

# 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 did my doctoral studies 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 have 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**, 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](#)
- [J6] **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](#)
- [J7] **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.....







- [P8] 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.
- [P9] 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.
- [P10] 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.
- [P11] Amir Roozbeh, **Alireza Farshin**, Marco Chiesa, Tom Barbette, Dejan Kostić. Apparatus, System, and Methods for Sliced Accelerated Packet Processing at Terabit-per-second Networking. US Provisional Application. Filed in May 2022.
- [P12] 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.
- [P13] 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. Filed in December 2021.
- [P14] 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](#)
- [P15] 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](#)
- [P16] 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](#)

- [P17] 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](#)).
- [P18] Amir Roozbeh, **Alireza Farshin**, Dejan Kostić, Gerald Q. Maguire Jr, Hamid Ghasemirahni, Tom Barbette. Reordering and Reframing Packets. PCT Application PCT/IB2020/054991. [Download](#)
- [P19] 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](#)
- [P20] 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](#)
- [P21] Amir Roozbeh, **Alireza Farshin**, Dejan Kostić, Gerald Q. Maguire Jr. Methods and Devices for Controlling Memory Handling. PCT Application PCT/SE2020/050161. [Download](#)
- [P22] Amir Roozbeh, Dejan Kostić, Gerald Q. Maguire Jr., **Alireza Farshin**. Memory Allocation in a Hierarchical Memory System. PCT Application PCT/SE2019/050596. [Download](#)
- [P23] 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.....

- [W24] **Alireza Farshin**, Amir Roozbeh, Christian Schulte, Gerald Q. Maguire Jr., Dejan Kostić. Scheduling - A Secret Sauce For Resource Disaggregation, *Technical Report*. 2021. [Download](#)
- [W25] **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](#)
- [W26] **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](#)
- [W27] **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** **Stockholm, Sweden**  
*Doctoral Student, Research Assistant, and Teaching Assistant* *August 2017–now*
- **ICT Doctoral Programme Council at KTH** **Stockholm, Sweden**  
*Student Representative of the Division of Communication Systems (CoS)* *May 2018–December 2020*

- **Mobile Telecommunication Company of Iran (MCCI)** **Tehran, Iran**  
*Portal Specialist* *December 2015–June 2016*  
 Vendor Manager & Portal/Application Supervisor:
    - eCare Application: My MCI Application for [iOS](#) and [Android](#)
    - eSales Website: [eVoucher](#)
  - **CafeYab** **Tehran, Iran**  
*Co-founder and CEO* *Fall-2013*  
 An application for iOS and [Android](#) for finding nearby Coffee Shops
  - **Informatics Services Corporation (ISC)** **Tehran, Iran**  
*Internship* *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.
  - **Informatics Services Corporation (ISC)** **Tehran, Iran**  
*Summer Intern* *June 2012–September 2012*
    - Did a literature review on expansion buses and digital data transfer.

## Honors, Awards, and Professional Services

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- 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 107<sup>th</sup>** among more than 20,000 participants in Iran's universities entrance exam for M.Sc.
- 2010: **Ranked 46<sup>th</sup>** among more than 460,000 participants in Iran's universities entrance exam for B.Sc.

## Teaching Experience

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- 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

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- 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

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