

Alireza Farshin | Curriculum Vitae

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I am a researcher in the Network Systems Laboratory ([NSLab](#)) at KTH Royal Institute of Technology. I completed my doctoral studies in the same group under the supervision of Professor [Dejan Kostić](#) and Professor [Gerald Q. Maguire Jr.](#) My research interests include computer networks and networked systems. During my doctoral studies, I improved the performance of Network Functions Virtualization (NFV) service chains by using **low-level optimization** techniques. [Watch](#)

Education

- KTH Royal Institute of Technology** **Stockholm, Sweden**
 ○ *Ph.D. in Information and Communication Technology, School of EECS* *August 2017–March 2023*
 Advisors: Prof. [Dejan Kostić](#) and Prof. [Gerald Q. Maguire Jr.](#)
 Dissertation Title: Realizing Low-Latency Packet Processing on Multi-Hundred-Gigabit-Per-Second Commodity Hardware (see my [Dissertation](#))
 I have also received my [licentiate](#) degree (Halfway to Ph.D.) in June 2019, see my [Thesis](#).
- Amirkabir University of Technology** **Tehran, Iran**
 ○ *M.Sc. Electrical Engineering - Digital Electronic Circuits, Department of EE* *September 2015–July 2017*
 Advisor: Associate Prof. [Saeed Sharifian](#)
 Thesis: Resource Allocation in Software-Defined Networks for 5G Applications
 I used bio-inspired metaheuristic algorithms to perform resource allocation.
- Sharif University of Technology** **Tehran, Iran**
 ○ *B.Sc. Electrical Engineering - Electronics, EE Department* *September 2010–July 2015*
 Advisor: Associate Prof. [Mehran Jahed](#)
 Thesis: Design of Exoskeletal System for Wrist and Forearm

Publications

Conference Publications

Conference rankings based on the CORE ranking available at: <http://portal.core.edu.au/conf-ranks/>

- [C1] Hamid Ghasemirahni, Tom Barbette, Georgios Katsikas, **Alireza Farshin**, Massimo Gironi, Amir Roozbeh, Marco Chiesa, Gerald Q. Maguire Jr., Dejan Kostić. Packet Order Matters! Improving Application Performance by Deliberately Delaying Packets In *19th USENIX Symposium on Networked Systems Design and Implementation (NSDI)*. 2022. Acceptance rate (Spring): 28/104 \approx 26.9%, (conference rank **A**). **[Community Award Winner!]** [Download](#)
- [C2] **Alireza Farshin**, Tom Barbette, Amir Roozbeh, Gerald Q. Maguire Jr., Dejan Kostić. [PacketMill](#): Toward per-core 100-Gbps Networking In *International Conference on Architectural Support for Programming Languages and Operating Systems (ASPLOS)*. 2021. Acceptance rate: 75/398 \approx 18.8%, (conference rank **A***). [Download](#)

- [C3] **Alireza Farshin**, Amir Roozbeh, Gerald Q. Maguire Jr., Dejan Kostić. Reexamining Direct Cache Access to Optimize I/O Intensive Applications for Multi-hundred-gigabit Networks In *USENIX Annual Technical Conference (ATC)*. 2020. Acceptance rate: $65/348 \approx 18.6\%$, (conference rank **A**). [Download](#)
- [C4] **Alireza Farshin**, Amir Roozbeh, Gerald Q. Maguire Jr., Dejan Kostić. Make the Most out of Last Level Cache in Intel Processors In *The European Conference on Computer Systems (EuroSys)*. 2019. Acceptance rate: $45/207 \approx 21.7\%$, (conference rank **A**). [Download](#)

Journal Publications.....

- [J5] **Alireza Farshin**, Luigi Rizzo, Khaled Elmeleegy, Dejan Kostić. Overcoming the IOTLB wall for multi-100-Gbps Linux-based networking In *PeerJ Computer Science (PeerJ CS)*. 2023. **Impact factor: 2.41**. [Download](#)
- [J6] **Alireza Farshin**, Saeed Sharifian. A modified knowledge-based ant colony algorithm for virtual machine placement and simultaneous routing of NFV in distributed cloud architecture In *The Journal of Supercomputing (SUPE)*. 2019. **Impact factor: 2.469**. [Download](#)
- [J7] **Alireza Farshin**, Saeed Sharifian. A chaotic grey wolf controller allocator for Software Defined Mobile Network (SDMN) for 5th generation of cloud-based cellular systems (5G) In *The Journal of Computer Communications (COMCOM)*. 2017. **Impact factor: 2.816**. [Download](#)
- [J8] **Alireza Farshin**, Saeed Sharifian. MAP-SDN: a metaheuristic assignment and provisioning SDN framework for cloud datacenters In *The Journal of Supercomputing (SUPE)*. 2017. **Impact factor: 2.469**. [Download](#)

Patent Applications.....







- [P9] Amir Roozbeh, **Alireza Farshin**, Marco Chiesa. System and Method Performed Therein for Handling one or more Packets in a Computer Environment. PCT Application PCT/SE2023/050538. Filed in May 2023.
- [P10] Amir Roozbeh, **Alireza Farshin**, Marco Chiesa. Entity and Method Performed Therein for Handling Packets in a Computer Environment. US Provisional Application. Filed in November 2022.
- [P11] Amir Roozbeh, **Alireza Farshin**, Marco Chiesa, Dejan Kostić, Hamid Ghasemirahni. Hint Entity, Receiver Node, System and Methods Performed Therein for Handling Data in a Computer Environment. PCT Application PCT/SE2022/051036. Filed in November 2022.
- [P12] Amir Roozbeh, Chakri Padala, **Alireza Farshin**, Dejan Kostić, Gerald Q. Maguire Jr. Processing Unit, Packet Handling Unit, Arrangement and Methods for Handling Packets. PCT Application PCT/SE2022/050710. Filed in July 2022.
- [P13] Amir Roozbeh, **Alireza Farshin**, Marco Chiesa, Tom Barbette, Dejan Kostić. Packet Processing Including an Ingress Packet Part Distributor. PCT Application PCT/EP2023/063619. Filed in May 2022.
- [P14] Amir Roozbeh, **Alireza Farshin**, Dejan Kostić. System and Method for Organizing Physical Queues into Virtual Queues. PCT Application PCT/EP2022/051103. Filed in January 2022.
- [P15] Amir Roozbeh, **Alireza Farshin**, Marco Chiesa, Fabio Luciano Verdi. System and Method for Accurate Traffic Monitoring on Multi-Pipeline Switches. PCT Application PCT/EP2021/084572. [Download](#)
- [P16] Amir Roozbeh, Chakri Padala, **Alireza Farshin**. System and Method for Cache pooling and Efficient Usage and I/O Transfer in disaggregated and Multi-Processor Architectures via Processor Interconnect. PCT Application PCT/SE2021/051016. [Download](#)
- [P17] Amir Roozbeh, **Alireza Farshin**, Chakri Padala, Dejan Kostić, Gerald Q. Maguire Jr. System, Method, and Apparatus for Fine-grained Control of I/O Data Placement in Memory Subsystem. PCT Application PCT/SE2021/050803. [Download](#)

- [P18] Amir Roozbeh, **Alireza Farshin**, Tom Barbette, Dejan Kostić, Gerald Q. Maguire Jr. Methods and Systems for Efficient Metadata and Data Delivery between a Network Interface and Applications. PCT Application PCT/IB2021/052976. [Download](#)
- [P19] Amir Roozbeh, **Alireza Farshin**, Dejan Kostić, Gerald Q. Maguire Jr. Method and System for Efficient Input/Output Transfer in Network Devices. PCT Application PCT/SE2020/051107 ([Download](#)) & PCT/SE2020/051108 ([Download](#)).
- [P20] Amir Roozbeh, **Alireza Farshin**, Dejan Kostić, Gerald Q. Maguire Jr, Hamid Ghasemirahni, Tom Barbette. Reordering and Reframing Packets. PCT Application PCT/IB2020/054991. [Download](#)
- [P21] Chakri Padala, Amir Roozbeh, **Alireza Farshin**, Dejan Kostić, Gerald Q. Maguire Jr. Efficient Loading of Code Portions to a Cache. PCT Application PCT/SE2020/050527. [Download](#)
- [P22] Amir Roozbeh, **Alireza Farshin**, Dejan Kostić, Gerald Q. Maguire Jr. Entities, System and Methods Performed Therein for Handling Memory Operations of an Application in a Computer Environment. PCT Application PCT/SE2019/050948. [Download](#)
- [P23] Amir Roozbeh, **Alireza Farshin**, Dejan Kostić, Gerald Q. Maguire Jr. Methods and Devices for Controlling Memory Handling. PCT Application PCT/SE2020/050161. [Download](#)
- [P24] Amir Roozbeh, Dejan Kostić, Gerald Q. Maguire Jr., **Alireza Farshin**. Memory Allocation in a Hierarchical Memory System. PCT Application PCT/SE2019/050596. [Download](#)
- [P25] Amir Roozbeh, **Alireza Farshin**, Dejan Kostić, Gerald Q. Maguire Jr. Methods and Nodes for Handling Memory. PCT Application PCT/SE2018/051311. [Download](#)

Workshop Papers, Extended Abstracts, Technical Reports, Demo, and Posters.....

- [W26] **Alireza Farshin**, Amir Roozbeh, Christian Schulte, Gerald Q. Maguire Jr., Dejan Kostić. Scheduling - A Secret Sauce For Resource Disaggregation, *Technical Report*. 2021. [Download](#)
- [W27] **Alireza Farshin**, Tom Barbette, Amir Roozbeh, Gerald Q. Maguire Jr., Dejan Kostić. **PacketMill**: Toward per-core 100-Gbps Networking In *International Conference on Architectural Support for Programming Languages and Operating Systems (ASPLOS)*. 2021. [Download](#)
- [W28] **Alireza Farshin**, Amir Roozbeh, Gerald Q. Maguire Jr., Dejan Kostić. Optimizing Intel Data Direct I/O Technology for Multi-hundred-gigabit Networks In *The European Conference on Computer Systems (EuroSys)*. 2020. [Download](#)
- [W29] **Alireza Farshin**, Amir Roozbeh, Gerald Q. Maguire Jr., Dejan Kostić. Make the Most out of Last Level Cache in Intel Processors In *The European Conference on Computer Systems (EuroSys)*. 2019. [Download](#)

Open-Source Contributions

-  **iommu-bench**: Understanding the IOTLB Wall for Multi-100-Gbps Linux-based Networking [[Link](#)]
-  **DDC-RA**: A Constrained-based Scheduler for Disaggregated Data Centers (DDC) [[Link](#)]
-  **PacketMill**: Toward per-core 100-Gbps Networking [[Link](#)]
-  **ddio-bench**: Understanding Intel Data Direct I/O Technology [[Link](#)]
-  **Slice-aware Memory Management**: Exploiting NUCA Characteristic of LLC in Intel Processors [[Link](#)]
-  **CacheDirector**: Sending Packets to the Right Slice by Exploiting Intel Last-Level Cache Addressing [[Link](#)]

Work Experience

- **Network Systems Laboratory (NSLab) at KTH**
 Doctoral Student/Researcher

Stockholm, Sweden
 August 2017–now

- ICT Doctoral Programme Council at KTH**
Student Representative of the Division of Communication Systems (CoS)

Stockholm, Sweden
May 2018–December 2020
- Mobile Telecommunication Company of Iran (MCCI)**
Portal Specialist
 Vendor Manager & Portal/Application Supervisor:

 - eCare Application: My MCI Application for iOS and Android
 - eSales Website: eVoucher

Tehran, Iran
December 2015–June 2016
- CafeYab**
Co-founder and CEO
 An application for iOS and Android for finding nearby Coffee Shops

Tehran, Iran
Fall-2013
- Informatics Services Corporation (ISC)**
Internship

Tehran, Iran
June 2013–September 2013

 - 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.

Honors, Awards, and Professional Services

2023: Reviewer for IEEE Computer Architecture Letters.
2022: Packet Order Matters! [C1] was featured in the Ericsson Blog and KTH.
2022: "Framtidens Forskning" has published a Swedish article on my research.
2022: PC Member for SIGCOMM'22 posters and demos program.
2022: Packet Order Matters! [C1] received the "Community Award" at NSDI'22.
2022: Giving a talk, Optimization Techniques for NFV, at Cisco Engineering Switzerland.
2021: Awarded Google PhD Fellowship 2021 in Systems and Networking. [Interview with KTH EECS]
2021: PacketMill [C2] was featured in the Ericsson Blog.
2021: Giving a talk with Tom Barbette at FOSDEM'21. [Watch]
2020: EuroSys'20 Shadow Program Committee.
2019: CacheDirector [C4] was featured in the Ericsson Blog, Tech Xplore, AlphaGalileo, and KTH.
2018: External Reviewer for NSDI'19.
2015: **Ranked 107th** among more than 20,000 participants in Iran's universities entrance exam for M.Sc.
2010: **Ranked 46th** among more than 460,000 participants in Iran's universities entrance exam for B.Sc.

Teaching Experience

Communication System Design (IK2200), KTH. Fall 2022,2021,2020,2019,2018,2017.
 SDN and NFV (IK2220), KTH. Spring 2022,2021,2020,2019.
 Bio-Inspired Artificial Intelligence, Amirkabir University of Technology. Fall 2016.

Skills

Languages: English (Fluent), Persian (Native), Swedish (Novice)
Programming Languages: C/C++, Python, MATLAB, Scala, R, Assembly-X86, bash.
Tools & Libraries: DPDK, FastClick, Perf, LLVM, TensorFlow, Pandas, Spark, Gecode, Git, gnuplot, \LaTeX .

Hobbies

Playing Piano and Bass Guitar, Jamming with Friends, Reading Books, Watching Movies and TV Series.