# MohammadHasan Shammakhi

Software/Hardware Developer

Location: Vancouver, British Columbia, Canada
Phone Number:+1(604)3963537
Professional links: PersonalWebsite |LinkedIn | GitHub
Email: mh.shammakhi@gmail.com

## Summary of Qualifications

- MSc graduate of Electrical Engineering, specializing in Communication Systems
- +7 years of experience in Communication Systems, Software/Hardware Development, GPU and FPGA Programming, C/C++, and Low-Level Programming.
- Proficient in Digital Communication, Signal Processing, SW/HW Development, and DeepLearning.
- Strong skills in FPGA and GPU programming, C/C++(IKM score:83) and Qt, MATLAB, Python(IKM score:82),and Git.
- Strong experience in using Object Oriented Programming, Concurrency(and thread safety), Memory Management(Stack, Heap), and Hardware-Software Interfaces in C/C++.
- Experience working with I/Os (PCIe, Ethernet(UDP, TCP), SPI, I2C, UART, and etc.), Linux (Debian-based, Fedora).
- Effective in teamwork and skilled in project management.
- Dedicated professional, problem-solving mindset, and attentive to quality and detail.

## Experience

- **Project Manager and Applied Research and Development** Mar 2020 - Apr 2023
  *Sunyar Co*
  - **Satellite and Wireless Communication System Designing**: Developed real-time satellite and wireless communication systems for various projects, encompassing the design and implementation of systems such as the GMR satellite receiver, GPU-Based Software Defined Radio (SDR), DVBS, DVBS2, and DVBS2X receivers, IDIRECT satellite receiver, and a customized communication link for video transmission.The Design meets specific requirements and employed GPUs or FPGAs based on project demands.
  - **Software Developer**: Experienced in designing real-time software using Qt or C++, involving the implementation of various processes, system controls, and GUI management.
  - **Hardware Developer (GPU)**: Implemented the physical layer and data link layer of communication links, encompassing various types of channel coding, decoding, interleaving, scrambling, and source encoding/decoding, in both the transmitter and receiver sides.
  - **Hardware Developer (FPGA)**: Implemented SDRs and satellite receivers, Additionally, implemented combined GPU-FPGA-based systems.
  - **AI-Based System Developer**: Designed and implemented deep learning based automatic modulation recognition system
  - **Other Responsibilities**: Established this company and Managed more than ten projects in about three years.
- **Project Manager and Applied R&D** Sep 2018 - Mar 2020
  *Farateif Pouya Technology*
  - **System Designer**: Developed diverse communication systems tailored for implementation in FPGAs and GPUs, employing both fixed-point and floating-point architectures to meet specific requirements.
  - **Senior Software and Hardware Developer**: Implemented CPU and GPU-based projects utilizing Qt, C++, and CUDA for efficient real-time data processing. Additionally, designed GPU-FPGA based projects employing CUDA, system generator, and VHDL to leverage the power of parallel processing.
  - **Tutor**: Mentored and trained over ten individuals in the field of software and hardware engineering, in addition to fulfilling other responsibilities.
- **Software and Hardware Developer** Feb 2015 - Sep 2018
  *Farateif Pouya Technology*
  - **C++ and Qt Developer**: Developed projects using Qt, C++, and occasionally C# to handle real-time data processing, data visualization, and GUI management.

- **FPGA Developer**: Executed multiple projects utilizing Xilinx FPGAs with the System Generator tool and occasionally VHDL to construct advanced wideband communication systems.

- **Communication System Advisor** Aug 2018 - Nov 2018
  *Sepehran*
  - **FPGA-Based System Advisor**: Addressed longstanding challenges that persisted within the company for over a year by successfully implementing an enhanced anti-jamming algorithm as a subblock for their radar project.

## Education

- **M.Sc. in Electrical Engineering, Communication Systems** 2014–2016
  *Amirkabir University of Technology* *Tehran, Iran*
  Thesis: Sparse Modeling Methods based on Machine Learning (19.4/20),
  *Specialization: Signal Processing Based on Machine Learning*

- **B.Sc. in Electrical Engineering, Electronics** 2010 – 2014
  *Shahid Rajaee University* *Tehran, Iran*
  Thesis: Differential Research of SPECK Block Cipher (20/20),
  *Specialization: Cryptography*

## Skills

- **GPU Programming:** CUDA (Expert), cuFFT, cuBLAS, Multistream
- **Engineering Tools:** System Generator(SysGen), Xilinx Vivado & ISE, Proteus, CodeVision, MATLAB
- **AI and Signal Processing:** Machine Learning (scikit-learn), Neural Network and Deep Learning (Tensorflow, Pytorch), Signal Processing (Scipy), Image processing and Computer Vision(OpenCV, scikit-image, PIL), Video Streaming (FFMPEG, GStreamer), Parallel Processing(Cupy, Numba), and Numpy
- **Programming Languages and IDEs:** C(Advanced), C++(Expert - IKM score: 83), Qt(Expert), Assembly(Beginner), Python (Advanced - IKM score: 82), R(Intermediate), CUDA(Expert)
- **Operating Systems:** Windows, Linux
- **FPGA Programming:** System Generator (Expert), VHDL(Advanced), HLS(Beginner)
- **Typesetting:** LaTeX, Microsoft Office
- **Source Control:** Git(Intermediate)

  **Human Languages:** Persian(Native), English(Intermediate)

## Publications

- P. Haji Faraji, M.H. Shammakhi, H. Sheikhzadeh , **" Joint Feature-Sample Selection for Facial Expression Recognition",**, Computer Vision and Image Understanding, Elsevier . **2023** (Submitted)(It can be found in my Github page)
- M.H. Shammakhi, P. Haji Faraji , **"Gb/Sec Frame-Based Phase Locked Loop on Gpu ",** 2022.
- M.H. Shammakhi, P. Haji Faraji, M. Mohammadi, M. Hoseinzadeh ,**" GPU-Based Parallel Algorithm for Wide-band Signal Timing Recovery",** Turkish Journal of Computer and Mathematics, 2021.
- M. Soltani, M.H. Shammakhi, S. Khorram, H. Sheikhzadeh ,**" Combined mRMR Filter and Sparse Bayesian Classifier for Analysis of Gene Expression Data",**, 2016 2nd International Conference on Signal Processing and Intelligent Systems 13-15 Dec. 2016
- M.H. Shammakhi , V. Ghanbari, "In Persian Title,", 2016 1st International Conference New Perspective in Electrical and Computer Engineering, Sep. 2016
- M.H. Shammakhi , V. Pourahmadi ,P. Khavari , A. Mirzaei ,**"Combined mRMR-MLPSVM scheme for high accuracy and low cost handwritten digits recognition",** 2015 9th Iranian Conference on Machine Vision and Image Processing (MVIP). IEEE, 18-19 Nov. 2015

## References

The list of references will be provided to recruiters on demand.