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Amir Ashtari Gargari

Curriculum Vitae

About

Date of birth **19 September 1995**.

Place of birth **Tabriz, Iran**.

Country of citizenship **Iran**.

Education

2017–Present **University of Tehran, Tehran, Iran**, *M.Sc. in Digital Electronic System*, GPA:18.10/20(4/4).

2013–2017 **University of Tabriz, Tabriz, Iran**, *B.Sc. in electrical engineering*, GPA: 16.76/20 (3.37/4).

Thesis

2017–Present **IoT Security Enhancement Based on Machine Learning Algorithms and PUF(Physically Unclonable Function)**.

- Supervisor: Dr. Bizhan Alizadeh
- Description: This thesis explores techniques to enhance realtime security using machine learning (ML) algorithms and physically unclonable functions (PUF) concept for device authentication in IoT network. The communication network simulation studies are carried out in the MATLAB software environment, and machine learning algorithms such as SVM, Random forest, and Deep learning algorithms such as CNN implemented in python language using Tensorflow, Keras, Numpy, scikit learn Libs.

2016-2017 **Industrial Sound Equalizer Defeat Detector Implementation, using Sound Processing Algorithms in ARM cortex-m4 architecture** .

- Supervisor: Dr. Jafar Sobhi
- Description: This thesis addressed the Defect Detection Device, which is noiseless and suitable for industrial applications. In this thesis, in order to detect sound-based defeats using sound processing algorithms, an Embedded system designed and implemented. Additionally, we use Stm32F407 microprocessor that architecture is ARM Cortex-m4 which comprises cortex-m3 and a DSP processor.

Research Interests

Deep Learning and Machine Learning .

Internet of Things (IoT) .

Biomedical Eng.

Image & Video processing.

Network &Hardware Security.

Hardware acceleration .

Selected Courses

2017-2019 **University of Tehran**.

- Neural Network and Deep learning
- Custom Implementation of DSP
- High Performance Computing
- Adv. VLSI
- VHDL and SystemC
- Methodologies and Algorithms for ESL Design Automation
- Formal Verification and Debug of Digital Systems
- Test and Testability

2013-2017 **University of Tabriz**.

- Digital Systems I II, and Labs
- Interface Circuits
- Pulse and Digital Circuits and lab
- Microprocessor System Design
- Electronic Circuits Design
- Telecommunication Circuits and Lab
- Industrail control lab
- Electronics I II, III, and Labs

Honors & Awards

2019 **Ranked 2st in the class of 2017 (major of Digital Electronic Systems), in terms of cumulative GPA**, *University of Tehran* .

2017 **Ranked 89th in the nationwide university entrance exam for Masters in electronics engineering**.

2016 **KINECT Sensor Computer Vision Workshop Attendance Certificate**.

2016 **Mechatronics Olympiad Attendance Certificate**.

2015 **Tabriz KHANE-KARGAR Robotics Competition Attendance Certificate**.

2015 **Ranked 1st in the first National Robotics Tournament Hegmatan Cup (among about 40 teams), Hamedan, Iran**, *project: Line Follower Robot*.

2014 **Ranked 1st in the Tenth Robotics Tournament National Noushirvan University (among about 60 teams), Babol, Iran**, *project: Line Follower Robot*.

2014 **Iranian Wind Energy Association (IWEA) Festival Attendance**.

2013 **Ranked top 1% in the nationwide university entrance exam for bachelors degree in mathematics & physics**.

2012 **Awarded choice national diligent student, Iran**.

2011 **Ranked 2nd in National Physics Laboratory Competitions, province of East Azarbaijan, Iran**.

Teaching Assistant

2019 **Formal Verification and Debug of Digital Systems, (Grad.)**, *Dr. B. Alizadeh*.

2019 **Custom Implemetation of DSP Systems (Grad.)**, *Dr. H. Mahdiani*.

2018 **Methodologies and Algorithms for ESL Design Automation (Grad.)**, *Dr. B. Alizadeh*.

2018 **Adv. VLSI (Grad.)**, *Prof. N. Masoumi*.

Research Assistant

2017-Present **Full-time RA in Debug, Verification,and Design of Embedded Systems lab**, *Dr. B. Alizadeh*, University of Tehran.

Patent

2019 **Teymorzadeh, Hamid. Ashtari, Amir. Dr. Mohammadi, Behnam. Dr.Seyedi, Heyrous. 2019, "Fault detection device in partial coupled transmission lines by adaptive impedance method", PATENT-1902-1046, Jul,13,2019, Accepted and under issue**.

Publication

A. Ashtari, *B. Alizadeh,"Deep Learning based Anomaly Detection to Authenticate IoT Nodes",In prep*.

A. Ashtari, *B. Alizadeh,"RKG-PUF: A Portable mutual IOT Authentication Scheme Using Real-Time Key Generation",Submitted to IEEE Internet of Things Journal*.

A. Ashtari, *A. Shabani,B. Alizadeh,"A New RF-PUF Based Authentication of Internet of Things Using Random Forest Classification",in 16th International ISC Conference on Information Security and Cryptology (ISCISC19),Accepted AUG 2019*.

A. Ashtari, *Neginsadat Tabatabaei, Ghazal Mirzaei, "An Optimized Performance Amplifier", Electrical and Electronic Engineering, Vol. 7 No. 3, 2017, pp. 85-89. doi: 10.5923/j.eee.20170703.03.*.

Skills & Abilities

Engineering Softwares: Pycharm,Keil, vivado,Labview, MATLAB, Altium Designer, QUARTUS II, ISE Design, Modelsim, Cadence Allegro, Ansys Siwave, Advance Design System (ADS), Catapult Hls Tool, Proteus, Orcad, Pspice, Hspice, CodeVision AVR, MiKroC PRO, Soc Encounter, TIA Portal, Microsoft Office, VISIO.

Programming Languages: Python, C, C++, VHDL, Verilog, SystemC, C#,Assembly

Experience

2019 **Tehran Petroleum Refinery**.

- Design and Implement PH meter, Controller and Analyzer Device.
- Project based

2017 **Niknam Electronic Rayan (NAR) Co**.

- Human Detection and Counting based on Video Processing in Embedded Systems for Security Devices.
- Software Engineer

2017-2019 **Electrovolt.ir**.

- Educational Subjects writer
- Topics: IoT, Python, FPGA.

2015-2017 **University of Tabriz**.

- Robotics Teacher
- Line Follower and Soccer player Robots, 5 Consecutive Semesters

2016 **East-Azerbaijan province Robotics Committee Branch**, *Sports Federation*.

- Robotics Teacher
- Line Follower

Internship

2017 **Niknam Electronic Rayan (NAR) Co. Electronic Lab**, *Dr. Matloub*, University of Tabriz.

Top Projects

2017-Present **Intrusion Detection in IoT Network**.

- Using Machine Learning Algorithms Such As SVM, Random Forest And Deep Learning Algorithms Such as CNN to Detect Attack in IoT Mesh and Star Network written in Python with Numpy, Keras, scikit learn Libs.
- Generate Dataset based on Physically Unclonable Functions(PUF) under the IEEE 802.15.04 Standard in Matlab.

2015-Present **Multiple Hardware Implementations on FPGA**.

- Implement based on RTL written in HDL.
- Projects such as R4SDC (Pipelined FFT), Frequency Regulator, Approximate Exponential, Crossbar Network, Simple CPU.

2019 **Aerial Image Processing**.

- Object Detection with Deep Learning on Aerial Imagery, Written in Python with Numpy, Keras ,and OpenCV libs.
- Using Transfer Leraning on COWC Dataset based on RetinaNet to detect Cars.
- Using SRGAN to upscale images Resolution.

2018 **Generate digits and photo by training a GAN Network**.

- Using DCGAN and BEGAN based on MNIST Dataset to Generate digits, written in Python with Numpy, Keras, Libs.
- Using DCGAN based on Cifar-10 Dataset to Generate Photo, written in Python with Numpy, Keras Libs

2018 **In-application Programming (IAP) over Ethernet in Arm platform**.

- Implement on STM32F7 (Cortex-m7) Microcontroller.
- using Lwip Lib written in C.

2018 **Design and Verification of S-band HF Analog PCB**.

- PCB Design by Altium Designer and Cadence Allegro.
- Verification by Ansys Siwave and Advanced Design System (ADS).

2015 - 2017 **Simulate multiple projects based on Digital Signal processing Using Matlab.** .

- Analyzing Effects of Quantization on Speech Quality
- Effects of Signal Scaling in FFT Block and Determination of Appropriate Word-Length
- Filter Design and Effects of Data Bus and Coefficient Quantization in Digital Filters
- Bit True Modeling and Implementation of 16 point FFT Using MATLAB and VIVADO

2017 **High Performance Computing**.

- CUDA, OpenMP, SIMD.

2017 **Human Detection based on Video Processing in Embedded Systems for Security Devices**.

- Implement on Raspberry Pi Embedded System.
- Using Camera as input, written in Python with OpenCV, Numpy Libs in Linux OS. in Python with Numpy, Keras Libs.

2013 - 2017 **Design Professional Line Follower Robot**.

2016 **Implementation of a system for detection of surface (glass) vibrations using IR light deflection**.

2016 **Implementation of an amplitude modulated radio transmitter**.

2016 **Implementation of a heartbeat signal extraction system based on piezoelectric sensors**.

Memberships & Volunteer Activity

2018-2019 **Prim Electronic Advisor of East-Azerbaijan province Robotics Committee Branch**, *Sports Federation*.

Oct 2017 **Executive member in the 4th national Digital Design Competition**, *University of Tehran*.

Aug 2018 **Chairman of Judge Committee of 2th National Robotics Competitions Azerbaijan**.

2016-2017 **Administrator of East-Azerbaijan province Robotics Committee Branch**, *Sports Federation*.

2014-2016 **Member of Student Branch IEEE Tabriz Section** , *(volunteer work)*.

2015-2016 **Administrator of Robotics Community**, *University of Tabriz*.

2016 **Training manager of International Energy Agency (IEA)**, *East-Azerbaijan province Branch*.

2015-2016 **Member of Smart Grid Committee**, *University of Tabriz*.

Feb 2016 **Executive member of 4th International Congress of Electric Industry**, *(volunteer work)*.

Languages

Azerbaijani Mother Tongue

Persian Native

English Fluent