Elham Karimi Gharighi

Contact Information

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Research Interests

Knowledge and experience in **HW/SW** development in both Academia and Industry made me interested in :

- **Signal Processing**
- **Machine Learning**
- **Biomedical Circuits and Systems**
- **Embedded Systems**
- **Robotics**
- **Mechatronics**

Education

- **M.Sc. in Energy Engineering (2011-2015)**
  Sharif University of Technology (SUT), Tehran, Iran - GPA: 3.1/4.0 (15.62/20)
  Thesis: Design and Construction of a Pulse Height Analyzer with FPGA at 25 MHz
  Designing a pulse height measurement system to collect information from a detector and create a histogram based on the value of the pulses.

- **B.Sc. in Electrical Engineering (2004-2008)**
  Shahid Rajaee Teacher Training University (SRTTU), Tehran, Iran - GPA: 3.8/4.0 (17.67/20)
  GPA last two semesters: 3.9/4.0 (18.22/20)
  Thesis: Noise Cancellation from ECG Signal Using Adaptive Filters
  Designing various adaptive filters such as NLMS, RLS ,... to eliminate diffirent noises from ECG signal and comparing them and finally combining some of them to achieve the best performance.

Publication

- **E. Karimi Gharighi**, F. Shojaee, M. Shams Esfand Abadi, 2008, "*Removal of Ocular Artifacts from Electro-Encephalogram by Affine Projection Adaptive Algorithm* ", 11th Iranian Electrical Engineering Student Conference, Zanjan, Iran, https://civilica.com/doc/48895.

Honors and Awards

- Exempt from M.S University Entrance Exam as an Exceptional Talented Student, Sharif University of Technology, Tehran, Iran, 2015.
- Out-standing B.Sc. student Shahid Rajaee Teacher Training University, Tehran, Iran, 2008.
- Scholarship for beeing top 0.5%, Nationwide entrance exam of Iranian Universities, very competitive with nearly 370,000 participants, 2004.
- Accepted in the Entrance Exam of National Organization for Developing Exceptional Talents (NODET) High School, Tehran, Iran, 2000.

Teaching Experienc (8 years- 9 courses)

- ***Instructor:***

• Arduino Workshop	2018-2019 (2 years)
• Circuit Theory	2011-2016 (4 years)
• Digital Electronics	2012 (6 months)
• AVR Workshop	2012 (6 months)
• Electricity Workshop	2012 (1 year)
• Logic Circuits	2010-2014 (2 years)
• Electronics Theory I	2010-2015 (3 years)
• Electronics Theory II	2010-2015 (3 years)
• Electronics Theory III	2012 (1 year)

- ***Teacher Assistant:***
  - Circuit Theory — Pre M.Sc. Course — 2012- 2013 (2 years)
  - Electronics Theory — Pre M.Sc. Course — 2012- 2013 (2 years)
  - Nuclear Electronic Devices — M.Sc. Course — 2012- 2013 (2 years)
  - Circuit Theory — B.Sc. Course — 2006 (6 months)

Professional Experience/Workshops

- **CS50's Introduction to Computer Science/Harvard University,online course in www.edx.org/144 hours-2021**

- **FPGA Workshop / Sharif University of Technology /120 hours - 2012**

- **R&D Engineer for Embedded Systems and Product Designer/ Fanpaya / 2018 - present**
  Design and Implementation of Environmental Measuring Systems Using Electrochemical and NDIR gas sensors and STM32 for hardware developing (embedded system) with STM32CubeMX.
  - Hardware analysis of system, board design (ARM/PIC/AVR based)
  - Performing the required simulation in MATLAB
  - Design hardware architecture
  - Embedded systems programming Using STM32CubeMX/Keil/IAR/Codevision
    ARM based design:
    - C/C++ arm based code development
    - Implement code on ARM, testing and debugging using Keil/IAR
  - Setting up, initializing and driving different interfaces and USB, SDCARD, GLCD, Keypad, Motor Driving, Relays and etc.
    Some sample projects:
    - Design and implementation of a ARM-based Exhaust Emission Analyzer beside flash memories, USB and SDCARD Interface with a custom software to capture data via (USB/Keypad) and 5 Gas sensors (Electrochemical and NDIR type) and demonstrate data on a color GLCD and measuring gas data from exhaust based on pre-defined cycle for pumps and self-cleaning process.
    - Design and implementation of a ARM-based Stack Flow Gas Analyzer beside flash memories, USB and SDCARD Interface with a custom software to capture data via (USB/Keypad) and 7 Gas sensors (Electrochemical and NDIR type) and demonstrate data on a color GLCD and measuring gas data from stacks of the factories based on pre-defined cycle for pumps and self-cleaning process.

    AVR based design:
    - C based code development
    - Implement code on ARV, testing and debugging using Codevision

    Some sample projects:
    - Design and implementation of a AVR-based UV-meter and showing results on a LCD with self-calibration function.
    - Design and implementation of a AVR-based Light-meter and showing results on a LCD with self-calibration function.
    - Design and implementation of a AVR-based Electromagnetic-meter and showing results on a LCD.

- **Electrical Engineer and R&D Engineer for Lighting Products in Manufactor / Khazarsheed / 2015-2018**
  R&D the electrical and lighting properties of LED light bulbs and florescent light bulbs using professional measuring systems and providing information for other units.
  - **Goniophotometer** for measuring light property of bulb such as glare, light distribution diagram, DIALux plugin and etc.
  - **Integrating Sphere Photometer** for measuring wavelength distribution of light bulbs, light efficiency and etc.

- **LED Driver Analyzer** for testing LED driver to achieve its efficiency and matching parameter with its light pcb for diagnosing problems in various production processes from factory Production Line until Commodity Return Unit and preparing appropriate report for Foreign Trade Unit to supply with the best Raw Materials for maximum productivity.
- **Electronic Ballast Analyzer** for testing and evaluating ballast performance and its parameters for diagnosing problems in various production process from factory Production Line until Commodity Return Unit and preparing appropriate report for Foreign Trade Unit to supply with the best Raw Materials for maximum productivity.
- Designing supply chain in company in order to evaluate the quality of the supply sources and calculate the best contract parameters with supply sources with professional reports
- Design and implementing of the rack-pallet in warehouse with maximum performance for warehouse unit
- Design and implementing a barcode system for whole materials in factory for maximum tracking efficiency
- Design and upgrading the pcb board of applicants such as vacuum cleaner, air cooler and etc.
- Instructing process control staff and workers with appropriate user manuals
- Providing information for getting Standard Sign and CE for products

- **Associate Researcher Embedded Systems / Sharif University / 2012- 2015**
  Working on master thesis, making a broad research to evaluate the output of a detector with random pulse heights. Because pulse duration was more than 1 millisecond so we designed system to gather pulses in a 25MHz rate and ADS, MATLAB and MultiSim were used to simulate each step of procedure and Xilinix was used for programing FPGA. After calculating each pulse height, a histogram was created in 1024 bins to export other data from that histogram.

- **R&D Electronics Engineer / Ariana Modern Epoch Innovators Engineering Company / 2009- 2011**
  Designing various electronic, mechatronic, robotics and industrial projects for other companies.
  - Circuit design
  - PCB design with Altium designer
  - AVR programming and debugging in Codevision
  - MATLAB programming with image processing toolbox, control toolbox and etc.
  - MATLAB Simulink toolbox for designing control projects
  - MATLAB GUI design
  - C/C++ programming for AVR and MATLAB
  - LABVIEW for designing some control and industrial projects with hardware actuator
  - Elementary Java script
  - Elementary Android programming and app designing
  - Image Processing and Speech Processing using MATLAB toolbox and implementing in hardware configurations

- **Web developer / Ghasedak / 2008-2009**
  Designing Website for various companies such as production company, educational institutions, portfolio for actors and so forth using HTML, CSS, JavaScript, PHP, MySQL, Adobe Photoshop

Accomplished Projects

- **Design and Construction of a Combustion Exhaust Analyzer for Automobiles and Vehicles Using Electrochemical Sensors and NDIR Type Sensors**, Fanpaya Co, 2019
- **Design and Construction of a Beehive Data logger using AVR and Altium Designer**, Khuzestan Agricultural Sciences and Natural Resources University, Department of Agricultural Engineering and Technology, 2017
- **Design and Construction of a Fruit Sorting for using in Manufacting Purposes by MATLAB Toolbox, AVR and Altium Designer**, Khuzestan Agricultural Sciences and Natural Resources University, Department of Agricultural Engineering and Technology, 2017
- **Design and Construction of a Cup Cake Baker System via Image Processing System using AVR, Altium Designer and MATLAB image processing toolbox**, Khuzestan Agricultural Sciences and Natural Resources University, Department of Agricultural Engineering and Technology, 2017

- **Design and Optimization of Calculation of a Particle Energy Deposition in Matter using MATLAB** , Sharif University of Technology, 2012
- **Design and Construction of a Cow Feeding System using various AVR, Altium Designer, RF and IR Modules and a lot of detailed hardware for user interface**, Private Engineering Company, 2010-2011
- **Design and Construction of a Weighting Data logger for Truck Terminal using AVR and Altium Designer** , Ariana Modern Epoch Innovators Engineering Company, 2009
- **Design and Construction of a Speech Recognition System for Authorizing Enterance using MATLAB Toolbox, AVR and Altium Designer**, Ariana Modern Epoch Innovators Engineering Company, 2009

Technical Skills

- **Programming:** C/C++, C#, JavaScript, Python, LABVIEW, MATLAB, MCNP
- **HDL:** Verilog, VHDL
- **Mathematical Tools:** MATLAB (M-File, GUI, Simulink), Maple, Mathcad, LABVIEW, Excel
- **Embedded/ Electrical Engineering CAD Tools:**
  - *FPGA:* Xilinx ISE, ModelSim
  - *Microcontroller (AVR, ARM):* AVR Studio, CodeVision AVR, Keil (ARM), IAR ARM, STM32CubeMX, Arduino, mikroC Pro for PIC
  - *Schematic and Board Design:* Cadence, OrCad capture, Altium Designer, Proteus, ADS
- **Web Design:** HTML, JavaScript, CSS, PHP, MySQL
- **Other Professional Software:** DIALux, AutoCAD
- **General Software:** LATEX, Microsoft office (Word, PowerPoint, Excel, Visio), Adobe Photoshop
- **Operating System:** GNU/Linux (Centos,Ubuntu), Microsoft Windows (Desktop, Server)

Mentionable Courses

- Microprocessors 20/20
- Electronics III 18.8/20
- Nuclear Electronics 16.5/20
- Computer Programming 18.5/20
- Computer Architecture 19.5/20
- Telecommunication Circuits 18.75/20

Test Scores

- **TOEFL IBT:** 89 (R:24, L:25, S:19, W: 21) – December 2019
- **GRE:** 305 (V:139, Q:166, W: 3) – March 2021

Language

- Persian (Fluent, mother tongue)
- English (Advanced)
- Arabic (Elementary)
- Azerbaijani (Fluent, mother tongue)
- Turkish (Advanced)

References

- **Dr. Naser Vosoughi, Associate Prof** Email: nvosoughi@sharif.edu
  Faculty of Energy Engineering Dep. Sharif University of Technology
- **Dr. Mohammad Shams, Associate Prof** Email: mshams@sru.ac.ir
  Faculty of Electrical and Computer Engineering Dep. Shahid Rajaee Teacher Training University
- **Mr Abbas Pazhoohesh, Senior Electronic Engineer** Email: a.pazhoohesh@yahoo.com
  CEO Manager of Jahan Electronic Co (JEPCO) and Khazarsheed Lighting Co (KKIPCO)
- **Dr. Shahriyar Shirvani Moghaddam, Associate Prof** Email: sh_shirvani@sru.ac.ir
  Faculty of Electrical and Computer Engineering Dep. Shahid Rajaee Teacher Training University