AMIN FOSHATI

Amin Foshati (/ˈfɒsˈhati/)
Ph.D. from Sharif University of Technology (SUT)
Department of Computer Engineering
Embedded **S**ystems **R**esearch **L**aboratory (ESRLab)

PHONE: +98 917 716 0122
EMAIL: A.FOSHATI@{SHARIF.EDU, GMAIL.COM}
LINKEDIN: LINKEDIN.COM/IN/FOSHATI
GOOGLE SCHOLAR

SUMMARY

University Lecturer specializing in Embedded Systems, Cyber-Physical Systems (CPS), and dependable computing, with a proven track record of interdisciplinary research, teaching, and industry collaboration. Expertise in fault tolerance, safety-critical design, and digital twins, supported by strong technical skills in C/C++, Python, Verilog, CUDA, and Matlab/Simulink, and experience across FPGAs, GPUs, multicore CPUs, and ARM-based embedded processors. Published in leading IEEE journals and conferences, and experienced in mentoring and teaching at both undergraduate and graduate levels. Passionate about advancing reliability and performance in modern computing architectures while contributing to inclusive, research-led education and interdisciplinary collaboration in computer science.

SKILLS

Hardware & Software Design
- Verilog
- System Verilog
- C/C++
- Pthread
- CUDA
- Open MP
- MPI

Hardware Platforms
- FPGAs
- Microcontrollers
- Mobile Devices
- ARM Cortex-M and Cortex-A
- GPU Nvidia
- Raspberry PI
- Arduino

OS Tools
- Linux
- Android
- Android Studio
- RTOS
- U-boot
- BitBake
- Buildroot

AI Tools
- Python
- Numpy
- Scikit-learn
- PyTorch
- Matlab Time Series Analysis
- WEKA

Simulation Tools
- Qemu
- ModelSim
- Proteus
- HSPICE
- Simulink
- Gem5
- McPAT

EDUCATIONS

- Sharif University of Technology, **Ph.D.** in **Computer Engineering** — **2020-2025**
  - **Thesis**: System-Level Approaches to Manage Physical Overheads in Cyber-Physical Automotive Systems
  - **Supervisor**: Alireza Ejlali
- Shahid Beheshti University (SBU), **MSc** in **Computer Architecture** — **2018-2020**
  - **Thesis**: Improving the Correctness of Parameter Extraction of Deep Neural Networks using Side Channel Analysis
  - **Supervisor**: Ali Jahanian

- Shiraz University, Shiraz, Iran, **MSc** in **Software Engineering** **2009-2012**
  - **Thesis**: Mapping Parallel Implementations of Signal Processing Applications on Graphics Processing Unit
  - **Supervisor**: Farshad Khunjus, Reza Sameni (Consultant Professor)

EXPERIENCES

- **Visiting Lecturer** at Sharif University of Technology, **Interface Circuit Design Course**, First Semester of **2024-2025**.
- **Visiting Lecturer** at Sharif University of Technology, **Digital System Design Course**, Second Semester of **2021-2022**, **2022-2023, 2023-2024, and 2024-2025**.
- **Visiting Lecturer** at Kish International Campus of Sharif University of Technology, **Computer Architecture**, Second Semester of **2024-2025**.
- **Teacher Assistant** of **Low-Power Design Course** (Graduate-level Students), Sharif University of Technology, Second Semester of **2022-2023, 2023-2024, 2024-2025**.
- **Teacher Assistant** of **Fault-Tolerance Design Course** (Graduate-level students), Sharif University of Technology, First Semester of **2021-2022, and 2022-2023**.
- **Instructor of Digital System Design Lab**, Sharif University of Technology, Second Semester of **2020-2021**.
- **Instructor of Hardware Lab**, Sharif University of Technology, **2021-2023**.
- **Research Assistant**, Sharif University of Technology, Tehran, **Since 2020**.
- **Engineering consultant**, Industrial Companies, **2016-2021**.
- **Founder and CEO** of Pars Bina Tech Company, Shiraz, Iran, **2015-2020**.
- **Researcher & Senior Software Developer** at Shiraz University, Center of Computing & IT, **2013-2016**.
- **Researcher and Developer** in the Electronic Research Center of Sharif University, **2010-2013**.
- **Teacher Assistant** of Software Engineering Course, Shiraz University, **2010**.
- **Junior Researcher** in Bashgahe Pajooheshgran Javan (BPJ) of Shiraz Azad University, **2009**.
- **Junior Researcher and Developer** in Premier Ideas Support Center of Shiraz University, School of Engineering, Shiraz University, **2006 -2010**.

HONORS

- Participated in the international competition of merchant agents in 2007, 2008, and 2010 and won first place in 2008.
- The first rank of the MSc degree at Shiraz University
- The second rank of the MSc degree at Shahid Beheshti University
- Top grade of Ph.D. at Sharif University of Technology
- Fifth rank in the KDD CUP International Tournament 2010 (student ranking).

PAPARES

- A. Foshati and A. Ejlali, "Digital Twin-Based Cyber Redundancies to Achieve Cost-Effective Fault Tolerance**,"** **IEEE Internet of Things Journal**, Early Access, doi:10.1109/JIOT.2025.3574101.
- A. Foshati, M.A. Moloudi, and A. Ejlali, "Digital Twin-Based Fault Effect Analysis Leading to Sudden Unintended Acceleration in Vehicles," **IEEE Transactions on Intelligent Vehicles**, Under Review.
- A. Foshati and A. Ejlali, "Enhancing Sensor Fault Tolerance in Automotive Systems with Cost-Effective Cyber Redundancy**,"** **IEEE Transactions on Intelligent Vehicles**, vol. 9, no. 4, pp. 4794-4803, April 2024, doi: 10.1109/TIV.2024.3379928.
- M. A. Moloudi, A. Foshati, H. Kalantari, and A. Ejlali, "A Combination of FMEA and Digital Twinning for Rapid, Accurate, and Online Diagnosis in Vehicles Using COTS Embedded Computing Devices," 2022 **CPSSI 4th International Symposium on Real-Time and Embedded Systems and Technologies** (RTEST), 2022, pp. 1-8, doi: 10.1109/RTEST56034.2022.9849859.
- Amin Foshati, Farshad Khunjush, [2012], A Novel Implementation for Double Precision and Real-Valued ICA Algorithm on GPU**, Euro-Par 2012 Workshops**, LNCS 7640, pp. 285–294, 2013.
- Sina Honari, Mojtaba Ebadi, Amin Foshati, Maziar Gomrokchi, Jamal Benatahr, and Babak Khosravifar, Price Estimation of PersianCAT Market Equilibrium, **IJCAI-09 Workshop on Trading Agent Design and Analysis, Pasadena**, California, USA, Monday, July 13, 2009.

- Sina Honari, Amin Fos-hati, Maziar Gomrokchi, Mojtaba Ebadi, Jamal Bentahar, Simulating New Markets by Introducing New Accepting Policies for the Conventional Continuous Double Auction, **SpringSim 2008**, Ottawa, Canada, April 14-17, 2008. SCS/ACM 2008.
- Sina Honari, Amin Fos-hati, Mojtaba Ebadi, Maziar Gomrokchi, Evaluation of PersianCAT Agent's Accepting Policy in Continuous Double Auction, Participant in CAT 2007 Competition**, 13th International CSI Computer Conference**, CSICC 2008 Kish Island, Iran, March 9-11, 2008.

SOME PROJECTS

- **Devising a Digital Twin** for Electronic Throttle Control (**ETC**):
  - The research project improved the fault diagnosis ability by two times better than classical approaches.
- **Analyzing the Vulnerability** for Convolution Neural Networks (**CNNs**) on **Zynq FPGA**:
  - The research project demonstrated that CNN model architecture can steal with attackers on multi-tenant FPGAs.
- **Implementing** Signal Processing Applications on **Multicore Processors**:
  - This industrial project showed nearly fourfold acceleration compared to the execution on a single-core processor.
- **Mapping** Signal Processing Applications on **GPGPUs**:
  - The industrial project achieved more than two times faster than the multicore processor.
- **Accelerating** the **Jade Algorithm** for Independent Components Analysis (**ICA**) using **GPGPUs**:
  - In comparison to CPUs, the study project's ICA performance increased by almost eight times.
- **Developing** an SNMP Manager and Monitoring Software with C/C++, Qt, and SQLite Technologies.
- **Customizing** Linux-based Indicators for Automotive Industries with Exploited Commercial-Off-The-Shelf (COTS) **Cortex-A Series of ARM Processors**.
- **Redesigning** a Static vehicle simulator with Unity, C#, **C/C++, and Qt** technologies, and designing an I/O board containing **Cortex-M Series of ARM Processors**.
- **Supervising** an Intelligent Cyber-Physical Project aimed at energy-saving and reducing industrial air conditioners' costs:
  - The industrial project exploited C/C++ and Qt technologies and designed customized control unit boards, including **Cortex-A and Cortex-M series of ARM processors**.

RECOMMENDATIONS

- **Alireza Ejlali**
  - Associate Professor **at Sharif University of Technology**
  - **Email:** ejlali AT sharif.edu
- **Farshad Khunjush**
  - Professor **at Shiraz University and** Adjunct Professor **at the University of Victoria**
  - **Email:** khunjush AT shirazu.ac.ir
- **Ali Jahanian**
  - Associate Professor **at Shahid Beheshti University**
  - **Email:** jahanian AT sbu.ac.ir