

# Alireza Farshin | Curriculum Vitae

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I am a Senior Researcher in the Connected Intelligence unit at RISE. My research interests include computer networks, networked systems, and artificial intelligence. Before joining RISE, I was a postdoctoral 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. During my doctoral studies, I improved the performance of Network Functions Virtualization (NFV) service chains by using **low-level optimization** techniques. 📺 [Watch](#)

## Work Experience

- Connected Intelligence Unit at RISE** **Stockholm, Sweden**  
 ○ Senior Researcher in AI / Machine Learning and Networking August 2023–now
  - Improving packet processing at multi-100-Gbps rates.
  - Using large language models (LLMs) to build and configure networked systems (see [NetBuddy](#)).
  - Developing pruning techniques and improving inference of LLMs.
- Network Systems Laboratory (NSLab) at KTH** **Stockholm, Sweden**  
 ○ Postdoctoral Researcher March 2023–August 2023
- Network Systems Laboratory (NSLab) at KTH** **Stockholm, Sweden**  
 ○ Doctoral Researcher August 2017–March 2023
- 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.

## 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 Girondi, 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, Dejan Kostić. Network Entity and Method Performed Therein for Handling one or more Packets in a Computer Environment. PCT Application PCT/SE2023/050880. Filed in September 2023.
- [P10] Amir Roozbeh, **Alireza Farshin**, Marco Chiesa. Network Entity and Method Performed Therein for Handling one or more Packets in a Computer Environment. US Provisional Patent Application 63/511,198. Filed in June 2023.
- [P11] 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.
- [P12] 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.
- [P13] 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.
- [P14] 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.







- [P15] 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.
- [P16] Amir Roozbeh, **Alireza Farshin**, Dejan Kostić. System and Method for Organizing Physical Queues into Virtual Queues. PCT Application PCT/EP2022/051103. [Download](#)
- [P17] 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](#)
- [P18] 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](#)
- [P19] 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](#)
- [P20] 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](#)
- [P21] 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](#)).
- [P22] Amir Roozbeh, **Alireza Farshin**, Dejan Kostić, Gerald Q. Maguire Jr, Hamid Ghasemirahni, Tom Barbette. Reordering and Reframing Packets. PCT Application PCT/IB2020/054991. [Download](#)
- [P23] 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](#)
- [P24] 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](#)
- [P25] Amir Roozbeh, **Alireza Farshin**, Dejan Kostić, Gerald Q. Maguire Jr. Methods and Devices for Controlling Memory Handling. PCT Application PCT/SE2020/050161. [Download](#)
- [P26] Amir Roozbeh, Dejan Kostić, Gerald Q. Maguire Jr., **Alireza Farshin**. Memory Allocation in a Hierarchical Memory System. PCT Application PCT/SE2019/050596. [Download](#)
- [P27] 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, Preprints, Technical Reports, Demo, and Posters....

- [W28] Changjie Wang, Mariano Scazzariello, **Alireza Farshin**, Dejan Kostić, Marco Chiesa. Making Network Configuration Human Friendly, *ArXiv Preprint*. 2023. [Download](#)
- [W29] **Alireza Farshin**, Amir Roozbeh, Christian Schulte, Gerald Q. Maguire Jr., Dejan Kostić. Scheduling - A Secret Sauce For Resource Disaggregation, *Technical Report*. 2021. [Download](#)
- [W30] **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](#)
- [W31] **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](#)
- [W32] **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

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-  **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](#)]

## Education

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- KTH Royal Institute of Technology**

Ph.D. in Information and Communication Technology, School of EECS

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 also received my [licentiate](#) degree (Halfway to Ph.D.) in June 2019, see my [Thesis](#).

**Stockholm, Sweden**

August 2017–March 2023
- Amirkabir University of Technology**

M.Sc. Electrical Engineering - Digital Electronic Circuits, Department of EE

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.

**Tehran, Iran**

September 2015–July 2017
- Sharif University of Technology**

B.Sc. Electrical Engineering - Electronics, EE Department

Advisor: Associate Prof. [Mehran Jahed](#)

Thesis: Design of Exoskeletal System for Wrist and Forearm

**Tehran, Iran**

September 2010–July 2015

## Honors, Awards, and Professional Services

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- 2023: Faculty at [Digital Futures](#).
- 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 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, L<sup>A</sup>T<sub>E</sub>X.

## Hobbies

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