Sun Guangda

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EDUCATION

National University of Singapore, Singapore, Singapore   *2020 - present*
Ph.D. Candidate, School of Computing
Advisor: Jialin Li

Xi'an Jiaotong University, Shaanxi, China   *2016 - 2020*
School of Electronic and Information Engineering
Bachelor of Engineering in Computer Science and Technology, Honors Youth Program
Advisor: Hao Li

PUBLICATION

[1] **Guangda Sun**, Mingliang Jiang, Xin Zhe Khooi, Yunfan Li, Jialin Li. *NeoBFT: Accelerating Byzantine Fault Tolerance Using Authenticated In-Network Ordering.* Proceedings of the ACM SIGCOMM 2023 Conference. paper, pdf, code
Equip programmable switches with cryptographics and use them to improve ordering performance of BFT protocols.

[2] Hao Li, Yihan Dang, **Guangda Sun**, Changhao Wu, Peng Zhang, Danfeng Shan, Tian Pan, and Chengchen Hu. *Programming Network Stack for Physical Middleboxes and Virtualized Network Functions.* IEEE/ACM Transactions on Networking 32.2 (2023). paper, pdf

[3] Hao Li, Yihan Dang, **Guangda Sun**, Guyue Liu, Danfeng Shan, Peng Zhang. *LemonNFV: Consolidating Heterogeneous Network Functions at Line Speed.* 20th USENIX Symposium on Networked Systems Design and Implementation (NSDI '23). paper, pdf, code *Efficient run-to-complete network function virtualization that is as robust as process-level isolated solutions.*

[4] Hao Li, Changhao Wu, **Guangda Sun**, Peng Zhang, Danfeng Shan, Tian Pan, Chengchen Hu. *Programming Network Stack for Middleboxes with Rubik.* 18th USENIX Symposium on Networked Systems Design and Implementation (NSDI '21). paper, pdf, code *Generate protocol stack implementations of either standard or modded protocols for network functions with a fexible programming model and minimal coding effort.*

[5] Hao Li, Peng Zhang, **Guangda Sun**, Wanyue Cao, Chengchen Hu, Danfeng Shan, Tian Pan, Qiang Fu. *Compiling Cross-Language Network Programs Into Hybrid Data Plane.* IEEE/ACM Transactions on Networking 30.3 (2021). paper, pdf

[6] Hao Li, Peng Zhang, **Guangda Sun**, Chengchen Hu, Danfeng Shan, Tian Pan, Qiang Fu. *A Modular Compiler for Network Programming Languages.* Proceedings of the 16th International Conference on emerging Networking EXperiments and Technologies (CoNEXT '20). paper, pdf, code *Universal, state machine based immediate representation for network programming and the compilation toolchain around it.*

[7] Hao Li, Peng Zhang, **Guangda Sun**, Chengchen Hu, Danfeng Shan, Tian Pan, Qiang Fu *An Intermediate Representation for Network Programming Languages.* Proceedings of the 4th Asia-Pacific Workshop on Networking (APNet '20). paper, pdf

RESEARCH EXPERIENCE

High performance and scalable blockchain   *Dec 2020 - present*
Advisor: Jialin Li, Assistant Professor, NUS
• Proposed a BFT protocol co-designed with cryptographic-enabled programmable switch that achieves

optimal latency and throughput.
• Designing a BFT protocol with scalable state to support big data applications on blockchains.

Software Defined Networks and Network Function Virtualization *Jan 2018 - May 2021*
Advisor: Hao Li, Associate Professor, XJTU
• Designed a compiler and an intermediate representation that universally support programming languages of software defined networks, allowing source code written in different languages to be translated and synthesized into single network configuration.
• Designed a compiler and a domain specific language for network protocol stack to automatically generate high performance network stack implementation for network functions with customizable protocol specifications.
• Designed a highly efficient, run-to-completion network function virtualization framework that achieves both process-level fault isolation.

HONORS

2023 Research Achievement Award, School of Computing, NUS
2020 NUS Research Scholarship

TEACHING

CS5223 Distributed System

TECHNICAL STRENGTHS

Programming languages	(Proficient) Rust, Python, (Not proficient because no one can) C++, (Extensively use) Coq, Java, LaTeX, (Some familiarity) C#, Haskell, TypeScript, OCaml, Erlang, Go, Ruby
Tools	AWS, LaTeX, VS Code
Development	Distributed systems and protocols, OS and network, compilers and interpreters, container, GitHub Actions, (basic understanding) graphic renderer