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)
- Relevant Coursework:
  Practicum in Operating Systems, Advanced Computer Networking, Approximation Algorithm, Convex Analysis, Functional Analysis, Statistical Inference and Decision, Stochastic Systems: Estimation and Control.

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

Software-Defined Networking
- Centralized control, congestion-free routing, and high-frequency network updating.

Cyber-Physical System
- Network dynamic model, deployment architecture, stability, optimization theory, and algorithm.

Experience

California Institute of Technology, Pasadena, CA, U.S.A. Oct. 2018 - Present
Posdoctoral Scholar
- Lead the project of freshness-driven network control.
- Developed generic solver for unconstrained control problems.
- Investigated perseverance-aware rate-adaptive networks.

Cornell University, Ithaca, NY, U.S.A. Aug. 2014 - Aug. 2018
Graduate Research Assistant/Teaching Assistant
- Developed a virtual SDN test framework to verify congestion-free updating properties.
- Simulated optimization-based flow deadline scheduling policies under SDN in NS-3.
- 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 models and designed algorithms for hybrid software-defined networks.

Skills

Programming Languages: Proficient in C++, Python and Verilog; working knowledge of ActionScript, C, Basic, HTML, Java, JavaScript, MySQL, and PHP.
Programming Skills: Working knowledge of linux based C++ socket and multithreaded programming.
Simulation Tools: Proficient in PSpice, MATLAB, and NS-3.
Languages: Fluent in English; native in Mandarin Chinese and Taiwanese Hokkien; basic understanding of Cantonese, French, German, Spanish, and Japanese.

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 method.

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).

Freshman Chinese Writing Award (NTU) 2009

Book

[b1] A. Tang and **S.-H. Tseng**, *Traffic Management in Computer Networks: A Systems Approach.*

Journal Articles

[j1] **S.-H. Tseng** and J. Anderson, "Deployment Architectures for Cyber-Physical Control Systems," in submission to *IEEE Trans. Control. Netw. Syst.*.

[j2] **S.-H. Tseng**, A. Tang, G. Choudury, and S. Tse, "Routing Stability in Hybrid Software-Defined Networks," in *IEEE/ACM Trans. Netw.*, 2019.

Conference Papers

[c1] **S.-H. Tseng**, "Realization, Internal Stability, and Controller Synthesis," submitted to IEEE ACC 2021.

[c2] **S.-H. Tseng** and J. S. Li, "SLSpy: Python-Based System-Level Controller Synthesis Framework," submitted to IEEE ACC 2021.

[c3] **S.-H. Tseng**, S. Han, and A. Wierman, "In-Network Freshness Control: Trading Throughput for Freshness," submitted to ACM SIGMETRICS 2021.

[c4] **S.-H. Tseng**, S. Agarwal, R. Agarwal, H. Ballani, and A. Tang, "Inter-Datacenter Bulk Transfers with Coded-Bulk," submitted to USENIX NSDI 2021.

[c5] **S.-H. Tseng**, C. Amo Alonso, and S. Han, "System Level Synthesis via Dynamic Programming," in *Proc. IEEE CDC*, 2020.

[c6] J. S. L. Li and **S.-H. Tseng**, "SLS-MATLAB Toolbox: Do-It-Yourself System Level Synthesis [Poster]," in *Proc. IEEE ACC*, 2020.

[c7] **S.-H. Tseng** and J. Anderson, "Deployment Architectures for Cyber-Physical Control Systems," in *Proc. IEEE ACC*, 2020.

[c8] **S.-H. Tseng**, "A Generic Solver for Unconstrained Control Problems with Integral Functional Objectives," in *Proc. IEEE ACC*, 2020.

[c9] **S.-H. Tseng**, "Perseverance-Aware Traffic Engineering in Rate-Adaptive Networks with Reconfiguration Delay," in *Proc. IEEE ICNP*, 2019.

[c10] J. Cheng, **S.-H. Tseng**, and A. Tang, "Worst-Case Latency Performance of Load Balancing Through Distributed Waterfilling Algorithm," in *Proc. CISS*, 2019.

[c11] N. Wu, **S.-H. Tseng**, and A. Tang, "Accurate Rate-Aware Flow-Level Traffic Splitting," in *Proc. Allerton*, 2018.

[c12] **S.-H. Tseng** and A. Tang, "Coflow Deadline Scheduling via Network-Aware Optimization," in *Proc. Allerton*, 2018.

[c13] **S.-H. Tseng**, B. Bai, and J. C. S. Lui, "Hybrid Circuit/Packet Network Scheduling with Multiple Composite Paths," in *Proc. IEEE INFOCOM*, 2018.

[c14] **S.-H. Tseng** and A. Tang, "A Local Search Algorithm for the Witsenhausen's Counterexample," in *Proc. IEEE CDC*, 2017.

[c15] **S.-H. Tseng**, E. Bitar, and A. Tang, "Random Convex Approximations of Ambiguous Chance Constrained Programs," in *Proc. IEEE CDC*, 2016.

[c16] A. Gushchin, **S.-H. Tseng**, and A. Tang, "Optimization-Based Network Flow Deadline Scheduling," in *Proc. IEEE ICNP*, 2016.

[c17] **S.-H. Tseng**, C. L. Lim, N. Wu, and A. Tang, "Time-Aware Congestion-Free Routing Reconfiguration," in *Proc. IFIP Networking*, 2016.

[c18] **S.-H. Tseng**, "Part-Time Emulation of Network Applications via Simulated Links," in preparation.

[c19] **S.-H. Tseng**, "Network-Calculus-Based Upper Bounds on Age of Information," in preparation.