Shih-Hao Tseng

(626) 709-6760 (Mobile)
shtseng@caltech.edu
shih-hao-tseng.github.io

Education

Cornell University (CU), Ithaca, NY, U.S.A. Aug. 2013 - Dec. 2018
PhD in Electrical and Computer Engineering (Advisor: Dr. A. Tang)
- Dissertation: Orchestrating Inter-Datacenter Bulk Transfers with CodedBulk

National Taiwan University (NTU), Taipei, Taiwan Sept. 2008 - June 2012
Bachelor of Science in Engineering (minor in Economics)
- GPA: 92.20/100.00; ranking 2nd in a class of 226

Research Interests

- Networked systems, in-network processing, edge computing, Internet of Things, scheduling algorithms.
- Control theory, deployment architecture, controller synthesis, stability and optimization.
- Network simulation and emulation, controller performance evaluation.

Selected Publications

- **S.-H. Tseng**, "Realization, Internal Stability, and Controller Synthesis," in *Proc. IEEE ACC*, 2021.
- **S.-H. Tseng**, S. Agarwal, R. Agarwal, H. Ballani, and A. Tang, "CodedBulk: Inter-Datacenter Bulk Transfers using Network Coding," in *Proc. USENIX NSDI*, 2021.
- **S.-H. Tseng** and J. Anderson, "Deployment Architectures for Cyber-Physical Control Systems," in *Proc. IEEE ACC*, 2020.
- **S.-H. Tseng**, A. Tang, G. Choudury, and S. Tse, "Routing Stability in Hybrid Software-Defined Networks," in *IEEE/ACM Trans. Netw.*, 2019.
- **S.-H. Tseng**, "Perseverance-Aware Traffic Engineering in Rate-Adaptive Networks with Reconfiguration Delay," in *Proc. IEEE ICNP*, 2019.
- **S.-H. Tseng**, B. Bai, and J. C. S. Lui, "Hybrid Circuit/Packet Network Scheduling with Multiple Composite Paths," in *Proc. IEEE INFOCOM*, 2018.
- **S.-H. Tseng**, E. Bitar, and A. Tang, "Random Convex Approximations of Ambiguous Chance Constrained Programs," in *Proc. IEEE CDC*, 2016.
- A. Gushchin, **S.-H. Tseng**, and A. Tang, "Optimization-Based Network Flow Deadline Scheduling," in *Proc. IEEE ICNP*, 2016.

Experience

Meta Platforms, Inc., Menlo Park, CA, U.S.A. Dec. 2021 - Present
Research Scientist

California Institute of Technology, Pasadena, CA, U.S.A. Oct. 2018 - Oct. 2021
Postdoctoral Scholar Research Associate
- Led the project of freshness-driven network control.
- Mentored graduate students on parallel model predictive control and formal test-case generation.
- Derived realization-stability lemma that unifies existing controller synthesis methods.
- Investigated the controller deployment architecture for cyber-physical systems.
- Developed efficient computation technique via dynamic programming and flexible Python framework for system level synthesis.

Cornell University, Ithaca, NY, U.S.A. Aug. 2014 - Aug. 2018
Graduate Research Assistant/Teaching Assistant
- Built CodedBulk to boost the throughput of inter-datacenter bulk transfers using network coding.
- Studied time-aware network management under software-defined networking.
- Helped teach Introduction to Probability and Inference for Random Signals and Systems.

The Chinese University of Hong Kong, Shatin, NT, Hong Kong June 2017 - Aug. 2017
Research Assistant
- Developed efficient scheduling algorithms for hybrid packet/circuit networks.

AT&T, Middletown, NJ, U.S.A. June 2016 - Aug. 2016
Student Intern - Technical II
- Developed routing algorithms to stabilize carrier-grade hybrid software-defined networks.

Skills

Programming Languages: Proficient in C, C++, Python and Verilog.
Programming Skills: Working knowledge of Linux based C++ socket, kernel scheduler, GPU parallelization, and multithreaded programming.
Simulation Tools: Proficient in control system (MATLAB) and network simulations (NS-3).
Languages: Fluent in English; native in Mandarin Chinese and Taiwanese Hokkien.

Honors and Awards

Winner of the AT&T SDN Network Design Challenge 2016
- Awarded to the top team providing the most efficient and cost effective routing solution to carrier-grade networks.

Jacobs Fellowship (CU) 2014
Studying Abroad Scholarship (Ministry of Education, Taiwan(R.O.C.)) 2013
Honorary Member of the Phi Tau Phi Scholastic Honor Society 2012
- Presented to seniors from each college in Taiwan ranking within top 1% of their department.

President's Awards (NTU) 2009, 2010, 2011, 2012
- Four-time recipient; awarded to students ranking within top 5% of their department.

Outstanding Project Award 2011
- Awarded to the top 10 teams of Cross-Strait Finals of 2011 Innovate Asia Competition (FPGA design).