Chang (Kevin) Liu

Phone: (412)251-9235 E-Mail: kevinliu2021@cmu.edu
LinkedIn: www.linkedin.com/in/chang-liu-0716

EDUCATION

Carnegie Mellon University Pittsburgh, PA
Master of Science in Electrical and Computer Engineering - Applied Program (GPA: 3.92/4.0) Dec 2022

Wuhan University Wuhan, China
Bachelor of Engineering in Automation (GPA: 3.73/4.0) May 2020

COURSEWORK

Computer System	Software Technology Fundamentals	Embedded Operating System
C Programming Language	Computer Vision	Machine Learning

INTERNSHIP

Xiamen Saimo Jesoo Technology Co., Ltd. Xiamen, China
Software Development Engineer Intern Sep. 2020-Nov. 2020

- Modified a low-cost Segway chassis to build Automated Mobile Robot (AMR).
- Applied Google Cartographer SLAM algorithm and customized control strategy to reach 10cm repeat positioning accuracy.
- Improved system performance by utilizing hardware peripherals.

PROJECTS

SIMD Kernel Design and Implementation: SSAA (Carnegie Mellon University) Fall 2021

- Designed supersampling anti-aliasing (SSAA) circle-drawing kernel for x86 architecture using SIMD instructions.
- Analyzed calculation process, identified useful instructions, experimented on their properties (throughput and latency), and designed kernel accordingly.
- Improved performance by hiding instruction latencies, eliminating instruction bubble in pipelines and balancing workload between functional units.
- Implemented design and tested, achieved 6 times improvement in running speed.

Dynamic Memory Allocation Design and Implementation (Carnegie Mellon University) Spring 2021

- Designed and implemented data structures and internal mechanisms for Dynamic Storage Allocator.
- Doubled throughput by implementing segregated list algorithm.
- Applied self-balancing binary search tree on free block searching task to achieve best fit strategy, result in increased memory utilization from 65% to 71%.

Web Proxy Implementation (Carnegie Mellon University) Spring 2021

- Implemented Web Proxy that can handle HTTP/1.1 GET requests.
- Designed multithreading framework (POSIX) and ensured safe I/O operation (Robust I/O).
- Realized caching function for frequently visited web resources with LRU policy and improved local response speed.
- Integrated mutex semaphores to synchronize cache operation, prevent conflicts or race condition.

Backend Development: Bobing Game Server Summer 2021

- Designed, built, and tested a socket-based Java game server from scratch.
- Managed project using Maven and Git.
- Applied Java Thread to support multi-user online gaming, and MySQL to store user information.
- Deployed on AWS and tested all functions with customized client.

Image Recognition using Neural Network (Carnegie Mellon University) Fall 2021

- Built up neural network from scratch, derived and implemented forward-propagation, backward-propagation, and stochastic gradient descent.
- Applied neural network to classification tasks on NIST36 and Fashion-MNIST datasets.
- Learned Pytorch and Keras and reproduced classification task using these frameworks.

SKILLS

Programming Languages: C, C++, Java, Python, X86 Assembly, Bash
Environment and Tools: Git, GDB, SIMD, OpenMP, POSIX, Jupyter; Maven; Linux, Unix
Internet Services: Socket, HTTP, FTP, MySQL, AWS
ML & CV: Pytorch, Keras; OpenCV; numpy, scikit, matplotlib