

Luke Hsiao

SOFTWARE ENGINEER · SYSTEMS & NETWORKING

Remote · No visa sponsorship required to work in the US

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Education

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

Skills

Programming Python, Rust, C, \LaTeX
Areas Infrastructure, Systems, Networking, Backend, Cloud, DevOps

Industry Experience

Software Engineer *Menlo Park, CA*
NUMBERS STATION *2021-11—Present*

- Designing and building systems and infrastructure for a state-of-the-art ML platform.

Software Engineer *Sunnyvale, CA*
GOOGLE *2021-06—2021-11*

- Led the TCP rebase effort for Project Icebreaker to help Google move towards the mainline Linux kernel.

Software Engineer Intern *Sunnyvale, CA*
GOOGLE *2020-06—2020-09*

- Added support for TCP tx zerocopy (tx0cp) using io_uring in the Linux kernel.
- Profiled and optimized benchmarks to demonstrate an 18% improvement in CPU efficiency for tx0cp via io_uring.

Research Intern *New York, NY*
GOOGLE *2019-06—2019-09*

- Explored BBRv2 for many-to-one data center traffic, reducing latency and rtx rates by over 30% and 80%, respectively.
- Open sourced Transperf, a transport protocol performance tool for testing TCP over emulated network scenarios.

Software Engineering Intern *Santa Clara, CA*
NVIDIA *2017-06—2017-09*

- Worked with the drivers team to develop a new system-level Windows driver for gaming laptops.
- Designed and implemented secure APIs in kernel-space C code.

Research Experience

Ph.D. Research Assistant *Stanford, CA*
STANFORD UNIVERSITY, Advisors: Phil Levis and Keith Winstein *2015-09—2021-06*

- Area: Systems and Networking
- Saved ~80% network bandwidth by lowering latency to <15 ms for foveated video compression.
- Generated hardware component knowledge bases using training data generation and multitask learning.

Undergraduate Research Assistant *Provo, UT*
BRIGHAM YOUNG UNIVERSITY, Advisor: Mike Wirthlin *2014-04—2015-06*

- Area: Embedded Systems, FPGA Reliability, Fault Injection
- Assisted in validation and development of Xilinx V5QV fault injection infrastructure.
- Designed and optimized VHDL components for use in FPGA reliability experiments.
- Developed standalone JTAG fault injection system for radiation testing using C/C++.

Teaching Experience

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

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](#) · [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](#) · [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](#) · [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](#)
- 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](#) · [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](#)
- 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](#)

PRE-PRINTS

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