

# Mehran Ahadi

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## Contact Information

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## Education

- **Amirkabir University of Technology — Tehran Polytechnic** TEHRAN, IRAN  
*M.Sc. in Photonics Engineering* 2016 - 2019
    - **GPA: 17.45/20 or 3.62/4**
    - **Thesis Title:** Design & Simulation of a Metasurface using Graphene
    - **Supervisors:**
      - \* **Prof. Parviz Parvin** — Amirkabir University of Technology — Tehran — Iran
      - \* **Dr. Amir Jafargholi** — Amirkabir University of Technology — Tehran — Iran
  - **Semnan University** SEM NAN, IRAN  
*B.Sc. in Electrical Engineering (Communications)* 2011 - 2016
    - **Project Title:** Implementation of a Simple 2D Graphics Processor Using FPGA
    - **Supervisor:** **Dr. Hamid Meghdadi Neyshabouri** — Semnan University — Semnan — Iran
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## Related Courses

Photonics (I), Photonics Laboratory, Photonic Crystals, Laser (I), Laser Spectroscopy, Special Topics in Photonics Engineering (Metamaterials), Applied Quantum Mechanics, Numerical Techniques in Electromagnetics, Microwave (I), Electromagnetic Fields and Waves, Antenna

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## Research Interests

Graphenes, Metamaterials, Terahertz, Integrated optical devices, Photonic crystals, Plasmonics, Laser & Spectroscopy, Antennas, RF & Microwave, Numerical Techniques, FPGAs.

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## Publications

### • Journal Papers:

1. **M. Ahadi**, P. Parvin, and A. Jafargholi, “Designing a Terahertz Reflect Array Antenna Using Graphene and ENZ Metamaterials,” *IEEE Transactions on Antennas and Propagation* (to be submitted)
2. A. Bagheri, **M. Ahadi**, and A. Jafargholi, “Reflectarray Antenna at Terahertz Using Graphene,” *Optics Letters* (to be submitted)
3. **M. Ahadi**, P. Parvin, and A. Jafargholi, “An Ultra Wide-band Tunable Terahertz Reflect Array Using Graphene and ENZ Metamaterials” *Optics Letters* (in preparation)
4. A. Bagheri, **M. Ahadi**, and A. Jafargholi, “Tunable graphene reflective cells for THz reflectarrays,” *IEEE Transactions on Antennas and Propagation* (in preparation)
5. A. Geravand, **M. Ahadi**, and M. Danaie, “Plasmonic high performance demultiplexer using side coupled triangular and disk resonators” (in progress)

### • Books:

1. Arnold, S., “Getting Started in Radio Astronomy: Beginner Projects for the Amateur,” Springer New York, (2013), Translated by P. Howaida, S. Aghelpasand, and **M. Ahadi** (in progress)
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## Notable Academic Projects

- **M.Sc Thesis: Designing a Metasurface Structure**  
*Supervisors: Prof. Parviz Parvin, Dr. Amir Jafarholi* 2016 - 2019
    - Designing high-performance reflectarrays using graphenes and ENZ metamaterials
    - Designs are simulated and validated using CST Microwave Studio proprietary software & MATLAB.
  - **ADS Component of Cross Graphene patch for FSS TLine models**  
*Supervisor: Dr. Amir Jafarholi* Spring 2018
    - Developed a component in Keysight Advanced Design System (ADS) environment for simulating Cross Graphene patches / apertures in FSS transmission line models.
  - **Simulating FDTD, FEM, and MoM algorithms in various settings and conditions**  
*Supervisor: Dr. AmirNader Askarpour* Fall 2017
    - Algorithms implemented in MATLAB in various settings and boundary conditions like PML and Higdon boundary conditions.
  - **B.Sc Project: Implementation of a Simple 2D Graphics Processor Using FPGA**  
*Supervisor: Dr. Hamid Meghdadi Neyshabouri* 2015 - 2016
    - Implemented using a VGA DAC and a VirtexII-Pro FPGA chip containing a PowerPC Microprocessor
    - A 2D GPU that drives the monitor, plots basic **geometric shapes**, prints standard **ASCII** characters and strings, and offers a **terminal-like console** output reflowing the text.
    - This project is released as an **open source** Xilinx IP Core on GitHub. [Read More at my Homepage.](#)
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## Teaching Experiences

- **Teacher Assistant: Advanced Electrodynamics (I)** *Dr. Amir Jafarholi*  
*Amirkabir University of Technology — Tehran — Iran* Fall 2018
  - **Teacher: Robotics and Digital Electronics**  
*Salam Iran Zamin High School — Tehran — Iran* Fall 2017 - Spring 2018
    - A short course for enthusiast students at one of the most reputable local high schools.
    - Digital Electronics basics, PC organization, Operating Systems and hardware, Microcontrollers and Single-board PCs, Implementing Algorithms and C Programming language at elementary level.
  - **Teacher: IT & Microprocessors**  
*Mandegar Alborz High School — Tehran — Iran* Fall 2016 - Spring 2017
    - Short extra-curricular course at Mandegar Alborz, which is a well-known High School founded in 1873 with numerous notable alumni.
    - PC organization, Data storing and transferring concepts, 3D and Game Design basics, Internet and Networking basics, Operating Systems, and ultimately Python programming at elementary level.
  - **Workshop: Meteor Signal Detection Workshop**  
*Rey Astronomy Center — Tehran — Iran* Nov 2015
    - A single-day workshop of radioastronomy. Introduced a suitable Antenna and Receiver Circuit design letting individuals make a Radio Telescope capable of receiving ELF to VLF frequency ranges radiated from Meteors hitting Earth atmosphere. More details and materials are available on my [Homepage](#).
  - **Teacher Assistant: C++ Programming** *Eng. Morteza Zangian*  
*Semnan University — Semnan — Iran* Fall 2011
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## Work Experiences

- **Research Assistant: Electromagnetics and Antenna Lab**  
*Amirkabir University of Technology — Tehran — Iran* 2016 - 2019
  - **Supervisor:** Dr. Amir Jafarholi
  - Focused on Reflect array antennas, Metamaterials, Graphenes, and Terahertz Regime
  - More info on research at [ema-lab.aut.ac.ir](http://ema-lab.aut.ac.ir).
- **Startup: A Centralized Learning Companion**  
*(Naming pending)* 2016 - 2017
  - Founded by a team of two, including me as Chief Technologist. A mobile-first solution to help students manage their courses, materials, and homeworks, and get the latest updates about their courses and events around the campus. Written using PHP, JS, and Java on Android.
  - Left before initial release (during development phase) in favor of focusing on **academic work**.

- **Network-based Applications Developer**  
*Ramznegar Group — Tehran — Iran* 2013 - 2016
    - Small local company focused on IT and Software. Cooperated as freelancer part-time remote colleague
    - Several small projects accomplished; including:
      - \* Configuring a large-scale VoIP network of several Gateways, Modems, IP Phones, and SIP Servers
      - \* Web-based Modular Enterprise Resource Planning (ERP) system
      - \* Online Certificate Issuance System
      - \* Online Persian Yearbook/Calendar
      - \* Online Reservation and Management system for Clinics
  - **Startup: Arta Content Management Framework**  
*ArtaProject.com* 2009 - 2014
    - A non-profit project founded by myself. Discontinued as of 2014.
    - An **Open Source** Content Management Framework based on PHP, JS and HTML5. An extensible solution built on MVC pattern. Discontinued in favor of newer experiences.
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## Notable Presentations

- **Coherent anti-Stokes Raman spectroscopy (CARS) specifications, setup, and applications**  
*Laser Spectroscopy, Spring 2017*
    - **Supervisor:** Prof. Parviz Parvin
  - **Plasmonics: Theory, waveguides, and SPR applications in imaging and monitoring**  
*Special Topics (Metamaterials), Spring 2017*
    - **Supervisor:** Dr. Amir Jafargholi
  - **A closer look to the techniques used in fabricating 1D, 2D, and 3D Photonic Crystals**  
*Photonic Crystals, Spring 2017*
    - **Supervisor:** Dr. Hamidreza Habibiyan
  - **Metasurfaces: Planar metamaterials enabling spatially varying optical responses**  
*Special Topics (Metamaterials), Spring 2017*
    - **Supervisor:** Dr. Amir Jafargholi
  - **Perfect Electromagnetic Conductor (PEMC) concept, applications, and implementations**  
*Special Topics (Metamaterials), Spring 2017*
    - **Supervisor:** Dr. Amir Jafargholi
  - **An Introduction to Chemical Lasers and their specifications**  
*Laser I, Fall 2016*
    - **Supervisor:** Prof. Parviz Parvin
  - **Near Field Antennas: RFID, NFC and Wireless charging antennas**  
*Antenna I, Spring 2015*
    - **Supervisor:** Dr. Pejman Rezaei
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## Skills

- **Languages:**
  - Native in **Persian**
  - Proficient with **English:** TOEFL score: **101** (Reading: 28, Listening: 26, Speaking: 23, Writing: 24)
- **Technical:**
  - **Programming Languages:** C, C++, Java, Javascript, MATLAB, PHP, Python, VHDL
  - **Type Setting:** L<sup>A</sup>T<sub>E</sub>X, Markdown (MD), Microsoft Office, HTML+CSS
  - **Embedded Systems:** Raspberry Pi, AVR, PowerPC, MicroBlaze
  - **Tools:** Bash, Git, Mercurial, Networking, Virtualization
  - **Technologies:** FPGA, CPLD, VoIP Protocol, Android Development, Linux Systems Administration
  - **Operating Systems:** GNU/Linux (\*nix), Microsoft Windows
  - **Softwares:** CST Studio Suite, RSoft, Lumerical, MATLAB and Simulink, Keysight ADS, Xilinx ISE & EDK, HSpice, OrCAD PSpice, Altera Quartus II, Altium Designer, CodeVision AVR, Proteus

- **Experimental:**

- **Optical:** Guiding Devices & Filters (Lenses, Polarizers, Beam Splitters, Diffraction Gratings, etc.), Detectors & Measurement Devices (Interferometers, Spectrophotometers, Polarimeters, PIN diodes, CCD sensors, etc.), Lasers & Spectroscopy techniques (LIBS, LIF, etc.)
  - **Electrical:** General Passive & Active components (Diodes, Transistors, Logical gates, Amplifiers, etc.), Signal generators, Oscilloscopes, Modulators, Spectrum Analyzers, RF Signal Generators, Microwave Waveguides, Couplers, Splitters.
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## Certifications

- **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)*
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## Volunteer Works

- **Students' Scientific Association of Electrical Engineering Monthly Magazine** 2014  
*Semnan University — Semnan — Iran*
    - Published several technical articles and provided other forms of related contents.
    - Contributed with Magazine Editorial board.
    - Designed several graphic banners for related campus events and magazine first pages
  - **Open Source Activist**
    - Released **B.Sc Project** as an Open Source Xilinx IP Core under MIT License. Check Academic Projects section for more details.
    - Released Arta Content Management Framework as an Open Source project licensed under GPLv3 with over **150,000 lines** of code. Check Work Experiences section for more details.
    - Several other Open Source projects are available on my **GitHub** at [github.com/zxcmehran](https://github.com/zxcmehran).
  - **Community Activist**
    - Minor contributions on English and Persian Wikipedia.
    - Local Google Maps Contributor. Invited to be a Local Guide by Google Maps Team.
    - Active in Stack Overflow and other Stack Exchange websites
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## Other Interests

DIYs, Hiking, Swimming, Skiing, Online Gaming

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## References

- **Prof. Parviz Parvin , [parvin@aut.ac.ir](mailto:parvin@aut.ac.ir)**  
*Professor, Department of Energy Engineering and Physics, Amirkabir University of Technology*
  - Prof. Parvin is an OSA Senior member, Deputy of Energy and Physics Department and The Dean of Photonics Engineering group. He was my M.Sc thesis supervisor. I've also passed several courses with him including Laser (4/4) and Laser Spectroscopy (4/4).
- **Dr. Amir Jafargholi , [ajafargholi@aut.ac.ir](mailto:ajafargholi@aut.ac.ir)**  
*Assistant Professor, Department of Energy Engineering and Physics, Amirkabir University of Technology*
  - Dr. Jafargholi has received his PhD degree in Electrical & Communication Engineering (Fields & Waves). He is the Principal Investigator of **Electromagnetic And Antenna Lab**. He was also my M.Sc thesis co-supervisor. I have had TA, RA, and several courses with him, including Special Topics in Photonics Engineering (Metamaterials) (4/4)
- **Dr. Hamidreza Habibiyan , [habibiyan@aut.ac.ir](mailto:habibiyan@aut.ac.ir)**  
*Assistant Professor, Department of Energy Engineering and Physics, Amirkabir University of Technology*
  - Had several courses with him including Photonics (I) (4/4), Photonic Crystals (4/4) and Seminar (4/4).
- **Dr. Hamid Meghdadi Neyshabouri , [meghdadi@semnan.ac.ir](mailto:meghdadi@semnan.ac.ir)**  
*Assistant Professor, Faculty of Electrical and Computer Engineering, Semnan University*
  - Dr. Meghdadi was my B.Sc. project supervisor. I have also passed several courses with him, including Digital Circuits Lab with a score of (4/4).

Last Update: March 2019