgreSQL, Redis, Docker, CGroups, React.js*   Mar. 2021 - Present
- **Led a team of 6 undergraduate students** to develop and maintain a distributed online judge system from scratch. Provide stable, secure, fast, well-documented online judge service with various integrations for **over 1000 students in the institute**.
- Built secure sandbox using **Linux namespaces** and containerization for process isolation.
- Established development workflows, coordinated feature implementations, and mentored team members on system design and best practices of software engineering.

AList (Github 42.3k stars) | *Golang, Go Gin, GORM, Solid.js, WebDAV, SMB, S3, FTP*   Nov. 2022 - May. 2023
- **3rd main contributor**, focusing on implementing and optimizing **storage drivers for various protocols**.
- Designed and implemented a high-performance search feature, handling large-scale virtual file systems efficiently.
- Analyzed low-level protocols and network packets to improve system performance and security.

FOCS student system & related tools | *Python3, Golang, Node.js, Docker, Nginx*   Nov. 2018 - Present
- Maintained a comprehensive academic platform including online judge, Git service with CI platform.
- Improving Git service and online judge integration with CI platform and scripts for 4x faster submissions.
- Developed CLI tools for system automation, garnering 200+ monthly downloads on PyPI.

TECHNICAL SKILLS

Languages: C, C++, Python3, Golang, LLVM IR, Assembly (x86, ARM), Shell, SQL
Systems & Tools: Linux, Git, Docker, Podman, LLVM, GDB, Valgrind, Wireshark, VMware
Concepts: Operating Systems, Computer Architecture, Distributed Systems, Networking Protocols, Concurrency
Databases & Services: PostgreSQL, MongoDB, Redis, Nginx, GitHub Actions, Drone.io

EDUCATION

The University of Georgia (School of Computing)   Aug. 2023 - Present
*MSc in Computer Science (**GPA 3.9/4.0**)*   *Athens, GA*
- Relevant Coursework: Software Engineering (A), Privacy-Preserving Data Analysis (A), Data Mining (A)

Shanghai Jiao Tong University (UM-SJTU Joint Institute, ABET acred.)   Sept. 2018 - Aug. 2022
*BEng in Electrical and Computer Engineering (minor in Computer Science, **GPA 4.0/4.0**)*   *Shanghai, China*
- Relevant Coursework: Operating Systems (A+), Computer Architecture (A), Data Structures and Algorithms (A)
- **2020-2021 Undergraduate Excellent Scholarship**