YUNMING XIAO

2233 Tech Drive
Seely Mudd, Room 3-416
Evanston, IL 60208

✉ yunming.xiao@u.northwestern.edu
☎ +1 (773)-273-0957
⌂ yunmingxiao.github.io

RESEARCH INTEREST

I am broadly interested in computer networks and distributed systems. My current work focuses on two categories: one is the network support for application-level cloud computing, and the other is the Internet-of-Things.

EDUCATION

Ph.D. Candidate, Computer Science   Sep 2019 - *Present*
Northwestern University, Evanston, IL
Advisor: *Prof. Aleksandar Kuzmanovic*

M.S., Computer Science   Aug 2021
Northwestern University, Evanston, IL

B.Eng., Computer Science   Sep 2015 - Jun 2019
Beijing University of Posts and Telecommunications, Beijing, China
GPA: 3.7/4.0 (87/100), Graduated With Honors

RESEARCH AND WORK EXPERIENCE

Northwestern University, USA   Sep 2019 - *Present*
Research Assistant, **Advisor:** *Prof. Aleksandar Kuzmanovic*

In-Network Application-Level Data-Streaming Analytics

- Proposed a system that accelerates the streaming analytics by leveraging transport level cookies and in-network computation

Low-Priority Endpoint-Controlled Bulk Transfers in Data-Center Networks

- Proposed an end-to-end protocol that achieves multi-priority flow scheduling to improve the overall network performance

Monetizing Spare Bandwidth: the Case of Distributed VPNs

- Performed the first systematic measurement study of the decentralized VPNs ecosystem focusing on the major players shedding lights on the performance, privacy and security issues
- Developed a DVPN manager system (RING) which simplifies the usability of DVPNs and provides security and privacy guarantees
- RING also provides automatic bandwidth and price control which optimize the income of DVPN node providers while improving the overall DVPN experience for the users

Decoding the Kodi Ecosystem

- Worked on De-Kodi, a system capable of crawling large cross-sections of Kodi's decentralized ecosystem
- Developed SafeKodi system which leverages the help of Kodi users to explore the Kodi ecosystem in the wild and, in return, offers information about potentially malicious add-ons to Kodi users.
- SafeKodi has received media coverage and is used by over 16k distinct users

Nokia Bell Labs, USA Jun - Sep 2021
Networking Research Intern, **Advisor:** *Dr. Matteo Varvello, Dr. T.V. Lakshman*

FIAT: Frictionless Authentication of IoT Traffic
- Built FIAT, a system that frictionlessly authorizes IoT traffic by learning recurring traffic and validating human actions behind less predictable traffic

Bytedance Inc., China Mar - Jul 2019
Infrastructure R&D Intern

- Implemented an efficient dependency solver for Cronjob and FaaS systems of Bytedance Cloud
- Implemented an alarm system with Message Queue and Kafka for Cronjob and FaaS systems
- Integrated the Cronjob and FaaS systems with the internal logging system and service billing system

Tsinghua University, China Mar 2018 - Mar 2019
Research Assistant, **Advisor:** *Prof. Wenfei Wu*

RLPlacer: A Deployment Model for Distributed Rate Limiting
- Proposed a heuristic algorithm for distributed rate limiting in the data center
- Designed and implemented the prototype of rate limiter on programmable switches with P4 language

King Abudullah University of Science and Technology, KSA Jul - Oct 2018
Visiting Student, **Advisor:** *Prof. Marco Canini*

Direct Nonlinear Acceleration
- Proposed an algorithm to accelerate fixed point iterations based on vector extrapolation techniques, which can be applied to speed up the neural network training
- Performed measurement on large scale cluster exploring the waste of the computing resources

Beijing University of Posts and Telecommunications, China Jul 2017 - Feb 2018
Research Assistant, **Advisor:** *Prof. Bin Wu, Prof. Jingyu Wang*

Transfer Learning on Traffic Classification
- Proposed a traffic classification algorithm that enables multitask traffic classification and performs well on transfer learning and one-shot learning scenarios

Study on Clustering in Evolutionary Game Theory
- Solved the fixation probability and fixation time of "death-birth" game model on a ring with a polynomial algorithm, and revealed the non-trivial role of clustering in mutant fixation

TEACHING EXPERIENCE

Northwestern University, USA Sep 2019 - *Present*
Teaching Assistant

COMP_SCI 110: Intro to Computer Programming – Fall 2020
COMP_SCI 340: Intro to Computer Networks – Winter 2022

PUBLICATIONS

Conference Publications

■ [2] Marc Anthony Warrior, **Yunming Xiao**, Matteo Varvello, Aleksandar Kuzmanovic:
De-Kodi: Understanding the Kodi Ecosystem.
In Proceedings of The Web Conference 2020 *(WWW'20)*, pp. 1171-1181.

■ [1] **Yunming Xiao**, Haifeng Sun, Zirui Zhuang, Jingyu Wang, Qi Qi:
Common Knowledge Based Transfer Learning For Traffic Classification.
IEEE 43rd Conference on Local Computer Networks *(LCN'18)*, pp. 311-314.

Journal Publications

[1] **Yunming Xiao**, Bin Wu:
Close spatial arrangement of mutants favors and disfavors fixation.
PLoS Computational Biology 15(9): e1007212. 2019. / arXiv: 1811.08718.

Refereed Posters

[2] **Yunming Xiao**, Matteo Varvello:
Poster: FIAT: Frictionless Authentication of IoT Traffic.
In Proceedings of *CoNEXT'21*.

[1] **Yunming Xiao**, Matteo Varvello, Aleksandar Kuzmanovic:
A First Look Into Distributed VPNs.
In Proceedings of the 21st ACM Internet Measurement Conference *(IMC'21)*.

Un-refereed & Working Papers

[5] **Yunming Xiao**, Iñigo Querejeta-Azurmendi, Matteo Varvello:
FIAT: Frictionless Authentication of IoT Traffic.
On Submission.

[4] **Yunming Xiao**, Matteo Varvello, Aleksandar Kuzmanovic:
Monetizing Spare Bandwidth: the Case of Distributed VPNs.
On Submission.

[3] **Yunming Xiao**, Matteo Varvello, Marc Anthony Warrior, Aleksandar Kuzmanovic:
Decoding the Kodi Ecosystem.
On Submission.

[2] **Yunming Xiao**, Sarit Markovich, Aleksandar Kuzmanovic:
Understanding Proof-of-Work Mining Pools
On Submission.

[1] Aritra Dutta, El Houcine Bergou, **Yunming Xiao**, Marco Canini, Peter Richtárik:
Direct Nonlinear Acceleration.
arXiv: 1905.11692. On Submission.

AWARDS AND HONORS

Distinguished Undergraduate Student in Beijing, 2019
Third Prize (Bronze Medal) of the 31st Chinese Physics Olympiad, 2014

SKILLS

Programming: C/C++, Python, Golang, Java, Javascript, Shell, SQL, HTML, P4, Assembly, LaTeX
Tools: Docker, Kubernetes, Scapy, CherryPy, Mininet, POX, PostgreSQL, QT, Git, PyTorch