

WENQING LUO

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EDUCATION

- University of Illinois at Urbana–Champaign** • Urbana, IL August 2021 – May 2023
Master of Science in Computer Science
- University of Illinois at Urbana–Champaign** • Urbana, IL August 2017 – May 2021
Bachelor of Science in Computer Engineering • GPA: 3.95/4.0 • Highest Honor
- Zhejiang University** • Hangzhou, China August 2017 – May 2021
Bachelor of Science in Computer Engineering • GPA: 3.87/4.0

WORK EXPERIENCE

- Alibaba Group** Software Engineer Intern – Search Infrastructure Jun 2020 – Dec 2020
C++, LLVM, Tensorflow, Machine Learning System Hangzhou, China
- Worked on building and optimizing a large-scale distributed search and recommendation system in support of Alibaba’s ecommerce websites, including Taobao, TMall, with over **900 million** Monthly Active User (MAU).
 - Developed an automated Just-In-Time (JIT) compilation system for online rank service by runtime linkage replacement on C++14 applications.
 - Use Clang/LLVM based toolchain to give dynamic type hints on containers of feature extractors and generate equivalent high performance static representation for later JIT optimization, which was deployed and validated under **300K peak QPS** during 2020 Double Eleventh Day shopping festival (**\$740 billion GMV** in one day).
 - Boosted more than **10% performance** of **entire** machine learning inference platform in Alibaba, achieved **100ms 99.96% SLA** for the ranking system, saved over **1000 CPU cores** in production environment.
- ByteDance (TikTok)** Software Engineer Intern – Network Infrastructure Feb 2021 – Jul 2021
Kernel, Service Mesh, envoy, Virtualization, DPDK, Qemu Shanghai, China
- Worked on optimizing service mesh (envoy) performance through kernel bypass and user-level TCP stack.
 - Built a glue socket kernel module allowing user use socket API to access DPDK based protocol stack.
 - Achieved in average **16% CPU improvement** for over 1K micro-service sidecars of Bytedance (TikTok) production system by implementing end-to-end zerocopy for the userspace TCP offload engine.
 - Automated CI/CD pipeline by developing a distributed VM testing framework using libvirt and consul.
- Tencent Inc** Software Engineer Intern – Product Jun 2019 – Aug 2019
Golang, Kubernetes, Python, Protobuf, Message Queue Shenzhen, China
- Developed a distributed performance testing tool for a RPC framework by providing a JavaScript Runtime and realtime serialization, which later becomes a popular production-grade project used by many teams at Tencent.
 - Built medical diagnosis services with Golang as a built-in module for the social app WeChat covering more than **30 million users**, which distributed batched user requests to ML inference engines by message queue.
 - Explored Protobuf + message queue to implement service discovery and load-balance for RPC call.
 - Deployed ML engines on Kubernetes to support auto scaling and CI triggered rolling update.

PROJECTS

- Sieve Project** – Research Project – [Link] – Selected to present at **KubeCon 2021** Jun 2021 – Present
Golang, Kubernetes, Distributed System Correctness
- Developed an automated testing tool, which systematically tests Kubernetes controllers to harden them against scenarios like asynchrony, unexpected failures, networking issues, and controller restarts.
 - Implemented instrument to operators and Kubernetes API server for cluster-wide event collection and analyzing.
 - The project has already discovered (and led to fixes for) more than **30 safety-critical bugs** in popular Kubernetes controllers for Zookeeper, Cassandra, RabbitMQ, MongoDB, XtraDB, etc.
- WeirdOS** – Course Project – [Link] Oct 2019 – Dec 2019
C, Assemble(x86), Qemu, Operating System, Network Stack
- Built a Linux like operating system by providing basic features including: memory paging, read-only filesystem, context switch, Round-robin scheduler, interrupt handlers, system calls.
 - Developed advanced extra features: dynamic memory allocator, DOM based GUI, **layer1-5 network stack** (from NIC driver to HTTP) and an Internet browser by combining GUI and network stack.
- Open-Source Contribution for VSCode and FireFox** – Open-Source Contribution Aug 2018 – Jun 2019
TypeScript, Electron.js, React.js
- Fixed several critical bugs related to git module and search widget in VSCode and DevTools in FireFox. The contribution was thanked by VSCode maintainers through its release notes.
 - Became experienced in open-source project contribution and maintenance.

TECHNICAL SKILLS

- Programming languages: C/C++, Python, Golang, Rust, JavaScript, TypeScript
- System & Cloud: Docker, Kubernetes, Linux kernel, LLVM, UNIX network programming, Qemu, DPDK
- Web Development: Git, Node.js, Golang, SQL, React.js, Vue.js, MongoDB, Redis, RabbitMQ, Protobuf