



PERSONAL INFORMATION

Surname: Ghorbanzadeh
Name: Mostafa
Gender: Male
Nationality: Iranian
Date of Birth: January, 17, 1987

Current Address

Department of Electrical & Computer Engineering
Hakim Sabzevari University (HSU)
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RESEARCH INTERESTS:

- Optoelectronics
 - Simulation and modeling of optical and electrical properties of nanostructures.
 - Simulation, fabrication, and characterization of structures based on near-field optical forces for manipulation of micro- and nano-particles.
 - Plasmonic effects, (plasmofluidics, and plasmonic tweezers).
 - Simulation and Fabrication of Solar Cells, LEDs and LASERS.
 - Simulation and Fabrication of Infrared photodetectors.
- Device characterization
 - Surface and Interface Characterization.
- Design and Fabrication of micro-electro-mechanical systems (MEMS) and Bio-MEMS.
- Design and fabrication of Power Transistors.
- Solid state physics.
 - Simulation and modeling of GNR-FETs
 - Spintronics and spin-polarized transport in nanostructures

CURRENT POSITION:



2016 – until now.....Hakim Sabzevari University, Sabzevar, Iran
Assistant Professor in Electronics, Electrical Engineering

EDUCATIONS:



Jan. 2016 – July 2016.....University of Victoria, Victoria, BC, Canada
Visiting research student in Electronics, Electrical Engineering
Research title: *Enhancement of Sensing/Trapping Efficiency of DNH Apertures*
Supervisor: Prof. Reuven Gordon



Fall 2012 – Oct. 2016.....Tarbiat Modares University, Tehran, Iran
Ph.D. in Semiconductor Devices, Electronics, Electrical Engineering
Thesis: *Manipulation of Micro and Nanoparticles by Near-field Optical Forces* (score: 20/20)
Supervisor: Prof. Mohammad Kazem Moravvej-Farshi
GPA: 19.17/20



Fall 2010 - Sept. 2012.....University of Tehran, Tehran, Iran
M.S. in Semiconductor Devices, Electronics, Electrical Engineering
Thesis: *Investigation and study of InSb Focal Plane Arrays* (score: 20/20)
Supervisor: Prof. Morteza Fathipour
GPA: 18.52/20



Fall 2005 - Sept. 2009.....Ferdowsi University of Mashhad, Mashhad, Iran
B.S. in Electronics, Electrical Engineering
Thesis: *Design and Implementation of a Wireless Sensor Network* (score: 20/20)
Supervisor: Prof. Mohammad Maymandi-Nejad
GPA: 16.39/20

Honors

- **Ranked** 13th in nationwide PhD entrance exam in 2012.
- **Ranked** 135th in nationwide M.Sc. entrance exam in 2010.

RESEARCH EXPERIENCES, PRACTICAL TASKS, AND PRESENTATIONS:

- Presentation on: Graphene based plasmonic tweezers, *September 2015*
- Presentation on: Single-particle optical trapping and unfolding system based on surface Plasmon Polaritons: Application in Cancer Diagnosis, *February 2015*
- Presentation on: Leaky plasmonic modes: excitation and propagation, *August 2014*
- Presentation on: Trapping and rotating of nanoparticles by means of ring resonators, *February 2014*
- Presentation on: Engineering of nano-particle trapping with Plasmonic effects, *August 2013*
- Presentation on: An Investigation into Graphene Synthesis Methods, *July 2013*
- Investigation of a quantum model for light emission performance of carbon nanotube field effect transistors, (*course name: Optoelectronics II*), *June 2013*
- Presentation on: Semiconductor optical nonlinearities, (Plasma screening, Exciton ionization, Bandfilling, Bandgap renormalization, Thermal nonlinearities, two photon absorption), *May 2013*
- Presentation on: Investigation and Study of Spintronics and SpinFETs, *February 2013*
- Presentation on: Quantum transport equations (*course name: Quantum transport*), *December 2012*
- Writing a Code to extract interface trap densities using MOS C-V measurement, *December 2012*
- Simulation of avalanche breakdown voltage in AlGaIn/GaN HEMT, *November 2012*
- Simulation of InSb-FPA-infrared photo detector (*master's dissertation*), *2011-2012*
- Simulation of an Infrared Photodetector with SGframework, *June 2012*
- Studying the structure of Quantum well and Quantum Dot infrared photodetectors, *January 2012*
- Designing the structure and fabrication process of a MOSFET and High Electron Mobility Transistors (HEMT), *June 2011*
- Designing a simple pressure sensor, *June 2011*
- Studying the band structure of Carbon Nanotube and graphene sheets, *January 2011*
- Calculating the E-K dispersion, using Tight Binding Method, *December 2010*
- Designing and Implementation of a Wireless Sensor Network, (*bachelor's dissertation*)
- Implementation of I2C Protocol, (*undergraduate*)
- RS485 communication protocol designed to control a set of light bulbs, (*Course Name: Training*).
- Designing a graphical user interface in order to access to the USB port of computer, (*undergraduate*)
- Designing of PCB (printed circuit board) for multiple circuits, (*undergraduate*).

JOURNAL PUBLICATIONS:

- 1) **M. Ghorbanzadeh**, “Numerical investigation of a bidirectionally tunable, nanometer-precision, and compact tweezers for screening gold nanoparticles,” *J. Opt. Soc. Am. B*, vol. 38, no. 4, 2021 (IF: 2.180).
- 2) P. Alibeigloo, **M. Ghorbanzadeh**, and M. K. Moravvej-Farshi, “Repositioning of plasmonic hotspots along the sidewalls of conical nanoholes: a numerical investigation,” *OSA Contin.*, vol. 3, no. 10, p. 2817, 2020.
- 3) **M. Ghorbanzadeh**, “Numerical investigation of high-speed electrically reconfigurable plasmofluidic channels for particle manipulation,” *J. Opt. Soc. Am. B*, vol. 37, no. 10, p. 2830, 2020 (IF: 2.180).
- 4) **M. Ghorbanzadeh** and S. Darbari, “Efficient Plasmonic 2D Arrangement and Manipulation System, Suitable for Controlling Particle–Particle Interactions,” *J. Light. Technol.*, vol. 37, no. 9, pp. 2058–2064, 2019 (IF: 4.288).
- 5) **M. Ghorbanzadeh**, Steven Jones, MK. Moravvej-Farshi, and Reuven Gordon “Improvement of Sensing and Trapping Efficiency of Double Nanohole Apertures via Enhancing the Wedge Plasmon Polariton Modes with Tapered Cusps”, *ACS Photonics*, 2017 (IF: 6.756).

- 6) **M. Ghorbanzadeh**, MK. Moravvej-Farshi, and S. Darbari, "Plasmonic Optophoresis for Manipulating, In Situ Position Monitoring, Sensing, and 3-D trapping of Micro/Nanoparticles," *IEEE Journal of Selected Topics in Quantum Electronics*, vol. 23, no. 2, p. 5500208, 2016 (IF: 3.466).
- 7) **M. Ghorbanzadeh**, S. Darbari, and MK. Moravvej-Farshi, "Graphene-based Plasmonic Force Switch," *Applied Physics Letters*, vol. 108, no. 12, 2016 (IF: 3.293).
- 8) **M. Ghorbanzadeh**, MK. Moravvej-Farshi, and S. Darbari, "Designing a Plasmonic Optophoresis System for Trapping and Simultaneous Sorting/Counting of Micro- and Nano-particles," *Journal of Lightwave Technology (IEEE/OSA)*, vol. 33, no. 16, pp. 3453 - 3460, 2015 (IF: 2.965).

CONFERENCE PAPERS:

- 1) **M. Ghorbanzadeh**, "Electrically Tunable Passive Plasmonic Screening of Gold Nanoparticles Using a Graphene Sheet", *7th International Conference on Nanostructures (ICNS7) 27Feb- 1 Mar 2018, Tehran, Iran*
- 2) **M. Ghorbanzadeh**, "Efficient Excitation of Stripe-based Leaky Surface Plasmon Polaritons in the Kretschmann Configuration", *The 5th International Conference on Electrical Engineering and Computer with emphasis on native knowledge (IEEEEC), 2017, Tehran, Iran.*
- 3) **M. Ghorbanzadeh**, "Investigation the Effect of Conjugated Gold Nanoparticles on a Cell Membrane for Efficient Light Scattering", *The 5th International Conference on Electrical Engineering and Computer with emphasis on native knowledge (IEEEEC), 2017, Tehran, Iran.*
- 4) **M. Ghorbanzadeh**, "Stripe-based Plasmofluidic Tweezers for Single Cell Manipulating and Sensing Applications", *Nanomedicine & Nanosafety Conference (NMNS 2017), Tehran, Iran.*
- 5) **M. Ghorbanzadeh**, S. Darbari, MK. Moravvej-Farshi, "Single-particle optical trapping and unfolding system based on surface Plasmon Polaritons for application in cancer diagnosis," *Asian Nano Forum Conference (ANFC2015)*, pp. 24-25, 2015.
- 6) M. Asad, M. H. Sheikhi, and **M. Ghorbanzadeh**, "Effect of Surface Treatment by Helium Plasma on the Electrical Properties of Ohmic Contact to Chemical Bath Deposition PbS Photodetectors," *The 2nd Asian Symposium on Electromagnetics and Photonics Engineering*, pp. 28–31, 2013.
- 7) M. Fathipour, H. Ghasri, **M. Ghorbanzadeh**, P. Vahdani, "Investigation of Ion Implantation Method for InSb-FPA Fabrication," *21th Iranian Conference on Electrical Engineering (ICEE 2013)*, May 2013 (In Persian).
- 8) **M. Ghorbanzadeh**, M. Fathipour, M. Asad, "Dark Current Components in InSb Infrared Photodetectors," *21th Iranian Conference on Electrical Engineering (ICEE 2013)*, May 2013 (In Persian).
- 9) **M. Ghorbanzadeh**, M. Asad, V. Fathipour, M. Fathipour, "The Impact of Fixed Oxide Charge Density on the Performance of InSb Infrared Focal Plane Arrays," *11th international conference on Infrared Optoelectronics: Materials and Devices (MIOMD-XI Northwestern University, USA)*, September 2012.
- 10) M. Asad, **M. Ghorbanzadeh**, Gh. Sareminia, M. Fathipour, "Investigation of optimum junction depth of InSb Infrared Photodiode," *20th Iranian Conference on Electrical Engineering (ICEE)*, pp.260-262, 15-17 May 2012.

LANGUAGE PROFICIENCY

- Persian: Native
- English: Good

TEACHING EXPERIENCE:

2018- until now, Teacher (**Quantum Electronics**), Hakim Sabzevari University, Sabzevar.

2017- until now, Teacher (**Optical Integrated Circuits**), Hakim Sabzevari University, Sabzevar.
2017- until now, Teacher (**Low power integrated circuits**), Hakim Sabzevari University, Sabzevar.
2017- until now, Teacher (**Optoelectronics**), Hakim Sabzevari University, Sabzevar.
2017- until now, Teacher (**Electronics I, II, and III**), Hakim Sabzevari University, Sabzevar.
2017- until now, Teacher (**C++ Programming Language**), Hakim Sabzevari University, Sabzevar.
2013- 2014, Teacher (**Electrical circuits I**), Islamic Azad University South Tehran Branch, Tehran.
2013- 2014, Teacher (**Electronic III, Lab**), Islamic Azad University South Tehran Branch, Tehran.
2013- 2014, Teacher (**Electronic circuits, Lab**), Islamic Azad University South Tehran Branch, Tehran.
Sep. 2008- Jan. 2008, Teaching Assistant (**engineering mathematics**), Bahar University, Mashhad.

COMPUTER SKILLS:

- Programming Languages
 - **Matlab**, C/C++,
- CAD Tools and Simulators
 - **Silvaco Device Simulator (Atlas/Athena)**, **Lumerical (FDTD/MODE/DEVICE)**, **Intellisuite**, **SGframework**, Orcad PSPICE, Proteus, Visual Basic, Codevision, BASCOM-AVR, Protel DXP,
- Operating Systems, Microsoft Office and Other
 - Windows 7/2000/XP, **Linux**
 - Word, PowerPoint, Excel, **LATEX**, **Adobe Photoshop CS6**

REFERENCES:

- **Reuven Gordon, Professor**
University of Victoria, Email: rgordon@uvic.ca
- **MK. Moravvej-Farshi, Professor**
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