Mehran Ahadi

Interested in RF Electronics, Antennas, Signal Processing, and Embedded Systems.

Contact Information

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Education

- **Université Laval**   QUÉBEC, QC, CANADA
  Ph.D. Candidate in Electrical Engineering   *2019 - 2024 Expected*
  - **Thesis Title:** Design and Development of a Novel Wearable Technology for Vital Signal Monitoring
  - **Supervisor:** Prof. Younès Messaddeq — Université Laval — Québec — QC — Canada
  - **Co-Supervisor:** Prof. Amine Miled — Université Laval — Québec — QC — Canada

- **Amirkabir University of Technology — Tehran Polytechnic**   TEHRAN, IRAN
  M.Sc. in Photonics Engineering   *2016 - 2019*
  - **Thesis Title:** Design & Simulation of a Metasurface using Graphene

- **Semnan University**   SEMNAN, IRAN
  B.Sc. in Electrical Engineering (Communications)   *2011 - 2016*
  - **Project Title:** Implementation of a Simple 2D Graphics Processor Using FPGA

Publications

- **Patents:**

  1. **M. Ahadi**, A. Miled, M.-A. Dugas, Y. Messaddeq, Upcoming US patent, To be filed in Dec 2023.

  2. A. Jafargholi, S. S. M. Khaleghi, K. Goudarzi, **M. Ahadi**, P Parvin, "Metamaterial Loaded Antennas," US Patent No. 17/478,963, Filed Sep. 20, 2021. US Publication US20220006199A1 on Jan. 6, 2022.

  3. **M. Ahadi**, A. Jafargholi, and P. Parvin, "EMNZ metamaterial switch configured for use in a phase array antenna and a leaky-wave antenna," US Patent No. 17/207,627, Filed Mar. 20, 2021, Granted Nov. 29, 2022. US Publication US11515641B2.

  4. **M. Ahadi**, A. Jafargholi, and P. Parvin, "EMNZ metamaterial switch configured for antenna modulation in a switched-beam array antenna," US Patent No. 17/180,839, Filed Feb. 21, 2021, Granted Nov. 29, 2022. US Publication US11515640B2, WIPO Publication WO2021165932A1 on Aug. 26, 2021 in English and French.

  5. **M. Ahadi**, A. Jafargholi, and P. Parvin, "EMNZ metamaterial configured to form a switch, a multiplexer, and a phase shifter," US Patent No. 17/166,037, Filed Feb. 3, 2021, Granted Nov. 8, 2022. US Publication US11495868B2, WIPO Publication WO2021156786A1 on Aug. 12, 2021 in English and French.

  6. **M. Ahadi**, A. Jafargholi, and P. Parvin, "EMNZ metamaterial configured into a waveguide having a length that is less than or equal to 0.1 of a wavelength," US Patent No. 17/096,482, Filed Nov. 12, 2020, Granted Nov. 15, 2022. US Publication US11502383B2, WIPO Publication WO2021094943A1 on May. 20, 2021 in English and French.

- **Scholary Works:**

  1. **M. Ahadi**, M. Roudjane, M.-A. Dugas, A. Miled, and Y. Messaddeq, "Wearable Sensor Based on Flexible Sinusoidal Antenna for Strain Sensing Applications," Sensors, vol. 22, no. 11, p. 4069, May 2022, doi: 10.3390/s22114069.

  2. H. Abed, S. Bellemare-Rousseau, B. Bélanger-Huot, **M. Ahadi**, É. Drouin, M. Roudjane, M. Dugas, A. Miled, Y. Messaddeq, "A Wire-free and Fiber-Based Smart T-Shirt for Real-Time Breathing Rate Monitoring," in IEEE Sensors Journal, 2021. doi: 10.1109/JSEN.2021.3139032.

Skills

- **Languages:**

  - Full Professional Proficiency in **English**
    TOEFL score: **101** (Reading: 28, Listening: 26, Speaking: 23, Writing: 24)   *2019*
  - Limited Working Proficiency in **French**
    CEFR Level: **Intermediate (B1)**
  - Native in **Persian**

- **RF & Microwave:**

  - **Experiences:** RF System Design, High-Frequency PCBs, Filter Design, Antenna Design, Metamaterials, Frequency Selective Surfaces (FSS), Transmission Lines
  - **Software:** CST Studio Suite, Ansys HFSS, COMSOL EM Simulations, Keysight ADS and RFPro
  - **Hardware:** Vector Network Analyzers, Spectrum Analyzers, RF Signal Generators, High-Frequency Oscilloscopes, Microwave Waveguides & Passive Components

- **System Design:**

  - **Technologies:**
    * **Signal Processing:** Real-time Digital Signal Processing, Digital & Analog Filter Design, Cryptography (RSA, AES, Hashing)
    * **Embedded:** Zephyr RTOS, FPGA, ARM Cortex-M, NRF5x MCU Family, Raspberry Pi
    * **Protocols:** Bluetooth LE (GATT Protocol), VoIP Protocol (Gateways, SIP, Clients), IP Network
    * **Neural Networks:** TensorFlow, PyTorch
    * **Computer Vision:** OpenCV
  - **Programming Languages:** C, C++, Python, Java, Kotlin, MATLAB, VHDL, Javascript, PHP
  - **Operating Systems:** GNU/Linux (*nix), Microsoft Windows
  - **Software & DKs:** MATLAB and Simulink, Altium Designer, Keysight ADS, Xilinx Vivado, Xilinx ISE & EDK, nRF Connect SDK, Android SDK, Solidworks

- **Others:**

  - **Software Dev:** Android SDK, Node.js, Apache Webserver, Relational DBs (MySQL and PostgreSQL), NoSQL DBs (Redis), RESTful and Websocket APIs
  - **Tools:** Bash, Git, Mercurial, Virtualization
  - **Type Setting:** LaTeX, Markdown (MD), Microsoft Office, HTML+CSS
  - **Graphics:** Adobe Photoshop, DaVinci Resolve

Work Experiences

- **Ph.D. Candidate: COPL / LABioTRON**
  Université Laval — Québec — QC — Canada   *2019 - 2024 Expected*
  - Focused on Novel Technologies of Human Vital Signal Monitoring and Processing, comprised of:
    (1) Antenna Design, **(2)** RF Circuits & Systems Design, **(3)** Real-time Signal Processing, and **(4)** Embedded Systems Design.

- **Research Assistant: Centre hospitalier de l'Université Laval (CHUL)**
  CHU de Québec — Université Laval — Québec — QC — Canada   *2022 - 2023*
  - Signal Processing and Analysis of Local Field Potential (LFP) brain signals recorded from rodents

- **Web Developer / Designer**
  Université Laval — Québec — QC — Canada   *2021 - 2022*
  - The official homepages of COPL department of Université Laval, and YMLab Research Group

- **Research Assistant: Electromagnetics and Antenna Lab**
  Amirkabir University of Technology — Tehran — Iran   *2016 - 2019*
  - Focused on Reflect Array Antennas, Metamaterials, Graphenes, and Terahertz Regime.

Teaching Experiences

- **Teacher Assistant: Advanced Electrodynamics (I)**
  Amirkabir University of Technology — Tehran — Iran   *Fall 2018*
- **Teacher: Robotics and Digital Electronics**
  Salam Iran Zamin High School — Tehran — Iran   *Fall 2017 - Spring 2018*
- **Teacher: Fundamentals of IT & Microprocessors**
  Mandegar Alborz High School — Tehran — Iran   *Fall 2016 - Spring 2017*
- **Workshop Instructor: Meteor Radiotelescope Design Workshop**
  Rey Astronomy Center — Tehran — Iran   *Nov 2015*
- **Teacher Assistant: C++ Programming**
  Semnan University — Semnan — Iran   *Fall 2011*

Certifications

- **Keysight Pathwave ADS EM Advanced**   *2021*
  Keysight & CMC Microsystems
- **COMSOL Low- and High-frequency Electromagnetics Modeling**   *2020*
  COMSOL & CMC Microsystems — Workshop held at University of Waterloo
- **CompTIA Network+**   *2013*
  Rahin Network Training Center
- **AVR Family Microcontrollers**   *2013*
  Students' Scientific Association of Electrical Engineering — Semnan University
- **Advanced C++ Programming**   *2012*
  Academic Center for Education, Culture and Research (ACECR)

Volunteer Works

- **Students' Scientific Association of Electrical Engineering**
  Semnan University — Semnan — Iran   *2014*
  - Contributed with Magazine Editorial board; Organized student events; Published technical articles.

- **Open-Source Community Contributions**

  - Contributions released on **GitHub** at github.com/zxcmehran, notably the **B.Sc Project** as an Open Source Xilinx IP Core under MIT License

- **Community Contributions**

  - Minor contributions on English and Persian Wikipedia; Local Google Maps Contributor; Contributor in Stack Overflow and other Stack Exchange websites

Other Interests

DIYs, Hiking, Swimming, Skiing, Online Gaming

Last Updated: November 2023