Weiran Wang

Isafjordsgatan 10, 16440, Stockholm, Sweden

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

Research Interests

After earning an M.Sc. from KTH Royal Institute of Technology in 2023, I transitioned into the role of a 5G Baseband Software Developer at Ericsson. My research interests straddle the complex domain of internetworking systems and its interdisciplinary interfaces. On one hand, I am interested in Network Function Virtualization, Network Calculus, and Wireless Communication that underpin the essence of internetworking. On the other hand, I delve into the interconnected areas with Distributed Systems, Machine Learning, and Game Theory, highlighting the convergence of these disciplines with network systems. Currently, I am channeling my problem-solving skills into refining Uplink Carrier Aggregation through the creation of a robust software quality indications framework.

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 accuray 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.
- 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*, and proved the existence of Nash Equilibrium in the problem of minimizing total latency for VNF scheduling.
- Simulated the experiment, and the results showed a better scheduling completion time compared with the existing *Genetic Algorithm* and *Round-robin Scheduling Algorithm*.

Industrial Experience

Ericsson *Stockholm, Sweden*
5G Baseband Software Developer *Sep. 2022 - Present*

- Served on the Module Product Care for Uplink, aiming to enhance the robustness and predictability of baseband source code.
- Developing a Software Quality Indications Framework dashboard to systematically track quality improvement initiatives.
- Productified the 'Include What You Use (IWYU)' to Clang 15 within Ericsson compilers and configured the custom IWYU parser for inclusions suggestions.
- Improved code quality and identified potential bugs by using CodeChecker.
- Developed a tool to extract checkers from both global and local control elements' configuration files, read the merge mode from the profile file, and deliver the final checker settings.

Ericsson *Stockholm, Sweden*
Summer Intern 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.
- Built 'Include What You Use (IWYU)' with the Ericsson compiler to enable support for Ericsson's proprietary code. Later, leveraged IWYU to replace compiler innovations for code header inclusion checks.

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 Graduate 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	Python (advanced), JavaScript/HTML/CSS (proficient), Java (proficient), Scala (proficient), C/C++ (proficient), TLA+ (have experienced), Go (have experienced).
Tools	PyTorch, Hadoop, Spark, LLVM, CMake, Clang, jQuery, Ajax, Elasticsearch, DPDK, Kubernetes.
Miscellaneous	Linux, Shell (Bash/Zsh), Bazel, 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.