

YANG CHENG

✉ newplan001@163.com · ☎ (+86) 186-6182-8256 · 🌐 <https://chengyang.info>

EDUCATION

Tsinghua University, Beijing, China 2016.09 – Present

Ph.D. student in Computer Science and Technology

Advisor(s): Prof. Jianping Wu and Assoc. Prof. Dan Li

Research Interests: I'm broadly interested in the intersection of computer networks & system architecture, devoted to building large-scale, high-performance networked systems, with special focus on distributed machine learning systems

University of Electronic Science and Technology of China, Chengdu, China 2012.09 – 2016.07

B.Eng. in Software Engineering (focus on embedded systems), graduating with honors

GPA/Ranking: 3.8/4.0, 1st/103

WORKING EXPERIENCE

Microsoft Research Asia, *Research Intern* 2018.04 – 2018.10

- Leading the AIPre project to accelerate end-to-end DL workflows in the cloud.

Chengdu Haocaiduo Agricultural Technology Co., Ltd., *Developing Engineer* 2014.06 – 2014.07

- Developing intelligent agricultural management system to simplify the management of crops;

Tsinghua University, *Teaching Assistant*

- [00240112-90], [undergraduates], Next Generation Internet Spring of 2018 & 2019
- [74120023-0], [graduates], Security Foundation and Frontier of Cyberspace Fall of 2017

SELECTED PROJECTS

Mars: practical data-driven routing with multi-agent reinforcement learning 2019.06 – 2019.12

- Exploring practically traffic scheduling for data-driven networks with multi-agent reinforcement learning.

AIPre: Boosting end-to-end DL workflows in the cloud 2018.04 – 2018.10

- Evaluate the performance bottleneck of DL systems (TF, PyTorch, Caffe) from the end-to-end perspective;
- Offload data preprocessing workloads to FPGAs to remove the CPU bottleneck in end2end DL workflows;
- Overlap gradient computing and error propagating by re-scheduling BP workflows when training NNs on the GPU.

BML: A scalable and high-performance DML system 2017.09 – 2018.01

- Re-design fine-grained data slicing and synchronizing paradigms to reduce the communication cost of DML;
- Build high-performance, parallel data communication primitives with codesign of RDMA and BCube topology;
- Outperform the PS and Ring paradigms by up to $2.4\times$ and $1.2\times$ end2end training throughput, respectively.

Virtual desktop management and control system 2015.01 – 2015.08

- Design a high-performance, cross-platform virtual desktop management system with the SPICE protocol;
- Implement tin-clients on Android and PC platforms, to interact with the VMs running on remote server;
- Design and implement SMx(2/3/4)-based encryption mechanism to protect user information from leakage

SELECTED PUBLICATIONS

- [1] **Yang Cheng**, Dan Li, Jing Zhu, Hongnan Liu, Kai Chen, and Jianping Wu, "Managing Multicast Membership for Software Defined Data Center Network", *the workshop of the IEEE 92nd Vehicular Technology Conference on New Network Architecture Powering Internet-of-Things, VTC2020-Fall (W10)*, Oct., 2020, Victoria, BC Canada.
- [2] Songtao Wang, Dan Li, **Yang Cheng**, Jinkun Geng, Yanshu Wang, Shuai Wang, Shutao Xia, and Jianping Wu, "BML: A Scalable, High-performance and Fault-tolerant Network Architecture for Distributed Machine Learning", *IEEE/ACM Transactions on Networking (ACM/IEEE ToN)*, 2020

- [3] Kaihui Gao, Dan Li, Li Chen, Jinkun Geng, Fei Gui, **Yang Cheng**, and Yue Gu, “Incorporating Intra-flow Dependencies and Inter-flow Correlations for Traffic Matrix Prediction”, *IEEE/ACM International Symposium on Quality of Service (ACM/IEEE IWQoS 2020)*, Jun., 2020, Hangzhou, China
- [4] Kaihui Gao, Dan Li, Li Chen, Jinkun Geng, Fei Gui, **Yang Cheng**, and Yue Gu, “Predicting Traffic Demand Matrix by Considering Inter-flow Correlations”, *the first IEEE INFOCOM Workshop on Networking Algorithms (WNA)*, Jul., 2020, Toronto, Canada.
- [5] **Yang Cheng**, Dan Li, Zhiyuan Guo, Binyao Jiang, Jiaxin Lin, Xi Fan, Jinkun Geng, Xinyi Yu, Wei Bai, Lei Qu, Ran Shu, Peng Cheng, Yongqiang Xiong, and Jianping Wu, “DLBooster: Boosting End-to-End Deep Learning Workflows with Offloading Data Preprocessing Pipelines”, *In Proceedings of the 48th International Conference on Parallel Processing (ICPP 2019)*, Aug., 2019, Tokyo, Japan.
- [6] Shuai Wang, Dan Li, Jinkun Geng, Yue Gu, and **Yang Cheng**, “Impact of Network Topology on the Performance of DML: Theoretical Analysis and Practical Factors”, *In IEEE INFOCOM 2019-IEEE Conference on Computer Communications (INFOCOM 2019)*, May, 2019, Paris, France.
- [7] Songtao Wang, Dan Li, **Yang Cheng**, Jinkun Geng, Yanshu Wang, Shuai Wang, Shutao Xia, and Jianping Wu, “BML: A High-performance, Low-cost Gradient Synchronization Algorithm for DML Training”, *In Thirty-second Advances in Neural Information Processing Systems (NeurIPS 2018)*, Dec., 2018, Montreal, Canada.
- [8] **Yang Cheng**, Jinkun Geng, Yanshu Wang, Junfeng Li, Dan Li, and Jianping Wu, “Bridging machine learning and computer network research: a survey”, *CCF Transactions on Networking (CCF ToN)*, 2018, 1(1-4): 1-15.
- [9] Zhetao Li, Fei Gui, Jinkun Geng, Dan Li, Zhibo Wang, Junfeng Li, **Yang Cheng**, and Usama Zafar, “Dante: Enabling FOV-Aware Adaptive FEC Coding for 360-Degree Video Streaming”, *In Proceedings of the 2nd Asia-Pacific Workshop on Networking (APNet 2018)*, Aug., 2018, Beijing, China.
- [10] Jinkun Geng, Dan Li, **Yang Cheng**, Shuai Wang, and Junfeng Li, “HiPS: Hierarchical Parameter Synchronization in Large-Scale Distributed Machine Learning”, *In Proceedings of the 2018 Workshop on Network Meets AI & ML (NetAI 2018)*, Aug., 2018, Budapest, Hungary.
- [11] Junfeng Li, Dan Li, Yukai Huang, **Yang Cheng**, and Ruilin Ling, “Quick NAT: High performance NAT system on commodity platforms”, *In 2017 IEEE International Symposium on Local and Metropolitan Area Networks (LANMAN 2017)*, Jun., 2017, Osaka, Japan.

SELECTED HONORS

Outstanding graduates in Sichuan province	Jun. 2016
Tang Lixin Scholarship, UESTC	Sep. 2015
National Scholarship	Sep. 2015
National Endeavor Scholarship	Sep. 2013
First prize, awarded on the 8 th National College Student Information Security Contest	Aug. 2015
First prize, awarded on the 6 th National College Students Mathematics Competition, Sichuan	Nov. 2014