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liangcheng-yu

Liangcheng (LC) Yu

RESEARCH INTEREST

I am a 5th year Ph.D. student in the Department of Computer and Information Science at the University of Pennsylvania supervised by Prof. Vincent Liu. My research interests are broadly in systems and networking. I am particularly drawn to the tangible, interdisciplinary nature of the domain, encompassing distributed systems, programming languages, computer architecture, machine learning, and control theory. Thus, I am self-motivated to acquire knowledge with a problem-driven mindset. Recently, my interest has been around uncovering the potential of widespread underutilization through co-designing emerging applications, software, and hardware accelerators, driven by an internal vision toward zero-waste networked systems.

EDUCATION

University of Pennsylvania — **Philadelphia, USA**
Ph.D. Candidate, Computer and Information Science — *August. 2019 - Present*

KTH Royal Institute of Technology — **Stockholm, Sweden**
M.Sc., Electrical Engineering — *Aug. 2016 - Apr. 2019*
Program: Information and Network Engineering/Wireless Systems, GPA: 5.0/5.0
KTH-ZJU 3+2 joint program (1st year concurrent with 4th year of bachelor)

ETH Zürich — **Zürich, Switzerland**
Degree Project, Computer Science — *Feb. 2018 - Sep. 2018*

Zhejiang University — **Hangzhou, China**
B.Eng., Automation — *Sep. 2013 - June. 2017*

PUBLICATION

[P1] *(OSDI 2024, To Appear)* **Liangcheng Yu**, Xiao Zhang, Haoran Zhang, John Sonchack, Dan R. K. Ports, and Vincent Liu
Beaver: Practical Partial Snapshots for Distributed Cloud Services
USENIX Symposium on Operating Systems Design and Implementation, Santa Clara, CA, July 2024

[P2] *(SIGCOMM 2023)* Xinyi Chen, **Liangcheng Yu**, Vincent Liu, and Qizhen Zhang
Cowbird: Freeing CPUs to Compute by Offloading the Disaggregation of Memory
Proceedings of the ACM SIGCOMM Conference, New York, USA, September 2023

[P3] *(SIGCOMM 2022)* **Liangcheng Yu**, John Sonchack, and Vincent Liu
Cebinae: Scalable In-network Fairness Augmentation
Proceedings of the ACM SIGCOMM Conference, Amsterdam, Netherlands, August 2022

[P4] *(SIGCOMM 2022)* Yiran Lei, **Liangcheng Yu**, Vincent Liu, and Mingwei Xu
PrintQueue: Performance Diagnosis via Queue Measurement in the Data Plane
Proceedings of the ACM SIGCOMM Conference, Amsterdam, Netherlands, August 2022

[P5] *(NSDI 2022)* **Liangcheng Yu**, John Sonchack, and Vincent Liu
OrbWeaver: Using IDLE Cycles in Programmable Networks for Opportunistic Coordination
Proceedings of the USENIX Symposium on Networked Systems Design and Implementation, Renton,

WA, April 2022

[P6] *(SIGCOMM 2020)* **Liangcheng Yu**, John Sonchack, Vincent Liu
Mantis: Reactive Programmable Switches
Proceedings of the ACM SIGCOMM Conference, New York, USA, Virtual Event, August 2020

[P7] *(ToN 2020)* Xiuzhen Guo, Yuan He, Xiaolong Zheng, **Liangcheng Yu**, Omprakash Gnawali
ZigFi: Harnessing Channel State Information for Cross-Technology Communication
IEEE/ACM Transactions on Networking, vol. 28, no. 1, pp. 301-311, February 2020

RESEARCH & INDUSTRIAL EXPERIENCE

Microsoft Corporation **Redmond, Seatle**
Researcher Intern *May. 2023 - Aug. 2023*
Worked at the Networking Research Group of Microsoft Research on cloud-hosted financial exchanges.

Google LLC **Sunnyvale, California (Remote)**
Student Researcher *Sep. 2022 - April 2023*
Student Researcher *Aug. 2021 - April 2022*
Software Engineering Intern *May. 2021 - Aug. 2021*
Exploited in-network signals for host networking stack at the congestion control team of NetInfra.

Microsoft Corporation **Redmond, Seatle (Remote)**
Researcher Intern *May. 2022 - Aug. 2022*
Worked on the network benchmarks for FPGA SmartNICs at the Azure hardware architecture group.

Prior Ph.D.

Berkeley NetSys Lab, UC Berkeley **Berkeley, California**
Visiting Student Researcher *Sep. 2018 - Mar. 2019*
Mimicked heuristic-based packet scheduling algorithms with a Deep Reinforcement Learning abstraction.

Swedish Institute of Computer Science (RISE SICS) **Kista, Stockholm**
Research Intern *Oct. 2017 - Feb. 2018*
Merged EST-CoAPs stack on Contiki OS clients and REST CA Server for LwM2M certificate bootstrap in Internet-of-Things (IoT) networks.

Ericsson **Kista, Stockholm**
Software Developer Intern *Aug. 2017 - Jan. 2018*
Worked on the development of automated test using JCAT for the verification of 4G/5G Radio Access Network (RAN) product.

Tsinghua University **Beijing, China**
Research Intern *Jun. 2017 - Aug. 2017*
Applied SVM to decode Channel State Information (CSI) sequence bits for Zigbee to WiFi cross-technology communication with a receiver-initiated mechanism for heterogeneous wireless networks.

Communication Theory Department, KTH **Stockholm, Sweden**
Student Research Assistant *Dec. 2016 - May 2017*
Implemented HMM variants with EM and Viterbi algorithms in MATLAB to monitor household meter power consumption in smart grid network non-intrusively (NILM).

PROFESSIONAL SERVICES

Artifact Evaluation Committee: MobiCom 2024, FAST 2024, SIGCOMM 2023, SOSP 2023, CoNEXT 2023, CAV 2023, SIGCOMM 2022, CoNEXT 2022, OSDI 2022, ATC 2022, EuroSys 2021

Shadow TPC Member: IMC 2022, EuroSys 2021

Reviewer: IEEE/ACM Transactions on Networking 2023 & 2022 & 2020, IEEE Transactions on Dependable and Secure Computing 2021, IEEE Wireless Communications Magazine 2020

Student Volunteer: PLDI 2021, SIGCOMM 2020

TALKS

Unleash the Hidden Potential: Harnessing Underutilization in Terabit Networked Systems
University of College London, Virtual, Feb. 2024 (*slides*)
Office of the CTO team, Azure for Operators (AFO) Research, Microsoft, Virtual, Jan. 2024 (*slides*)

Fairtopia: A Democratized Cloud-hosted Financial Exchange Platform — Pushing Fairness To Extreme via Communication and Computation Synchrony
Networking Research Group, Microsoft Research Redmond, Aug. 2023 (*slides*)

Automatic In-network Control Empowered by Programmable Infrastructure
Networking Research Group, Microsoft Research Redmond, Virtual, Oct. 2022 (*slides*)
Azure for Operators (AFO) Research, Microsoft Research Redmond, Virtual, Sep. 2022 (*slides*)
Distributed Systems Laboratory, University of Pennsylvania, Philadelphia, PA, Sep. 2022 (*slides*)

Cebinae: Scalable In-network Fairness Augmentation
ACM SIGCOMM 2022, Amsterdam, Netherlands, Aug. 2022 (*slides*)

OrbWeaver: Using IDLE Cycles in Programmable Networks for Opportunistic Coordination
Harvard Systems + Theory group, Harvard University, Virtual, Aug. 2022 (*slides*)
USENIX NSDI 2022, Renton, WA, Apr. 2022 (*talk video*, *slides*)
Distributed Systems Laboratory, University of Pennsylvania, Virtual, Mar. 2022

Mantis: Reactive Programmable Switches
ACM SIGCOMM 2020, Virtual, Aug. 2020 (*talk video*, *slides*)
Distributed Systems Laboratory, University of Pennsylvania, Virtual, Mar. 2020

TEACHING ASSISTANT

CIS 553 Networked Systems, Vincent Liu (Spring 2020), University of Pennsylvania
CIT 595 Operating Systems, Boon Thau Loo (Summer 2020 MCIT Coursera Online), University of Pennsylvania
CIS 551 Computer and Network Security, Sebastian Angel (Fall 2020), University of Pennsylvania

AWARDS

Morris and Dorothy Rubinoff Award (Best Computer Science Ph.D. thesis at Penn), 2024
Penn Presidential PhD Fellow (≈ 38k USD stipend and 10k USD equipment fund anually), 2021-2024
HotNets 2022 Travel Grants, 2022
NSDI 2021 Student Grant, 2021
Ph.D. Fellowship, University of Pennsylvania, 2019-2020
Google Summer of Code 2019 student with Network Simulator 3 (NS-3), 2019
Master thesis grant (≈ 11k CHF), Zeno Karl Schindler Foundation, Geneva, Switzerland, 2018

ETH Zürich Swiss-European Mobility Program (SEMP) scholarship, 2018
Honorable mention, IEEE ComSoc student competition, 2017
KTH student ambassador for Information and Network Engineering, 2017
KTH one-year scholarship for academic excellence, 2017-2018
Honorable mention at the Mathematical Contest in Modeling (MCM), 2016
Outstanding student leader award of Zhejiang University, 2014
Scholarship for outstanding merits at Zhejiang University, 2014

MISC

Programming C/C++, Python, P4, Verilog, JAVA, MATLAB

Tools/Skills Network Simulator 3 (NS-3), programmable switch, SmartNIC, FPGA, ONIE, OpenBMC, Vivado, sysadmin, USRP Software-defined Radio, Tensorflow, DPDK

Languages English (Proficient), Chinese (Native), German (Elementary), French (Elementary)

Hobbies Piano, badminton, classical music, travelling, active MOOC learner

Extracurricular Activities I was actively involved in cultural and volunteer activities, sharing time with people from diverse backgrounds. I served as a KTH student ambassador helping out the new international students and answering their queries during 2017-2018. I served as co-president for ZJU chapter of FACES (Forum for American/Chinese Exchange at Stanford), a Sino-US cultural student organization, during 2015-2016. I was a junior member in ShARE (Share Analysis on Regional Economies) during 2013-2014 and attended the world seminar held at Porto, Portugal. I studied at Undergraduate Public Administration of Chu Kochen Honors College (elite college at ZJU) during 2015-2016. I also spent time at various organizations such as ZJU Entrepreneur Magazine as an editor during 2013-2014, student union during 2013-2015 and so forth.

REFERENCES

Available upon request.