

# SHIH-HAO TSENG

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## EDUCATION

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| <b>Cornell University (CU)</b> , Ithaca, NY, U.S.A.<br><i>PhD in Electrical and Computer Engineering (Advisor: Dr. Kevin Tang)</i> <ul style="list-style-type: none"><li>Relevant Coursework:<br/>Practicum in Operating Systems, Advanced Computer Networking, Approximation Algorithm, Convex Analysis, Functional Analysis, Statistical Inference and Decision, Stochastic Systems: Estimation and Control.</li></ul> | Aug. 2013 - Dec. 2018  |
| <b>National Taiwan University (NTU)</b> , Taipei, Taiwan<br><i>Bachelor of Science in Engineering (minor in Economics)</i> <ul style="list-style-type: none"><li>GPA: 92.20/100.00; ranking 2<sup>nd</sup> in a class of 226</li></ul>   | Sept. 2008 - June 2012 |

## RESEARCH INTERESTS

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- 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

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| <b>California Institute of Technology</b> , Pasadena, CA, U.S.A.<br><i>Postdoctoral Scholar</i> <ul style="list-style-type: none"><li>Lead the project of freshness-driven network control.</li><li>Developed generic solver for unconstrained control problems.</li><li>Investigated perseverance-aware rate-adaptive networks.</li></ul>   | Oct. 2018 - Present   |
| <b>Cornell University</b> , Ithaca, NY, U.S.A.<br><i>Graduate Research Assistant/Teaching Assistant</i> <ul style="list-style-type: none"><li>Developed a virtual SDN test framework to verify congestion-free updating properties.</li><li>Simulated optimization-based flow deadline scheduling policies under SDN in NS-3.</li><li>Helped teach Introduction to Probability and Inference for Random Signals and Systems.</li></ul> | Aug. 2014 - Aug. 2018 |
| <b>The Chinese University of Hong Kong</b> , Shatin, NT, Hong Kong<br><i>Research Assistant</i> <ul style="list-style-type: none"><li>Developed efficient scheduling algorithms for hybrid packet/circuit networks.</li></ul>  | June 2017 - Aug. 2017 |
| <b>AT&amp;T</b> , Middletown, NJ, U.S.A.<br><i>Student Intern - Technical II</i> <ul style="list-style-type: none"><li>Developed models and designed algorithms for hybrid software-defined networks.</li></ul>  | June 2016 - Aug. 2016 |

## SKILLS

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**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

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| <b>Winner of the AT&amp;T SDN Network Design Challenge</b> <ul style="list-style-type: none"><li>Awarded to the top team providing the most efficient and cost effective routing method.</li></ul>             | 2016                   |
| <b>Jacobs Fellowship (CU)</b>  | 2014                   |
| <b>Studying Abroad Scholarship (Ministry of Education, Taiwan(R.O.C.))</b>   | 2013                   |
| <b>Honorary Member of the Phi Tau Phi Scholastic Honor Society</b> <ul style="list-style-type: none"><li>Presented to seniors from each college in Taiwan ranking within top 1% of their department.</li></ul> | 2012                   |
| <b>President's Awards (NTU)</b> <ul style="list-style-type: none"><li>Four-time recipient; awarded to students ranking within top 5% of their department.</li></ul>  | 2009, 2010, 2011, 2012 |
| <b>Outstanding Project Award</b> <ul style="list-style-type: none"><li>Awarded to the top 10 teams of Cross-Strait Finals of 2011 Innovate Asia Competition (FPGA design).</li></ul>                           | 2011                   |
| <b>Freshman Chinese Writing Award (NTU)</b>  | 2009                   |

## PUBLICATIONS

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- S.-H. Tseng**, C. Amo Alonso, and S. Han,  
“System Level Synthesis via Dynamic Programming,” in *Proc. IEEE CDC*, 2020.
- J. S. L. Li and **S.-H. Tseng**,  
“SLS-MATLAB Toolbox: Do-It-Yourself System Level Synthesis [Poster],” in *Proc. IEEE ACC*, 2020.
- S.-H. Tseng** and J. Anderson,  
“Deployment Architectures for Cyber-Physical Control Systems,” in *Proc. IEEE ACC*, 2020.
- S.-H. Tseng**,  
“A Generic Solver for Unconstrained Control Problems with Integral Functional Objectives,” 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.
- J. Cheng, **S.-H. Tseng**, and A. Tang,  
“Worst-Case Latency Performance of Load Balancing Through Distributed Waterfilling Algorithm,” in *Proc. CISS*, 2019.
- N. Wu, **S.-H. Tseng**, and A. Tang,  
“Accurate Rate-Aware Flow-Level Traffic Splitting,” in *Proc. Allerton*, 2018.
- S.-H. Tseng** and A. Tang,  
“Coflow Deadline Scheduling via Network-Aware Optimization,” in *Proc. Allerton*, 2018.
- 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** and A. Tang,  
“A Local Search Algorithm for the Witsenhausen’s Counterexample,” in *Proc. IEEE CDC*, 2017.
- 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.
- S.-H. Tseng**, C. L. Lim, N. Wu, and A. Tang,  
“Time-Aware Congestion-Free Routing Reconfiguration,” in *Proc. IFIP Networking*, 2016.
- S.-H. Tseng**,  
“Part-Time Emulation of Network Applications via Simulated Links,” submitted for review.
- S.-H. Tseng** and J. S. Li,  
“SLSpy: Python-Based System-Level Controller Synthesis Framework,” submitted for review.
- S.-H. Tseng**, S. Han, and A. Wierman,  
“In-Network Freshness Control: Trading Throughput for Freshness,” submitted for review.
- S.-H. Tseng**, S. Agarwal, R. Agarwal, H. Ballani, and A. Tang,  
“Inter-Datacenter Bulk Transfers with CodedBulk,” in preparation.
- S.-H. Tseng**,  
“Network-Calculus-Based Upper Bounds on Age of Information,” in preparation.