Sen Lin

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RESEARCH STATEMENT

My research centers on *multidimensional* network traffic optimization, with an emphasis on enhancing end-user experience in **media streaming** and **data center networks**. I design and develop protocols and systems that aim to optimize network performance holistically.

EDUCATION

Northwestern University, Evanston, IL — 2020–2025 (expected)

- **Ph.D.** in Computer Science, GPA: **3.95/4.0**
- Areas: Computer Networks and Systems
- Advisor: Prof. Aleksandar Kuzmanovic.

University at Buffalo, Buffalo, NY — 2018–2020

- **M.Sc.** in Computer Science & Engineering, GPA: **3.89/4.0**
- Advisor: Prof. Lu Su.

Yunnan University, Kunming, P.R.China — 2014–2018

- **B.Eng.** in Software Engineering, GPA: **3.4/4.0**

RESEARCH EXPERIENCE

Dolby Laboratories — 2024
PhD Research Intern, Manager: Dr. Jason Cloud
- Forward Error Reallocation in Real-Time Streaming (Under development)

Northwestern University — 2020–Present
Research Assistant, Advisor: Prof. Aleksandar Kuzmanovic
- Exploiting Traffic Diversity in Metaverse Streaming (Under development)
  - Multidimensional media streaming optimization
- Optimizing Traffic in Public-Facing Data Centers Amid Internet Protocols [C1, P1]
  - We propose a versatile optimization signal carrier embedded within Internet protocols, establishing an in-bound communication channel to facilitate various data center advances in optimizing public-facing traffic, with zero client-side modifications.
- Accelerating and Securing Serverless Cloud Networks with QUIC (Joint work with Northwestern LIST) [C3, P2, Code]
  - We propose a general network-centric model for serverless computing to identify potential bottlenecks.
  - To mitigate such bottlenecks, we propose to integrate QUIC into serverless computing. This design does not require any modification to the tenant code.
- Snatch: Streaming Analytics at the Network Edge [C2]
  - We propose a system that enhances user privacy and accelerates online streaming analytics by breaking the current arrangement and leveraging semantic cookies.

University at Buffalo — 2018–2020
Graduate Student, Advisor: Prof. Lu Su
- 3D Human Pose Construction Using WiFi [C4, Demo video]
  - We propose to use the pervasive WiFi architecture to image the human body like cameras while overcoming their issues.
  - Our model incorporates the prior knowledge of human skeleton in the posture construction process, which ensures the realisticness of the generated posture and achieves a 35% improvement in accuracy.

Yunnan University 2017–2018
Undergraduate Student, Advisor: Prof. Yun Yang

Institute of Software, Chinese Academy of Science 2016
Research Intern, Advisor: Prof. Xue Chen

REFEREED
PUBLICATIONS

Conference Papers

C1 **Sen Lin**, Jianfeng Wang, Aleksandar Kuzmanovic
Optimizing Traffic in Public-Facing Data Centers Amid Internet Protocols
To appear in the 32nd IEEE International Conference on Network Protocols, Charleroi, Belgium, October 2024 **(ICNP'24)**

C2 Yunming Xiao, Yibo Zhao, **Sen Lin**, Aleksandar Kuzmanovic
Snatch: Online Streaming Analytics at the Network Edge
In the 19th European Conference on Computer Systems, Athens, Greece, April 2024 **(EuroSys'24)**

C3 Kaiyu Hou, **Sen Lin**, Yan Chen, Vinod Yegneswaran
QFaaS: Accelerating and Securing Serverless Cloud Networks with QUIC
In the 13th ACM Symposium on Cloud Computing, San Francisco, CA, November 2022 **(SoCC'22)**

C4 Wenjun Jiang, Hongfei Xue, Chenglin Miao, Shiyang Wang, **Sen Lin**, Chong Tian, Srinivasan Murali, Haochen Hu, Zhi Sun, Lu Su
Towards 3D Human Pose Construction Using WiFi
In the 26th ACM International Conference on Mobile Computing and Networking, London, UK (Virtual), September 2020 **(MobiCom'20)**

Posters

P1 **Sen Lin**, Jianfeng Wang, Aleksandar Kuzmanovic
Optimizing Traffic in Public-Facing Data Centers Amid Internet Protocols
In the 21st USENIX Symposium on Networked Systems Design and Implementation, Santa Clara, CA, 2024 **(NSDI'24)**

P2 Kaiyu Hou, **Sen Lin**, Yan Chen, Vinod Yegneswaran
Accelerating and Securing Serverless Cloud Networks with QUIC
In the 17th International Conference on Emerging Networking EXperiments and Technologies, Munich, Germany (Virtual), 2021 **(CoNEXT'21)**

TALKS

• (SoCC'22) QFaaS: Accelerating and Securing Serverless Cloud Networks with QUIC, San Francisco

TEACHING
EXPERIENCE

Northwestern University 2021–Present
Teaching Assistant
• COMP_SCI 340: Introduction to Computer Networking (W'22, W'23, W'24)
Project Mentor
• COMP_SCI 397/497: Selected Topics in Computer Networks (S'22, S'23, S'24)

PROFESSIONAL
EXPERIENCE

Yunnan University Open Source Association 2017–2020
Co-funder, Core member
• @YNUOSA is one of the largest local open-source organization, where I lead various projects, including the CI/CD services and PaaS services, and host public technical workshops.

Yunnan University 2017
Software Engineer
• Develop the next-generation information systems for Yunnan University jointly with JiangSu Wisedu Information Technology Co.

SERVICES

• **Sub-Reviewer**: WWW (2021, 2022, 2023), ICDCS (2022)

Honors and Awards		
	• ***Student Travel Grant*** IEEE International Conference on Network Protocols (ICNP'24)	Sep 2024
	• ***Best Student Paper Award*** European Conference on Computer Systems (EuroSys'24)	Apr 2024
	• ***Conference Travel Grants*** Northwestern University	2021-2024
	• ***Peter and Adrienne Barris Outstanding Teaching Assistant Award*** Northwestern University	May 2023

Technical Skills		
	Programming:	Rust, Go, C/C++, Python, P4, MatLab, Ruby, Java, C#
	Platforms:	Linux/Unix, Android
	Techniques/Knowledge:	Linux Kernel (Networking Stack, Netfilter), DPDK, QUIC, DASH, VR Streaming (ALVR), Docker/Kubernets/DevOps/Serverless(OpenFaaS/AWS Lambda), PyTorch, Ruby on Rails, Database, J2EE, LaTeX