Xiongwen GUO

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Education

School of Information | Renmin University of China, Beijing 2021.09 - Present

Major: Computer Science and Technology

GPA: 3.85/4.0, Major Rank: 3/65

Awards & Honors

Second Prize of Beijing City | CUMCM 2023.10

Second-Class Undergraduate Study Excellence Scholarship | RUC 2023.10

Second-Class Undergraduate Study Excellence Scholarship | RUC 2022.10

Papers

- Tong Li, Duling Xu, Bo Wu, **Xiongwen Guo**, Daijun Jiang, Cheng Luo, Wei Lu*, Xiaoyong Du: *Transmission in Wide-Area Deterministic Networking: A Survey.* (in Chinese) **Accepted by Journal of Software on June 5th, 2024. [to appear]**
- Guangmeng Zhou, **Xiongwen Guo**, Zhuotao Liu, Tong Li, Qi Li, Ke Xu*: *TrafficFormer: An Efficient Pre-trained Model for Traffic Data.* **Submitted to IEEE Symposium on Security and Privacy Conference (IEEE S&P) 2025.**
- Tong Li, Shangwen Jiang, Bo Wu*, Xu Yan, Cheng Luo, Fuyu Wang, Duling Xu, **Xiongwen Guo**, Zimeng Wang, Ke Xu: *When BBR Meets On-Off Traffic Patterns: Challenges and Future Directions.* **Submitted to IEEE Network Magazine.**

Technical Skills

- **Programming Languages:** Python (Proficient), C/C++ (Proficient), P4 (Moderate)
- **Research Tools:** ns-3 (Proficient), PyTorch (Proficient), LaTeX (Proficient)
- **Skill Achievements:** CET6 (score 554), CCF CSP (score 300)

Intern Experience

Research Intern | THU | **Advisor: Prof. Ke Xu** 2022.10 - 2024.05

Research Intern | RUC | **Advisor: Prof. Tong Li** 2022.09 - 2024.01

Teaching Assistant in Programming Training | RUC 2023.08

Project Experience

Utilizing ML/DL over Network Security | THUCSNET 2023.04 - 2024.05

- Analyzed and compared existing ML-based DDoS defense strategies on programmable switches and implemented a simple DDoS defense strategy on programmable switches using the P4 language.
- Processed network traffic datasets including ISCX-VPN, Cross-Platform(iOS), Cross-Platform(Android), CICMalAnal2017, CSTNET-TLS 1.3, USTC-TFC using tools including dpkt, SplitCap, tshark, etc.
- Processed protocol fields that cause learning shortcuts with random masking.
- Engaged in discussions on the innovations and optimizations of the pre-training model TrafficFormer (proposed by us) in terms of model structure and training tasks.
- Propose new data augmentation methods to improve model generalization ability.
- Propose new evaluation tasks to evaluate the protocol understanding ability of pre-training models.

- Utilized PyTorch to reproduce DL-based models including FS-Net, Deep Fingerprinting, GraphDApp in encrypted traffic classification tasks as baselines.
- Utilized PyTorch to reproduce pre-training models including ET-BERT, YaTC in encrypted traffic classification tasks and protocol understanding tasks as baselines.
- Wrote the corresponding sections of the paper and utilized LaTeX for part of the paper typesetting.
- **Project result**: Guangmeng Zhou, **Xiongwen Guo**, Zhuotao Liu, Tong Li, Qi Li, Ke Xu*: *Traffic-Former: An Efficient Pre-trained Model for Traffic Data*. Submitted to IEEE Symposium on Security and Privacy (IEEE S&P Conference) 2025.

Survey on Deterministic Networking | LitongLab 2022.12 - 2024.01

- Researched and summarized new applications scenarios of wide-area deterministic networks (including cross-domain DBMS, real-time communication, etc.).
- Researched and analyzed the feasibility and limitations of existing networking optimization methods (including FEC, ABR, etc.) in achieving deterministic transmission in WAN.
- Researched clean-slate deterministic network architectures including Deterministic IP (DIP) proposed by Huawei and Enhanced Deterministic Network (EDN) proposed by ZTE.
- Wrote the corresponding sections and plotted the corresponding figures of the paper.
- **Project result**: Tong Li, Duling Xu, Bo Wu, **Xiongwen Guo**, Daijun Jiang, Cheng Luo, Wei Lu*, Xiaoyong Du: *Transmission in Wide-Area Deterministic Networking: A Survey*. (in Chinese) Accepted by Journal of Software on June 5th, 2024. [to appear]

Utilizing BBR over Real-time Communication | LitongLab 2023.09 - 2024.02

- Engaged in discussions on the limitations of BBR algorithm in real-time audio and video streams.
- Participated in analyzing and discussing the contradictions between BBR algorithm and the On-Off Pattern in real-time audio and video streams.
- Researched and summarized the improvements of BBRv2 and BBRv3 over BBRv1.
- Wrote the corresponding sections and plotted the corresponding figures of the paper.
- **Project result**: Tong Li, Shangwen Jiang, Bo Wu*, Xu Yan, Cheng Luo, Fuyu Wang, Duling Xu, **Xiongwen Guo**, Zimeng Wang, Ke Xu: *When BBR Meets On-Off Traffic Patterns: Challenges and Future Directions*. Submitted to IEEE Network Magazine.

Grand Challenge on Multi-site Parallel Downloading 2023.03 - 2023.04

- Contest website: https://2023.acmmmsys.org/participation/challenges/
- Led the team FluxPilot to design and implement a re-injection strategy based on video playback buffer.
- Codes are available at https://github.com/xiongwenguo/MMSys_FluxPilot.

Other projects on related courses

- Courses include Operating System, Parallel and Distributed Computing, Principles of Compilers, etc.
- Project repositories are available at https://github.com/xiongwenguo/.