# Shih-Hao Tseng

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## 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 Tra c 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
- Lead intent-based networking (IBN).
- Developed centralized path-selection (CPS), in-house hybrid routing solution.

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 e cient 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 e cient 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 e cient and cost e ective 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).