

# MASOUD BERAHMAN

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Sharif University of Technology

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## EDUCATION

[September 2016-]

### **Sharif University of Technology**

**Post-Doc** in Electrical/Material Eng. Department, nano-electronics

[September 2014-  
September 2016]

### **Sharif University of Technology**

**Post-Doc** in Nano-physics

[September 2010-  
September 2014]

### **Shiraz University**

**Ph.D.** in Electrical Engineering

Thesis Title: Simulation and Design of Hydrogen Sulfide Gas Sensor based on Carbon Nanotubes. (**With Honor**) (First Rank)

[September 2008-  
September 2010]

### **Shiraz University (transferred)**

**Master in** Electrical Engineering

Thesis Title: "Optical properties of Bilayer Graphene Nanoribbon and effect of finite length on its properties" (**With Honor**) (First Rank)

[September 2003 –  
January 2008]

### **Shiraz University**

**Bachelor** in Electrical Engineering

Final Project: "Fabrication of Graphene using Scotch tape" (**Best Final Project among bachelor students.**)

## RESEARCH INTERESTS

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Gas Sensors based on novel 2D-materials, Electronic and Transport Properties of 2-Dimensional Nanostructures, Thin Film Transistors, Carbon Nanotube and Graphene Family, Optical properties of nanostructures, Gas sensors based on capacitance and step response.

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## PATENTS

1. Surface Acoustic Wave (SAW) Structure as H<sub>2</sub>S Gas Sensor IR-Patent No: **13915094000303175**
2. H<sub>2</sub>S Gas Sensor Based on Carbon Nanotube Thin Film, IR-Patent No:**13915094000302787**
3. High sensitive H<sub>2</sub>S Gas Sensor based on Capacitance properties of Carbon Nanotube Thin Films, IR-Patent: **Under Review**.

## PUBLICATION

### [JOURNALS]

1. **M. Berahman**, M. H Sheikhi, “*Electrical properties of finite length Graphene Nanoribbons in an electric field*”, **Journal of Computational and Theoretical Nanoscience (CTN)**, 2011.
2. **M. Berahman**, M. H Sheikhi, “*Optical excitation of finite length Graphene Nanoribbons*” **Journal of Computational and Theoretical Nanoscience** Volume 8, Number 1, January 2011 , pp. 90-96(7)
3. **M. Berahman**, M.H.Sheikhi, M. OrvatiNia, “*Analytical Approach to Optical properties of Graphene Nanoribbons in Transverse Electric Field*” Accepted in **Journal of Computational and Theoretical Nanoscience (CTN)** 2013
4. A. Salmanpour, M.H. Sheikhi, A. Zarifkar, **M. Berahman**, “*A novel equivalent circuit model for waveguide-separated absorption charge multiplication-avalanche photodetector (WG-SACM-APD )*”**Optik - International Journal for Light and Electron Optics**, Volume 124, Issue 23, December 2013, Pages 6154–6158
5. **M. Berahman**, M. Sanaee, R. Ghayour, “*A theoretical investigation on the transport properties of overlapped graphene nanoribbons*” , **Carbon**, Volume 75, August 2014, Pages 411-419(Impact Factor = 6.16)
6. **M. Berahman**, M. H. Sheikhi “*Transport Properties of ZIGZAG Graphene Nanoribbon decorated with Copper Clusters*”**Journal of Applied Physics**, 116, 093701 (2014) (Cover of Journal).
7. **M. Berahman**, S Sharifpour, H Nadgaran, “*Investigation on Optical Properties of Bilayer Graphene Nanoribbons*” doi: 10.1007/s11082-014-0085-y, **Optical and Quantum Electronics**, 2014

8. **M. Berahman**, M. H. Sheikhi, A Zarifkar, H Nadgaran, “Structural and electronic properties of zigzag graphene nanoribbon decorated with copper cluster”, **Journal of Computational Electronics**, Volume 14, Issue 1, pp 270-279, 2015.

9. **M. Berahman**, M. H. Sheikhi, “Hydrogen Sulfide gas sensor based on decorated zigzag graphene nanoribbon with copper”, **Sensors and Actuators B**, Vol 219, Pages 338–345, 2015.

10. **M. Berahman**, A. Asad, M. Sanaee, M. H. Sheikhi, “Optical Properties of Chiral Graphene Nanoribbons: a First Principle Study”, **Optical and Quantum Electronics**, Vol 47, Issue 10, pp 3289-3300, 2015.

11. N. Khadempour, H. Alipour, **M. Berahman**, A. Yazdan panah gohar rizi, M. Jabbari, “Sensitive DNA detection based on the capacitance properties of graphene”, **Journal of Computational Electronics**, September 2016, Volume 15, Issue 3, pp 898–909.

12. F. Zakerian, **M. Berahman**, “Optical properties of defected silicene: the many-body approach”, **Optical and Quantum Electronics**, 48, 370,1-7, 2016.

13. N. Khadempour, **M. Berahman**, A. Yazdanpanah Goharrizi, “Deciphering the electric field changes in the channel of an open quantum system to detect DNA nucleobases”, *Journal of Computational Electronics*, Volume 16, Issue 2, pp 411–418 June 2017.

14. M. Barzegar, **M Berahman**, A. Iraji zad, “Sensing behavior of flower-shaped MoS<sub>2</sub> nanoflakes: case study with methanol and xylene”, *Beilstein J. Nanotechnol.* 9, 608–615, 2018

15. **M Berahman**, “A Theoretical Investigation on Decorated Graphene Nanoribbon/Silicon Schottky Diode as Hydrogen Sulfide Gas Sensor” 17th Iranian Physical Chemistry Conference, 2014.

16. A Zarifkar, S. Sedaghat, **M Berahman**, “Analysis of the optical properties of self-assembled pyramidal InAs/GaAs quantum dot using the extended Huckel tight binding method” 21th Iran Conference on Optic and Photonic, 2014, Shiraz, Iran.

[CONFERENCES]

17. **M Berahman**, M H Sheikhi, A. Zarifkar, R Gebauer, M Taheri, M Asad, “*H<sub>2</sub>S Gas Sensor Based on Thin Film Graphene Nanoribbons Decorated with Copper: A First Principles Study*”, UFGNSM 2013, Tehran, Iran (1 cited)
18. **M Berahman**, M H Sheikhi, A Zarifkar, M Taheri, “Effects of single walled carbon nanotube defects and alignment angles on percolation conductivity in carbon nanotubes thin film” 21th Iranian Conference on Electric Engineering 2013, Mashhad, Iran. (2 cited)
19. M Asad, Sh Bahreini **M Berahman** M Daraee M Fathipour M H Sheikhi, “*H<sub>2</sub>S Gas Sensor Based on SAW-CNTs*”, International congress on Nanoscience& Nanotechnology (ICNN2012) 8-10 September 2012 Kashan, Iran.
20. **M. Berahman**, M.H. Sheikhi, “*Dielectric and Refractive Index of Graphene Nanoribbons: An Analytical Approach*” International Congress and Nanoscience and Nanotechnology 9-11 November 2010, Shiraz, Iran.
21. M. H Sheikhi, **M.Berahman**, R Alaei, “*Physical model of Photo detector Based on Graphene Nanoribbon in an Electric Field*” ,China nano 2009, Beijing, China.
22. **M. Berahman**, et al. ,”*Electrical and Optical Properties of AB-stacked Bilayer Graphene Nanoribbon*”, China Nano 2009, Beijing, China.
23. **M.Berahman**, M. H. Sheikhi “*Optical properties of finite length graphene nanoribbons in an electric field*” NanoToday 2009
24. M. H Sheikhi, **M. Berahman**, R Alaei, “*The Numerical Modeling for Electrical Behavior of Graphene Nanoribbon in the Present of Optical Detection*” , ICCEE 2009, Dubai.
25. **M. Berahman**, M. H. Sheikhi, “*Electronic Properties of Finite Length Graphene Nanoribbons in an Electric Field*” Iran Conference of Electric and Electrical engineering (ICEE),(2009),Tehran, Iran.
26. **M.Berahman**, H. Sheikhi “ *Novel Theoretical Calculation on surface states of finite length graphene nanoribbons*” International Symposium on Surface science and Nanotechnology, japan.2008
27. M. H. Sheikhi, **M. Berahman**, “*A New Formulation for Simulation of Carbon Nanotubes Array Field Emission Characteristics*”<sup>1st</sup> Southern Iran Nanotechnology Conference, Shiraz, Iran. 2007.

[GRANTS  
AND  
AWARDS]

28. M. Berahman, S. Jalili, “Transport properties of Armchair phosphorene nanoribbon field effect transistor” (Grammar and Spell Check).
29. M. Berahman, A. Irajizad, “ Effect of Edge Functionalization on Alternating Current Response of Zigzag Graphene Nanoribbon” (Submitted)
30. M. Berahman, S Karimi, “Simulation of High sensitive CH<sub>4</sub> Gas Sensor based on functionalized Carbon Nanotube”(Grammar and Spell Check)
31. M. Barzegar, M. Berahman, A. Irajizad, “Direction control CVD growth of 2D MoS<sub>2</sub> monolaye” (Submitted).
32. M. Berahman, F. Ghasempour, A. Irajizad, “Gas sensing of graphene nanoribbon thin film decorated with MoS<sub>2</sub> nanosheets” (Draft)
33. M. Berahman, F. Ghasempour, A. Irajizad, “Capacitance based gas sensor using decorated graphene nanoribbon” (Draft).

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- **No 1 in PhD Degree, 2014**
  - **No. 1** among 30 students in **Master Degree, 2010**
  
  - Accept in **Iran's National Elites Foundation** because of outstanding achievement in Master Degree. 2010
  
  - Granted as **Junior Young researcher** to visit **International Centre for Theoretical Physics (ICTP), Trieste. Italy** in2011.
  
  - **First Rank in Persian Gulf Innovations exhibition ,2012**
  
  - Accept in **Iran's National Elites Foundation (second time)** because of outstanding achievement in Innovations exhibitions.2012
  
  - Granted as **Young researcher** to visit **International Centre for Theoretical Physics (ICTP) Trieste. Italy** in2012.
  
  - **Best researcher in** Electronic Department2013, **Islamic Azad University branch of Sepidan.**

## TEACHING EXPERIENCES

[Fall 2013]

- **Iran's National Elites Foundation's Award 2013, 3000\$** for gas sensor.

[Spring 2012]

- **Azad University Grant** for “Design of Methane Gas Sensor based on functionalized Carbon Nanotube”, 2013

- **Azad University Grant** for “Optical properties of two-dimensional structures based on Bethe -Salpeter equation”,. 2013

[Fall 2012]

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**Azad University branch of Sepidan, (To Master Students)**

[Fall 2013]

**Teacher of Master Students, Electrical Engineering, Course: Physics of Semiconductor Device I, Advanced Analog Circuit Design I.**

[Fall 2013]

**Teacher of Master Students, Electrical Engineering, Course: Quantum Electronic I, Advanced Analog Circuit Design II.**

[Fall 2012]

**Teacher of Master Students, Electrical Engineering, Course: Quantum Electronic I, Physics of Semiconductor Device I.**

[Spring 2011]

**Shiraz University (To Bachelor Students)**

[Fall 2011]

**Teacher of Bachelor Students, Electrical Engineering, Course: Electronic Lab III**

[Invited Teacher]

**Teacher of Bachelor Students, Electrical Engineering, Course: Digital Circuit Design**

[Advisor]

**Teacher of Bachelor Students, Electrical Engineering, Course: Electronic Lab III, Circuit Lab I**

**Teacher of Bachelor Students, Electrical Engineering, Course: Electronic Lab I, Circuit Lab I.**

**Summer School, Shiraz University, Course: Nano-electronic**

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[INDUSTRIAL  
PROJECTS& OTHER  
PROJECTS]

**1. Bachelor Final Project** entitles: “**Effect of Sputtering on defects of Carbon Nanotube**” In this project we design a home-made Simple Sputtering. Fall 2012

**2. Bachelor Final Project** entitles : “ Effect of alignment on the resistance of Junction Graphene Nanoribbon in DFTB approximation” Fall2012

**3. Bachelor Final Project** entitles: “Experimental Investigation on effect of orientation on conductance of thin film Carbon Nanotubes.” Fall 2013.

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**4.** Fabrication of resistance and capacitance based thin film carbon nanotube transistor decorated with silver for hydrogen detection.

**5.** Design and Fabrication of LiBNO<sub>3</sub> SAW structures for Wireless technology.

**6.** Writing Matlab based home-made software to investigate Gas Sensors based on pristine or decorated thin film carbon nanotube and graphene nanoribbons ( 2000 lines)

**7.** Design and Fabrication of cheap Home-Made Sputtering for Polluted materials like Carbon Nanotubes.

**MEMBERSHIP**

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- Member of **Elite National Foundation of IRAN**, 2010-present.
  - IEEE student membership, 2011-present.
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I designed and assemble four CVDs and a sputtering system during my Postdoc. In addition I design and fabricate a potable LRC meter for live gas sensing detection.

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**TECHNICAL  
SKILLS**

- Sputtering
- E-Beam Evaporation
- UV/ Vis/IR Spectroscopy
- Atomistic Force Microscopy , scanning tunneling spectroscopy
- Plasma Enhanced Chemical Vapor Deposition