Weiran Wang

Isafjordsgatan 10, 16440, Kista, Stockholm, Sweden

+46 72-844-0246 | weiranw@kth.se | wangweiran0129.github.io | github.com/wangweiran0129

Research Interests

My research interests straddle the complex domain of networked systems and their interdisciplinary interfaces. On the one hand, I am interested in the network performance, network calculus, and virtualization that underpin the essence of internetworking. On the other hand, I am willing to delve into the interconnected areas of distributed systems, machine learning, queuing theory and game theory, highlighting the convergence of these disciplines with networked systems. Currently, I am channeling my problem-solving skills into refining the quality metrics of uplink control plane of 5G baseband products at Ericsson in Stockholm, Sweden.

Education

KTH Royal Institute of Technology *Stockholm, Sweden*

M.Sc., in ICT Innovation - track Cloud and Network Infrastructures *Aug. 2020 - Mar. 2023*

- **GPA**: 4.56/5, **Main Courses**: Advanced Internetworking, Queuing Theory and Teletraffic Systems, Advanced Distributed Systems, etc.
- **Master Thesis**: "Analysis of Flow Prolongation Using GNN in FIFO Multiplexing System"
- **Advisors**: Prof. Jean-Yves Le Boudec (EPFL), Prof. Viktoria Fodor (KTH) and Dr. Hossein Tabatabaee (EPFL)

École polytechnique fédérale de Lausanne (EPFL) *Lausanne, Switzerland*

Exchange in the School of Computer and Communication Sciences *Sep. 2021 - Aug. 2022*

- **GPA**: 5.26/6, **Main Courses**: Machine Learning, TCP/IP Networking, Network Calculus, etc.
- Semester and Degree Project done in Laboratory for Communications and Applications 2
- **Advisors**: Prof. Jean-Yves Le Boudec and Dr. Hossein Tabatabaee

Dalian University of Technology *Dalian, China*

B.Sc., in Software Engineering *Sep. 2016 - Jun. 2020*

- **GPA**: 85.7/100, **Main Courses**: Mathematics, Computer Network, Computer Organization and Structure, Database System, etc.
- **Bachelor Thesis**: "The Research on Virtual Function Scheduling of Edge Network Based on Game Theory"
- **Advisors**: Prof. Zichuan Xu and Dr. Qiufen Xia

Research Projects

Analysis of Flow Prolongation Using GNN in FIFO Multiplexing System *Lausanne, Switzerland*

École polytechnique fédérale de Lausanne (EPFL) *Mar. 2022 - Dec. 2022*

- Reproduced the GNN model based on PMOO and achieved an accuracy of 65% compared to 69.6% in the reference paper.
- Integrated the NetCal/DNC into topologies so that delay bounds can be calculated automatically once new networks are generated.
- Generated a novel dataset comprising over 160,000 topologies, each with the average of 25 servers and 115 flows, which was used for the adversarial attack purpose to simulate the network disturbance and jitter.
- Implemented FGSM attack to the network topologies with flow prolongations predicted by GNN.

Flow Analysis on GNN-Oriented Flow Prolongation *Lausanne, Switzerland*

École polytechnique fédérale de Lausanne (EPFL) *Oct. 2021 - Feb. 2022*

- Investigated the usage of NetCal/DNC with network topologies settings to compute the delay bound of the flow of interest.
- Investigated the usage of GNN to predict flow prolongations in new network topologies (trained GNN based on LUDB and PMOO).
- Analyzed the tightness of delay bounds and benchmarked the execution time computed by LUDB-FF, PMOO, TFA and SFA with PLP in source-sink tandem networks.

The Research on Virtual Function Scheduling of Edge Network on Game Theory *Dalian, China*

Dalian University of Technology *Dec. 2019 - Jun. 2020*

- Realized a decentralized coalition algorithm based on *Gale-Shapley algorithm* to minimize the total latency of VNF scheduling.
- Proved Nash Equilibrium in the algorithm framework and bolstered the robustness of VNF service chains allocation.
- Compared with the existing *Genetic Algorithm* and *Round-robin Scheduling Algorithm*, and the results showed better scheduling time.

Industrial Experience

Ericsson *Stockholm, Sweden*

5G Baseband Software Developer *Sep. 2022 - Present*

- Serving on the Module Product Care for User Plane Control Uplink, aiming to enhance the robustness of 5G baseband source code.
- Developed a framework for Software Quality Indications to systematically track quality improvement initiatives.
- Improved code quality and identified potential bugs by using static and dynamic code analysis tools.
- Worked with feature development in my domain including testing activities.

Ericsson *Stockholm, Sweden*

Summer Internship R&D *Jun. 2021 - Aug. 2021*

- Developed a tool to automatically check Ericsson code disclaimers of the created and last-modified dates form the git log.
- Extracted and compared real-time Baseband Uplink Products data with test use cases, and visualized data on Ericsson developer website.
- Experimented with the FOSS 'Include What You Use' with the Ericsson compiler to enable support for Ericsson's proprietary code.

Selected Awards

2022	KTH Erasmus+ Scholarship
2021	EPFL Swiss-European Mobility Program (SEMP) Scholarship
2021	KTH Covid-19 Financial Aid Scholarship Based on Academic Excellence
2020	Distinguished Undergraduate of Dalian City
2020	Outstanding Undergraduate Thesis of Dalian University of Technology
2019	Outstanding Position Paper in UNIDO of National Model United Nations New York Conference
2019	Honorable Mention Delegation Award of National Model United Nations New York Conference
2018	Outstanding Youth League Member of Dalian University of Technology

Skills

Programmings	advanced: Python; proficient: JavaScript/HTML/CSS, Java, Scala, C/C++; have experience: TLA+, Go.
Tools	PyTorch, Hadoop, Spark, jQuery, Ajax, Elasticsearch, DPDK, Kubernetes.
Miscellaneous	Linux, Shell (Bash/Zsh), Clang, CMake, Bazel, LLVM, Git, CI/CD, Jenkins, LaTeX.
Languages	English (Proficient), Chinese (Native), Japanese (Intermediate), French (Elementary), Swedish (Elementary).
Extracurricular	Living and studying in Europe, I've embraced diverse skills. I annually ski in the Swiss Alps and dive in the Mediterranean with an open water diving certificate. Being an amateur photographer is my hobby and my gallery can be found here. Moreover, motivated by my European roommates, I've started exploring various cuisines and honing my culinary skills (photos available here). During my undergraduate years, I actively participated in United Nations events. Notably, in 2018, I was a student delegate at the 9th University Scholars Leadership Symposium in the United Nations Economic and Social Commission for Asia and the Pacific, in Bangkok, Thailand. The following year, I represented my university at the National Model United Nations Conference in New York, USA.