Reza Adinepour

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Research Interests

- ◇ AI Hardware Accelerators
- ◇ Reconfigurable Computing
- ◇ High Level Synthesis
- ◇ Real-time and Embedded Systems
- ◇ Cyber-Physical Systems (CPS)
- ◇ Neural Networks and Deep Learning

Education

M.Sc. in Computer Engineering, Sep. 2023 - Present
Amirkabir University of Technology (Tehran Polytechnic), Tehran, Iran
- ○ Thesis: *"FPGA-Based Hardware Acceleration of Remaining Useful Life Prediction of Rotating Machinery Using Transformer Neural Network"*
- ○ Advisor: Prof. Morteza Saheb Zamani
- ○ GPA: 3.4/4

B.Sc. in Electrical Engineering, Sep. 2019 - Jun. 2023
Shahrood University of Technology, Shahrood, Iran
- ○ Thesis: *"Design Real Time Face Recognition Systems Based on LBP Features on ODROID-XU4 Embedded Computer Board"*
- ○ Advisor: Prof. Alireza Ahmadyfard
- ○ GPA: 3.4/4

Research Collaborations

◇ **FPGA-Based Hardware Acceleration of Transformer Neural Network** Aug. 2023 - Now
Research Assistant, Supervisor: Prof. Morteza Saheb Zamani, Department of Computer Engineering, Amirkabir University of Technology.
- · *Studies and research focused on* ***Transformer hardware acceleration***
  I am conducting research on the implementation and acceleration of Transformer neural networks on FPGA with the goal of time series forecasting.

◇ **Real Time Embedded Face Recognition System** Sep. 2022 - Jun. 2023
Research Assistant, Supervisor: Prof. Alireza Ahmadyfard, Department of Electrical Engineering, Shahrood University of Technology.
- · *Studies and research focused on* ***LBP Features***
  I design an embedded systems that can detect and recognition human face, based on LBP features. This algorithm implement on **Odroid** embedded computer.

Teaching Experience

Teaching Assistant-Amirkabir University of Technology
- ○ **Embedded Systems Modeling & Design** Spring 2025
- ○ **Digital Logic Design** Fall 2024

Invited Lecturer-Amirkabir University of Technology
- ○ **Operating System Lab** Fall 2026
- ○ **Computer Architecture Lab** Spring 2025
- ○ **Logic Circuits Lab** Spring 2024 and Fall 2023

Teaching Assistant-Shahrood University of Technology
- ○ **Digital Electronics** Spring 2023
- ○ **Signal and Systems** Spring 2023, Fall 2022, Spring 2022, Fall 2021
- ○ **Analog Electronic** Fall 2022
- ○ **Circuit Theory** Fall 2020, Spring 2020

Honors and Awards

- ◇ **Direct Admission** of Master's Degree at **Amirkabir University of Technology (Tehran Polytechnic)**
- ◇ **Ranked** 2nd (**top 1%**) in Department of Electrical Engineering, Shahrood University of Technology, **Among More Than 120 Students**. 2023

Notable Projects

- **High-Level to RTL Conversion Framework for CNN Acceleration** (In Progress)
- **Secure and High-Performance Firmware Architecture Customization** (In Progress)
- **FPGA Implementation of Logic Locking in Deep Neural Networks**
- **Research-Oriented SystemC Examples**
- **Algorithm Acceleration on HBM-PIM Architecture using PIMSimulator**
- **FPGA-Based Implementation of CNN Using High Level Synthesis (HLS)**
- **Edge Detector HW/SW Co-design on FPGA**
- **HLS-Based Implementation of Vision Transformer (ViT)**
- **FPGA-Based Implementation of Neural Network**

Work Experience

Member of Digital System Design Automation Laboratory Aug. 2023 - Present
Tehran, Iran
Job Description: Research Assistant

R&D department Member, at D3H-Group Jun. 2023 - Sep. 2023
Al Maryah Island, Abu Dhabi, UAE
Job Description: Biomedical Signal Processing Developer

R&D department Member, at Radan Electronic StartUp May. 2022 - Aug. 2022
Mashhad, Iran
Job Description: Embedded Software Developer

R&D department Member, at Integrated Circuit Laboratory Jun. 2021 - Sep. 2022
Shahrood, Iran
Job Description: Head of The Hard Ware department on OAE Project

Skills

- **Programming Languages:**
  - **Back-end:** C, C++, Rust, Java, Python, Matlab,
  - **HDLs:** VHDL, Verilog, HLS, SystemC, Nvidia CUDA, OpenMP
- **Machine Learning Tools:** PyTorch, TensorFlow, Keras, Scikit-learn, OpenCV, NumPy, Pandas
- **Applications and Scientific Tools:**
  - **FPGA/Embedded Systems Development:** Xilinx Vivado, Vitis HLS, Vitis AI, FINN, Xilinx ISE, ModelSim, IAR, Keil, CubeMX, Altium Designer, KiCad, Spice, Arduino IDE
  - **Cloud & DevOps Engineering:** Git, GitLab, Docker
  - **Scientific Computing & Research Tools:** MATLAB, Gem5
- **Operating Systems:** Linux, Microsoft Windows
- **Typesetting:** TEX, LATEX, VIM , Microsoft Word, Gnuplot

References

Prof. Morteza Saheb Zamani
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