Masoud Hemmatpour

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Date of Birth: May 29, 1983

Gender: Male

Personal Page: https://mashemat.github.io

Nationality: Iranian (Permanent Residency Norway)

Residence:Tromso, Norway

Online links to resources are included for easy access.

Positions

- **Arctic University of Norway (UiT)** — Tromso, Norway
  Postdoctoral Fellow — *May. 2023 – Current*
  - **Project**
    * Energy-efficient in-network intelligent framework for edge

- **Simula Lab** — Oslo, Norway
  Adjunct Research Scientist — *May. 2023 – Dec. 2023*
  - **Project**
    * In-network computing in HPC systems

- **Simula Lab** — Oslo, Norway
  Postdoctoral Fellow — *Mar. 2021 – May. 2023*
  - **Project**
    * In-network computing in HPC systems

- **Cisco systems** — Paris, France
  Senior Software engineer — *Jan. 2019 – Jan. 2020*
  - **Project**
    * Control and management plane in cloud-native environment

Education

- **Politecnico di Torino** — Torino, Italy
  PhD in computer engineering — *Nov. 2015 – Sept. 2019*
  - **Thesis**
    * High Performance Computing using InfiniBand based clusters

- **Politecnico di Torino** — Torino, Italy
  MSc in communications and computer networks engineering — *Oct. 2012 – Oct. 2015*
  - **Thesis**
    * Read-copy update synchronization technique improvement by hardware message passing
      Research project at École Politechnique Fédérale de Lausanne (EPFL)

- **Azad university of najaf abad** — Najaf abad, Iran
  Bachelor of Science, Computer Software Engineering — *2005 – 2008*
  - **Thesis**
    * Implementing bulk SMS (Short Message Service) sender with AT commands in Delphi programming

- **Bu-Ali Sina University** — Hamedan, Iran
  Association Degree, Computer Software — *2002 – 2004*
  - **Thesis**
    * Implementing answering machine with TAPI , Delphi programming

Work experience

- Power-efficient intelligent in-network framework (European Union's Horizon MISO project - University of Tromso)

- The goal of MISO project is to develop and demonstrate an autonomous in-situ observation platform for use in hard-to-reach areas. I develop an intelligent framework to reduce the power consumption of end nodes. Moreover, I develop an in-network intelligent solution to detect anomalies of IoT nodes.

- In-network computing (Simula Research Laboratory)

  - Exploring in-network computing research directions.
  - working on several programmable network devices including FPGA and Soc based SmartNIC as well as programmable switch.

- Network management (Linux Foundation Collaborative Project in Cisco Systems)

  - Designing and implementing a Yet Another Next Generation (YANG) model to enable VPP to communicate with remote controllers such as OpenDaylight (ODL) and Network Services Orchestrator (NSO) in order to receive telemetry and push configuration.
  - Enabling VPP to communicate with a network routing software suite such as FRRouting (FRR).

- Remote Direct Memory Access (RDMA) (Research project Politecnico di Torino & T.J. Watson IBM research center)

  - Investigating performance challenges of RDMA operations in InfiniBand based clusters.
  - Designing and implementing an RDMA enabled in-memory key-value store.

- Health care system (OPportunities for active and healthy LONgevity (OPLON) project)

  - Designing and implementing a holistic approach to detect an abnormal gait in order to avoid an unintentional fall and in case of a fall detection reduces injuries and notifies care givers.

- Fault injection (Research Project Politecnico di Torino & University of Montpellier)

  - Designing and implementing a framework to automatically inject faults into a real-time operating system (i.e., FreeRTOS) for STM32 Discovery boards.

- Linux kernel scheduler optimization (Research Project at Politecnico di Torino)

  - Introducing new parameter (i.e., the number of data cache misses) at the given time slice to the Completely Fair Scheduler (CFS). In this way, the scheduler can penalizes processes which waste CPU cycles to handle cache miss instead of the main task.

- Synchronization algorithm on multi core architecture (Research Project at Politecnico di Torino)

  - Implementing a framework to evaluate different synchronization methods including non-blocking algorithms.

- Urban air quality (Cyclair project Torino Living Lab)

  - Investigating the relevance of height in dust monitoring systems based on Libelium Waspmote connected to a dust sensor OPC-N2.

- System-on-a-chip (Research project Politecnico di Torino & École polytechnique fédérale de Lausanne (EPFL))

  - Exploiting hardware message passing feature in system-on-a-chip CPU (i.e., TILE-Gx36) in order to enhance the performnce of the non-blocking synchronization algorithm.

- Co-founder Fanavaran Pasargad J, Linux Professional Institute (LPI) partner

  - Teaching LPI courses to universities and organizations

Submitted proposals

- NetCrush: Crushing Communication wall with In-Network Machine Learning, 2023, excellence: 6/7

- Smart RDMA: In-Network Accelerated Processing of Big Data, 2022, excellence: 5/7

Teaching experience

- Teaching assistant in System Programming course, Politecnico di Torino, 3 academic years
  This course describes the programming interfaces for system programming and resource management and concurrent programming. It introduces system programming techniques within Unix-based operating system. I was responsible for the labs and final exam. Here is the lab resources.

- Teaching assistant in Operating Systems course, Politecnico di Torino, 2 academic years
  The course provides an overview of operating system (OS) architecture and its associated development frameworks, focusing on Unix-based operating systems. This involves examining the internal structure of the OS concerning the underlying hardware. I was responsible for the labs and final exam. Here is the lab resources.

- Teaching Linux courses in several universities and companies, more than 1000 hours
  Linux Professional Institute (LPI) is the global certification standard organization for open source professionals. It is the world's first and largest vendor-neutral Linux and open source certification body. I taught LPIC-1 and LPIC-2 courses.

Master thesis and internship supervision

- Main advisor of <u>master thesis</u>: Energy Efficiency of TinyML inference on MCU, Arctic University of Norway, Jurian Onderwater, 2024, ongoing

- Main advisor of <u>master thesis</u>: Path Planning ML Models for Autonomous UAVs, Arctic University of Norway, Aleksander Furnes, 2024, ongoing

- Main advisor of <u>master thesis</u>: Path Planning ML Models for Autonomous UAVs to detect hot spot, Arctic University of Norway, Eirik Nonskar, 2024, ongoing

- Main advisor of <u>master thesis</u>: Experimenting PCIe Interconnect, University of Oslo, Kristian Tjelta Johansen, 2024, ongoing

- Main advisor of <u>master thesis</u>: In-network Machine Learning, University of Oslo, Amadu Swaray, 2023, ongoing

- Main advisor of <u>master thesis</u>: Architecting In-Network Memory Access with FPGA SmartNIC for Scalable Data Centers, University of Oslo, Zain Farooqi, 2023, graduated

- Main advisor of <u>internship</u>: Evaluating BlueField-2 SmartNIC, University of Oslo, Zain Farooqi, 2023, graduated

- Main advisor of <u>internship</u>: In-network monitoring of RDMA traffic, Norwegian Business School, Nikshubha Kumar, 2023, graduated

- Co-advisor of <u>master thesis</u>:Accelerating ResilientDB Fabric via RDMAs & SGX, Shubham Pandey, University of California Davis, 2020, graduated

- Main advisor of <u>research project</u>: Kernel scheduler, Benito Lorenzo Pugliese, Dario Felice, Sebastiano Strano, Politecnico di Torino, 2018, graduated

- Main advisor of <u>research project</u>: Change scheduling priority according to cache miss rate, Anelli Donato, Cattaneo Roberto, Marchisio Alberto, Politecnico di Torino, 2017, graduated

- Main advisor of <u>research project</u>: Microsoft Azure InfiniBand Configuration, Gabriel Maiolini Capez, Politecnico di Torino, 2018, graduated

- Main advisor of <u>internship</u>: Effect of CPU scheduling on power consumption, Liu Youcun, Politecnico di Torino, 2016, graduated

- Co-advisor of <u>research project</u>: Fault injection on scheduler using FreeRTOS, Dario Mamone, Politecnico di Torino, 2016, graduated

Visiting programs and talks

- Laboratory for Information, Networking and Communication Sciences (LINCS), 2023

- University of Oxford, 2023

- University of California Davis (UC DAVIS), 2018

- Purdue University, 2017

- École Polytechnique Fédérale de Lausanne (EPFL), 2015

Scientific Community Engagement

- Organizing committee in Computer Software and Applications Conference (COMPSAC), 2017

- Technical Program Committee (TPC) in 7th European P4 Workshop (EuroP4), 2024

- Session manager in SmartGridComm, 2024

- Reviewers in several conferences and journals such as TKDE, TPDS, Supercomputing, 2015-2024

Awards

- Åsgard Horizon, 2023

- Best Dissertation Award Politecnico di Torino, 2019

- Quality Award Politecnico di Torino, 2018

- Quality Award Politecnico di Torino, 2017

- Provincial math prize, math house Isfahan, 2000

References

Noa Zilberman
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Xing Cai
Professor at the department of computer science, University of Oslo, Head of HPC department, Simula Research Laboratory, Norway
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