

# Luke Hsiao

SOFTWARE ENGINEER · SYSTEMS & NETWORKING

Remote · No visa sponsorship required to work in the US

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## Education

2015—2021	<b>Ph.D. in Electrical Engineering</b> , Stanford University	Stanford, CA
2015—2017	<b>M.S. in Electrical Engineering</b> , Stanford University	Stanford, CA
2010—2015	<b>B.S. in Computer Engineering</b> , Brigham Young University · <i>Summa Cum Laude</i>	Provo, UT

## Skills

<b>Programming</b>	Python, Rust, C, $\LaTeX$
<b>Areas</b>	Infrastructure, Systems, Networking, Backend, Cloud, DevOps

## Industry Experience

<b>Software Engineer</b>		Salt Lake City, UT
<small>NUMBERS STATION</small>		2021-11—Present
	<ul style="list-style-type: none"><li>Designing and building systems and infrastructure for a state-of-the-art ML platform.</li></ul>	
<b>Software Engineer</b>		Sunnyvale, CA
<small>GOOGLE</small>		2021-06—2021-11
	<ul style="list-style-type: none"><li>Led the TCP rebase effort for Project Icebreaker to help Google move towards the mainline Linux kernel.</li></ul>	
<b>Software Engineer Intern</b>		Sunnyvale, CA
<small>GOOGLE</small>		2020-06—2020-09
	<ul style="list-style-type: none"><li>Added support for TCP tx zerocopy (tx0cp) using io_uring in the Linux kernel.</li><li>Profiled and optimized benchmarks to demonstrate an 18% improvement in CPU efficiency for tx0cp via io_uring.</li></ul>	
<b>Research Intern</b>		New York, NY
<small>GOOGLE</small>		2019-06—2019-09
	<ul style="list-style-type: none"><li>Explored BBRv2 for many-to-one data center traffic, reducing latency and rtx rates by over 30% and 80%, respectively.</li><li>Open sourced Transperf, a transport protocol performance tool for testing TCP over emulated network scenarios.</li></ul>	
<b>Software Engineering Intern</b>		Santa Clara, CA
<small>NVIDIA</small>		2017-06—2017-09
	<ul style="list-style-type: none"><li>Worked with the drivers team to develop a new system-level Windows driver for gaming laptops.</li><li>Designed and implemented secure APIs in kernel-space C code.</li></ul>	

## Research Experience

<b>Ph.D. Research Assistant</b>		Stanford, CA
<small>STANFORD UNIVERSITY, Advisors: Phil Levis and Keith Winstein</small>		2015-09—2021-06
	<ul style="list-style-type: none"><li>Area: Systems and Networking</li><li>Saved ~80% network bandwidth by lowering latency to &lt;15 ms for foveated video compression.</li><li>Generated hardware component knowledge bases using training data generation and multitask learning.</li></ul>	
<b>Undergraduate Research Assistant</b>		Provo, UT
<small>BRIGHAM YOUNG UNIVERSITY, Advisor: Mike Wirthlin</small>		2014-04—2015-06
	<ul style="list-style-type: none"><li>Area: Embedded Systems, FPGA Reliability, Fault Injection</li><li>Assisted in validation and development of Xilinx V5QV fault injection infrastructure.</li><li>Designed and optimized VHDL components for use in FPGA reliability experiments.</li><li>Developed standalone JTAG fault injection system for radiation testing using C/C++.</li></ul>	

## Teaching Experience

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- W2019 **Graduate CA**, Introduction to Computer Networking (CS 144), Stanford University Stanford, CA  
W2016 **Graduate Grader**, Program Analysis and Optimizations (CS 243), Stanford University Stanford, CA  
W2014 **Undergraduate TA**, Data Structures and Algorithms (CS 235), Brigham Young University Provo, UT

## Publications

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### PEER-REVIEWED

- 2022 **Towards Retina-Quality VR Video Streaming: 15 ms Could Save You 80% of Your Bandwidth** ACM CCR  
L. Hsiao, B. Krajancich, P. Levis, G. Wetzstein, and K. Winstein  
[cs.stanford.edu/keithw/sigcomm-ccr-paper523.pdf](https://cs.stanford.edu/keithw/sigcomm-ccr-paper523.pdf) · [github.com/lukehhsiao/fvideo](https://github.com/lukehhsiao/fvideo)
- 2020 **Creating Hardware Component Knowledge Bases with Training Data Generation and Multi-task Learning** ACM TECS  
L. Hsiao, S. Wu, N. Chiang, C. Ré, and P. Levis  
[sing.stanford.edu/site/publications/tecs20hack.pdf](https://sing.stanford.edu/site/publications/tecs20hack.pdf) · [github.com/lukehhsiao/tecs-hardware-kbc](https://github.com/lukehhsiao/tecs-hardware-kbc)
- 2019 **Automating the Generation of Hardware Component Knowledge Bases** LCTES  
L. Hsiao, S. Wu, N. Chiang, C. Ré, and P. Levis  
[sing.stanford.edu/site/publications/hack-lctes19.pdf](https://sing.stanford.edu/site/publications/hack-lctes19.pdf) · [github.com/lukehhsiao/lctes-p27](https://github.com/lukehhsiao/lctes-p27)
- 2018 **Smart Contracts for Machine-to-Machine Communication: Possibilities and Limitations** IOTAIS  
Y. Hanada, L. Hsiao, and P. Levis  
[arxiv.org/abs/1806.00555](https://arxiv.org/abs/1806.00555)
- 2018 **Fonduer: Knowledge Base Construction from Richly Formatted Data** SIGMOD  
S. Wu, L. Hsiao, X. Cheng, B. Hancock, T. Rekatsinas, P. Levis, and C. Ré  
[sing.stanford.edu/site/publications/fonduer-sigmod18.pdf](https://sing.stanford.edu/site/publications/fonduer-sigmod18.pdf) · [github.com/HazyResearch/fonduer](https://github.com/HazyResearch/fonduer)
- 2015 **Estimating Soft Processor Soft Error Sensitivity through Fault Injection** FCCM  
N. Harward, M. Gardiner, L. Hsiao, and M. Wirthlin  
[ieeexplore.ieee.org/xpl/articleDetails.jsp?arnumber=7160058](https://ieeexplore.ieee.org/xpl/articleDetails.jsp?arnumber=7160058)
- 2014 **A Fault Injection System for Measuring Soft Processor Design Sensitivity on Virtex-5 FPGAs** FASA  
N. Harward, M. Gardiner, L. Hsiao, and M. Wirthlin  
[link.springer.com/chapter/10.1007%2F978-3-319-14352-1\\_5](https://link.springer.com/chapter/10.1007%2F978-3-319-14352-1_5)

### PRE-PRINTS

- 2019 **The Price of Free Illegal Live Streaming Services** arXiv  
H. Ayers and L. Hsiao  
[arxiv.org/abs/1901.00579](https://arxiv.org/abs/1901.00579)
- 2016 **TCPTuner: Congestion Control Your Way** arXiv  
K. Miller and L. Hsiao  
[arxiv.org/abs/1605.01987](https://arxiv.org/abs/1605.01987) · [github.com/Gasparila/TCPTuner](https://github.com/Gasparila/TCPTuner)