HAOYANG SHI

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Home: **luke-skycrawler.github.io**

EDUCATION

Zhejiang University Hangzhou, China
B.S. in Computer Science Sep 2018 – Present

- GPA: 3.79/4.00 (86/100)

RESEARCH EXPERIENCE

Zhejiang University (State Key Lab of Computer Assisted Design & Computer Graphics) Hangzhou, China
Research Assistant under Professor Weiwei Xu March 2021 – Present

Auto quantization in taichi compiler for physical simulations

- Proposed to utilize the propagation of error formulae for estimation of the quantization error and calculate the required bits for a given simulation.
- Optimized the space complexity for the underlying prerequisite of partial differentials calculation. Devised an $O(logN)$ algorithm for simulation duration of N steps, as opposed to the existing $O(\sqrt{N})$ scheme.
- Learned the implementation and math details for Material Point Method and Finite Element Method.
- Participated in an ongoing effort to merge the feature into the taichi compiler.

Zhejiang University (Laboratory of Cyber Science and Technology) Hangzhou, China
Team member of ZJU representative for National Computer System Capability Challenge April 2021 – Aug 2021

AMipsel: an advanced mipsel processor

- A robust, configurable self-designed pipelining superscalar MIPS little-endian processor.
- Scored a 83.7x performance surplus over the baseline (highest in the contest history).
- Full-on operating system support including TLB and hardware interrupts; Booted successfully with the adapted operating system provided by the contest.
- Fully responsible for the design, testing, integration and quantified optimization of the cache system. Deeply engaged in backend implementation and the QEMU differential test framework.

Zhejiang University (Intelligent Computing and System Lab) Hangzhou, China
Undergraduate Student Research Training group member Sep 2020 – May 2021

Enchecap: An enclave-based heterogeneous calculation protocol based on Nvidia CUDA and Intel Secure Guard Extension (https://github.com/vtu81/Enchecap)

- Studied and examined the security fundaments of Intel SGX and relevant hardware protection researches on GPUs;
- Designed a heterogeneous calculation protocol between the host TEE and protected device.
- Responsible for the GPU side of the project: RSA cryptosystem implementation in native CUDA and its integration into the heterogeneous system.

SELECTED AWARDS AND HONORS

- First Prize (rank 2/121) in National Computer System Capability Challenge 2021
- First Prize in the Chinese Mathematics Competitions (Provincial) 2019
- First Prize in Chinese Physics Olympiad (Provincial) 2017

ADDITIONAL INFORMATION

Additional Professional and Extracurricular Experiences

- Member, Soccer School Team of CKC college (Sep. 2018-Present), won the 7th place out of 32 teams in school soccer championship 2020; scored 2 goals in all tournaments.
- Copiloted a social service to promote first-aid measures in practice (Guangzhou, Aug 2020); repertoire includes Heimlich Maneuver, CPR on dummies and AED guide;
- Interests: Soccer, Chess, Cycling, Swimming

Computer and Language Skills

- Programming: Python, C/C++, Javascript, scala
- Languages mastered: English(fluent), Chinese(native), Cantonese(fluent)
- TOEFL iBT MyBest superscore: 105/120 (Reading 30/30, Listening 30/30, Speaking 20/30, Writing 25/30)
- GRE: 325/340 (Verbal 155/170, Quantitative 170/170, Analytical Writing 3.0/6)