Guanzhou Hu

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EDUCATION

ShanghaiTech University *Sep 2016 - Jul 2020*

Candidate for B.E., Computer Science and Technology *Shanghai, China*

- GPA: 3.9 / 4.0 (rank 2 / 183)
- Honors: President's Scholarship (2017, 2018), Outstanding Student (2017, 2018)
- Relevant coursework: Computer Architecture III (graduate, A+), Compilers (A+), Parallel Computing (A+)

Massachusetts Institute of Technology *Sep 2019 - Jun 2020*

Undergraduate Special Student, Computer Science *Cambridge, MA, USA*

- Relevant coursework: Computer Networks (graduate, in progress), Artificial Intelligence (in progress)

University of Padova *Aug 2018 - Sep 2018*

Interdisciplinary Summer Program across Art and Science *Venice - Asiago - Padova, Italy*

- GPA: 4.0 / 4.0

University of California, Berkeley *Jul 2017 - Aug 2017*

Summer Session Attendee, Conflict Resolution *Berkeley, CA, USA*

- GPA: 4.0 / 4.0

PUBLICATIONS & PATENTS

- Yin, S. and Hu, G. 2019. *A Storage System Management Policy Based on Data Content Locality*. CN. Patent application 201910499391.9, filed in June 2019. Patent pending.

RESEARCH EXPERIENCE

Affordable AI: Cost-Efficient & Scalable Graph Convolutional Networks Computing Framework with the Aid of Serverless (Lambda) Computing *Jul 2019 - Present*

CSST Research Intern, University of California, Los Angeles, with Prof. Harry Xu *Los Angeles, CA, USA*

- Integrated new and emerging *serverless computing* techniques into traditional graph computing to build an affordable, efficient, and highly-scalable graph convolutional networks (GCNs) computing platform without expensive dedicated GPUs.
- Implemented the first workable prototype with AWS Lambdas service, and reached linear scalability and equivalent performance as GPUs in GCNs' tensor computation, meanwhile maintaining 100% cost-efficiency.

Real-Time Parallel GPU Cuckoo Hashing Optimizations with CUDA *Mar 2019 - Aug 2019*

Leader of project team, ShanghaiTech University, with Prof. Rui Fan *Shanghai, China*

- Recurred and improved the SIGGRAPH paper *Real-time parallel hashing on the GPU* (Dan A. Alcantara et al., 2009) with shared memory-optimized multi-level hashing. Achieved 10x speedup on insertion while maintaining the same performance at lookups.
- GitHub repository link: https://github.com/hgz12345ssdlh/cuckoo-hashing-CUDA.

NcTrace: Optimized Trace Data Storage with the netCDF Format *Mar 2019 - Aug 2019*

Leader of project team, ShanghaiTech University, L.I.O.N group, with Prof. Shu Yin *Shanghai, China*

- Optimized the storage of comma-separated values (CSV) trace data using the netCDF I/O library. Introduced the "dimension

packing" storage model which reduces the file size and accelerates users' analysis tasks.

- Tested with Google cluster traces, and achieved 7:1 size reduction with 2 orders of magnitude acceleration on reading.

Active I/O: High-Performance Parallel Content-aware Storage System *Jan 2019 - Aug 2019*

Research Assistant, ShanghaiTech University, L.I.O.N Group, with Prof. Shu Yin *Shanghai, China*

- Designed a high-performance, parallel file system named RosFS. It aims to dig out the "content locality" within highly-structured data formats used in various fields, such as Robot Operating System (ROS) bags and Visual Molecular Dynamics (VMD) molecules, by clustering data by topics and providing users a better locality when operating on a subset of topics.
- Tested with ROS bag files, and achieved 6.5x performance improvement on opening and at least 1.4x on reading.

pREFA: Tool for Analyzing and Demonstrating Regular Expressions and Finite Automata *Oct 2018 - Dec 2018*

Leader of project team, ShanghaiTech University, with Prof. Fu Song *Shanghai, China*

- Designed and implemented a tool for automatically analyzing and demonstrating the structure of regular expressions and finite automata used in computer language compilation process.
- Enabled fully automatic finite automata state graph generation using the Kalamada-Kawai dynamic plotting algorithm.
- GitHub repository link: https://github.com/hgz12345ssdlh/prefa-master.

TEACHING EXPERIENCE

Teaching Assistant in Computer Architecture *Feb 2019 - Apr 2019*

School of Information Science and Technology, ShanghaiTech University *Shanghai, China*

- Guided homework and projects on the Berkeley MIPS / RISC-V pipeline and parallel processing.

Teaching Assistant in Operating Systems *Sep 2018 - Jan 2019*

School of Information Science and Technology, ShanghaiTech University *Shanghai, China*

- Guided semester-long course projects on the *PintOS* system kernel from Stanford CS140.

Teaching Assistant in Discrete Mathematics *Mar 2018 - Jul 2018*

School of Information Science and Technology, ShanghaiTech University *Shanghai, China*

PRIZES & AWARDS

- Outstanding Research Award, CSST Program 2019, University of California, Los Angeles *Sep 2019*
- Second Class Prize, ASC Supercomputing Cluster Competition 2019 (team leader) *Mar 2019*
- Outstanding Teaching Assistant Award, School of Information Science and Technology *Jan 2019*
- Meritorious Winner, Mathematical Contest in Modeling (MCM) 2018 *Apr 2018*

VOLUNTEERING EXPERIENCE

- Volunteer at ShanghaiTech Symposium on Information Science and Technology (SSIST), Jul 2018
- Volunteer teacher for primary school migrant children, organized by the "Art Dream" Association, Fall term 2017
- Volunteer at Global AI Hackathon (Shanghai), Jun 2017

MISCELLANEOUS

- **Skills:** System programming, C/C++, Python, Rust, Linux servers, MIPS
- **Languages:** English (fluent), Chinese (native)