Alireza Farshin

Networked System Researcher

kth.se/profile/farshin

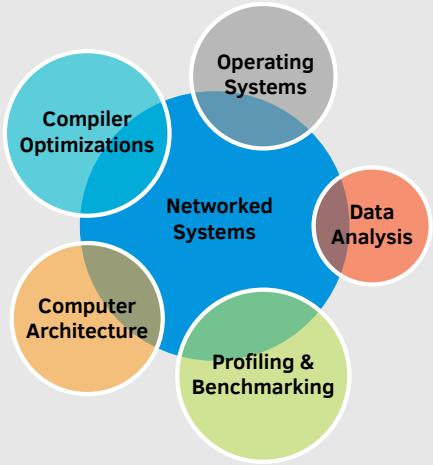
farshin@kth.se

alireza-farshin

Google Scholar

aliireza

Technical Skills Overview



Programming & Tools

Linux • Shell Scripting • C • C++

DPDK • FastClick • Perf • LLVM

Git • Gnuplot • LaTeX

Python • MATLAB • R

TensorFlow • Spark • Pandas

Education

PhD., Information Communication Technology
Specialization: Communication Systems
School of EECS
KTH Royal Institute of Technology
2017 - 2023 (Q1) | Stockholm, Sweden

MSc., Electrical Engineering
Specialization: Digital Electronic Circuits
Amirkabir University of Technology
2015 - 2017 | Tehran, Iran

BSc., Electrical Engineering
Specialization: Electronics
Sharif University of Technology
2010 - 2015 | Tehran, Iran

Research Summary

During my doctoral studies at KTH NSLab, I have improved the performance of the Network Function Virtualization (NFV) service chains running at 100/200 Gbps by using **low-level optimization** techniques. My research has resulted in:

- Google PhD fellowship 2021 award in systems and networking.
- Top systems conference papers (EuroSys'19, ATC'20, ASPLOS'21, and NSDI'22).
- 15 patent applications filed by Ericsson (see the published applications).
- News articles at Ericsson Blog (about memory management, packet processing, and packet reordering), KTH news (about CPU cache and traffic order), Tech Xplore and Framtidens Forskning.
- Community award at NSDI'22 for "Packet Order Matters".
- Open-source contributions (CacheDirector, DDIO-Bench, PacketMill, DDC-RA, and IOMMU-Bench).

Watch this video and read my full CV for more information.

Experience

Jun 2017 - Present — **Doctoral Student/Researcher** — KTH NSlab
Stockholm, Sweden
Advisors: Professor Dejan Kostić & Professor Gerald Q. Maguire Jr.

- Proposed a slice-aware memory management technique to exploit the non-uniform cache architecture (NUCA) in Intel processors and implemented CacheDirector to send packets to the right slice of the Last-Level Cache (LLC).
- Implemented a set of benchmarks (DDIO-Bench) to study the effectiveness of Data Direct I/O Technology (DDIO) at 100 Gbps.
- Implemented PacketMill to grind the whole packet processing stack and produce a customized binary for a given network function.
- Analyzed a KTH campus trace to extract different flow-related characteristics to reorder packets using Reframer.
- Implemented a set of benchmarks (IOMMU-Bench) to study the impact of IOLTB misses on throughput and extended Page Pool API & mlx5 Linux driver to use 2-MiB hugepages for packet buffers to mitigate the IOLTB wall.

Tools: Linux kernel, DPDK, FastClick, iPerf, Perf, LLVM, Intel PCM, Intel PMU Profiling Tools, Cache Allocation Technology (CAT), Spark, Pandas.
Hardware: Intel Xeon & AMD EPYC processors, NVIDIA/Mellanox & Intel NICs.

Dec 2015 - Jun 2016 — **Portal Specialist** — Mobile Telecommunication Company of Iran (MCCI)
Tehran, Iran
Managed vendors and supervised the development of:

- eCare Application: MyMCI application for iOS and Android
- eSales Website eVoucher

Fall 2013 — **Co-founder and CEO** — CafeYab
Tehran, Iran
Designed & implemented an application for iOS and Android for finding nearby coffee shops.

Jun 2013 - Sep 2013 — **Summer Intern** — Informatics Services Corporation (ISC)
Tehran, Iran

- Ported an RF unit controller from PIC-16F877A to AtMega64A and tested the new module.
- Designed a remote-control system with HM-T and HM-R FSK modules.