Foozieh Sohrabi

Researcher, Project planner

Contact

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Summary

I am a highly-motivated, fresh researcher with a vision to apply optical tools for highly-resolved sensing/spectroscopy/imaging applications. My main goal is to develop biosensor technologies for point-of-care and therapeutic devices. My training was focused on nanotechnology mainly the design, fabrication, characterization and optimization of photonic devices. My research experiences provide me a multi-disciplinary perspective toward various aspects of biophotonics and optical sensors. Working on high technology and cutting-edge fields develops me strongly in skills like leadership, communication, management and problem solving

Experience

Researcher/Postdoctoral Research Fellow

Fellowship from Iran's National Elites Foundation (international.bmn.ir)
Shahid Beheshti University (www.sbu.ac.ir/Res/lapri)
Sector: Shahid Beheshti University/ Magnetoplasmonic Laboratory (http://magnetoplasmonics.sbu.ac.ir)
July 2019 to October 2019 (Researcher), Tehran, Iran
October 2019 – Now (Postdoctoral Research Fellow), Tehran, Iran

- Early detection of blood cancer & immune system diseases using phase-sensitive measurement of biological samples
- Monitoring and reporting progress
- Review of Technical Proposals, preparing RFP and use of resources, initiating corrective action where necessary
- Chiral sensing: Cancer detection at the early stage

Contact: Contact: Dr. Seyedeh Mehri Hamidi, Email: m_hamidi@sbu.ac.ir, Tel.: +982129904016

Intern and Visiting Researcher

École Polytechnique Fédérale de Lausanne (EPFL) (www.epfl.ch)
Sector: Bionanophotonic Systems Laboratory (BIOS)
March 2017 to August 2018 (1 year and 6 months), Lausanne, Switzerland

- Working on biophysical features of the cultured cells like primary hippocampal neurons, neuroblastoma SH-SY5Y cells, and human embryonic kidney 293 (cancer-type HEK293) using optical techniques
- Optical neural signal activity detection using plasmonic-ellipsometry
- Sensor design using simulation software (e.g. FDTD solutions & CST software)
- Chip fabrication (e.g. soft lithography, e-beam lithography, photolithography, dry and wet etch platforms) in CMi (Center of MicroNanoTechnology): 1D & 2D nano and micro structures
- Chiral sensing based on hybrid/ dielectric structures (ULTRACHIRAL H2020)
- Detection and sensing of biomolecule binding of AG/IgG bilayer proteins
- Optical characterization of the sensing chips
- Professional data analysis
- Upgrading/ optimizing the detection system in an innovative fashion to satisfy the requirements
- Microfluidics/ lab-on-chip design and fabrication
- Networking and creating close-knit with collaborators in Brain Mind Institute (BMI)

Contact: Dr. Hatice Altug, Associate professor at EPFL, Email: hatice.altug@epfl.ch; Website: http://bios.epfl.ch/, Tel.: +41 216931170, +41 216931180

Lab and Cleanroom

Open optics
Surface plasmon resonance setups, Circular-dichroism (chirality) setups, Ellipsometry setups

Fabrication techniques
Soft lithography, Ebeam lithography, Photolithography, Dry and wet etch platforms, Sputtering

Microfluidics and PDMS line

Microscopy based measurements/Metrology
Scanning electron microscopy (SEM) Zeiss LEO 1550, Nikon inverse microscopy, Bruker Fourier-transform infrared (FTIR) spectroscopy, Bruker atomic force microscopy (AFM), Bruker Dektak XT surface profiler, Sopra GES 5E spectroscopic ellipsometer, Zeiss Axio Scope.A1 phase contrast/fluorescence microscope, Zeiss Stemi, UV/VIS spectrophotometer Rayleigh

Organic materials
Silk, Polydimethylsiloxane (PDMS), Polycarbonate

Biophysics Measurement
In vitro/in-vivo neural activity recording using optical systems in cell (HEK293,SH-SY5Y, hippocampal, Colon, HepG2 & Mesenchymal Stem Cells), tissue and worm scales, TENS, FES, EMG, NCS.

Training course in Royan Institute

- Bioinformatics and primer design
- Cell culture Experimental embryology in male/female mice
- Histology

Lecturing

- **Laboratory of fundamentals of physics 1**

Teaching assistant

- **Microfluidics, EPFL 2018**
- **Photonic crystals, SBU 2015-2017**

Subgroup Leader of Neuroplasmonics

Laser and Plasma Research Institute (LAPRI),
Shahid Beheshti University (www.sbu.ac.ir)
Sector: Magnetoplasmonic Laboratory
(http://magnetoplasmonics.sbu.ac.ir)
October 2015 – Now (3 years and 11 months), Tehran, Iran

- Management and planning of the projects
- Activity Sequencing and prioritizing the projects
- Process design
- Preparing the fabrication and optical measurement process flows
- Commenting the thesis of the group members
- Market evaluation for upcoming projects
- Coordinating and reporting progress of meetings and potential projects
- Management of potential projects worldwide
- Wrote reports and presented findings
- Knowledge management according to medical demands
- Prepared proposals for R&D on Neuroplasmonics
- Main master projects:
  - Ms Tannaz Shad: Nicotine detection by utilizing transparent neuroplasmonic sensor
  - Ms Sajedeh Saeidifard: Fabrication of two-dimensional plasmonic biosensor as detector of laser stimulation of mouse cell
  - Mr Mohsen Kiyayi: Pressure sensor based on organic/plasmonic structure
  - Ms Mona Zahednamazi: Photonic crystal power combiner based on hexagonal waveguides
  - Mr Mazhdi & Mr Hamzehzadeh: ongoing

Contact: Dr. Seyedeh Mehri Hamidi, Associate professor of laser and plasma research institute, Email: m_hamidi@sbu.ac.ir, Tel.: +982129904016

Research Assistant

Laser and Plasma Research Institute (LAPRI) (www.sbu.ac.ir/Res/lapri) , Shahid Beheshti University (www.sbu.ac.ir)
Sector: Magnetoplasmonic Laboratory
(http://magnetoplasmonics.sbu.ac.ir)
October 2013 to July 2019 (5 years and 8 months), Tehran, Iran

- Mounting VIS-NIR open-optic spectroscopic setups
- Microscopy-based measurements (Phase contrast, etc.)
- Circular dichroism in gold/PMMA (RB) complex
- Structure design using FDTD Solutions, CST softwares and RSoft designs
- Magneto-optical effects in micro-patterned Au/Co/Au structures
- Optically investigating neural signals under various stimulation methods (i.e. electrical, chemical and infrared stimulation techniques) for cell (HepG2, Mesenchymal stem cells, fibroblast, etc.), tissue (cerebellum) and in vivo (earthworm)

Contact: Dr. Seyedeh Mehri Hamidi, Associate professor of laser and plasma research institute, Email: m_hamidi@sbu.ac.ir, Tel.: +982129904016

IT skills

Professional software:
- FDTD Solutions (Lumerical Inc),
- CST Microwave Studio®,
- RSoft Design

Programming:
- MATLAB,
- Python

Graphics: Blender

Other Applied Software:
- Microsoft Project,
- Primavera Project Management,
- Origin,
- LaTex

Database: SQL server (Basic)
Other (Basic): A+ (OS), C#. Net

Language proficiency

English: Full professional proficiency (TOEFL score: 92)
French: Upper-intermediate (DELF B1)
German: Limited working proficiency
Turkish, Azari, Persian: Native

Area of interests

- Optical sensors
- Biophotonics
- Optical spectroscopy

Skills/ Expertise

- Laboratory skills
- Point-of-care devices
- Open-optic setup
- Project Management and Planning
- Business Plan/Patent (Beginning level)
- Research and Development
- Preparing RFP
- Technical reports
- Research Analyst
- Analytical Skills
- Team working
- Communication

Education

EPFL (École Polytechnique Fédérale de Lausanne)
Doctoral visiting student, Bionanophotonic Systems Laboratory, March 2017-August 2018.

Shahid Beheshti University
Doctor of Philosophy – PhD, Photonics . (2013-2019)
Exceptional talent acceptation
Dissertation: *Design and Optimization of a Sensor based on Plasmonics for Neuroscience Application*

University of Tabriz
Master's degree– MSc, Photonics Engineering . (2011-2013)
Exceptional talent acceptation
Thesis: *Investigating Charge Transport in Solar Cells based on Silicon Quantum Dots*

University of Tabriz
Bachelor's degree– B.S., Physics . (2007-2011)
Exceptional talent acceptation.

Research and Scientific Background

Citation acquired from Google Scholar database on 19 March 2020:
- *Total citation: 154 total citations, h-index: 8*
- *Published Peer-Reviewed Papers: 18, Conference Papers: 16, Book Chapters: 3*
- *Google Scholar:* https://scholar.google.com/citations?user=DrTvnM0AAAAJ&hl=en

Selected publications

F. Sohrabi and S. M. Hamidi. *Optical detection of brain activity using plasmonic ellipsometry technique*. Sensors and Actuators B: Chemical 2017, 251, 153-163.

F. Sohrabi et al. *Phase-sensitive optical neural recording of cerebellum tissue on a flexible interface*. Journal of Applied Physics 127.11: 113101.

F. Sohrabi and S. M. Hamidi, *Neuroplasmonics: From Kretschmann configuration to plasmonic crystals*. The European Physical Journal Plus 2016, 131 (7), 221.

F. Sohrabi, T. Mahinroosta, S. M. Hamidi, *Design of 1×3 power splitter based on photonic crystal ring resonator*. Optical Engineering. 53, 115104-115104 (2014).

Tsakmakidis, K. L., O. Reshef, E. Almpanis, G. P. Zouros, E. Mohammadi, D. Saadat, **F. Sohrabi**, N. Fahimi-Kashani, D. Etezadi, R. W. Boyd and H. Altug (2019). Ultrabroadband 3D invisibility with fast-light cloaks. Nature Communications 10(1): 4859.

N. Es'haghi Gorji, H. Movla, **F. Sohrabi**, A. Hosseinpour, M. Rezaei, and H. Babaei, *The effects of recombination lifetime on efficiency and J–V characteristics of InxGa1−xN/GaN quantum dot intermediate band solar cell*. Physica E: Low-dimensional Systems and Nanostructures. 42, 2353-2357 (2010)- (Rank 9 in TOP 25 Hottest Articles)

Membership

American Physical Society (APS)
2012-2013

IEEE woman in Engineering member 2012-2013

IEEE computer society member
2012-2013

IEEE advancing technology member 2012-2013

Nominated for American Chemical Society (ACS) membership, 2012

References

Prof. S. Mehri Hamidi
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Prof. Hatice Altug
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Prof. Kosmas L. Tsakmakidis
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Hobby

- Hiking/mountain climbing
- Nature photography

Honors & Awards

Marie S.-Curie Postdoctoral Fellowships in Photonics
2020, MULTIPLY call

Top Alumna Award
2019, Shahid Beheshti University, Iran

Top national doctoral thesis
2019, 2nd National Festival on Research Thesis, Khayyam Award, Iran

Acceptance for Professor Hessabi Thesis Prize (Excellent grade**)**
2019, Tehran, Iran

Member of Iran's National Elites Foundation (international.bmn.ir)
Iran

TOP25 Hottest Articles
July 2010 to Mars 2011, The Netherlands
Announced by the journal of "Physica E: Low-Dimensional Systems and Nanostructures", Elsevier, as top 25 hottest paper

Shahriyari Scholarship Award Winner
2017, Shahid Beheshti University, Iran

Scholarship Winner from Cognitive Sciences and Technologies Council
2017, Iran

Top researcher award
2017, Shahid Beheshti University, Iran

The best researcher award in 5th national HAREKAT festival
2012, University of Tabriz, Iran

Exceptional talents of Iran
2011-2019, University of Tabriz and Shahid Beheshti University, Iran

Distinguished Nanotechnology Paper Award
2010, Iranian Nanotechnology Initiative Council (INI), Iran

Projects

Design and optimization of third generation solar cells using quantum dots
2007-2013, University of Tabriz
Neuroplasmonics: Detection of neural signal activity in cell, tissue and in-vivo scales
2013-now, Shahid Beheshti University & EPFL
Chiral structure: Highly-resolved chiral biosensing
2014-2015, Shahid Beheshti University
Flexible plasmonic sensor for detection and classification of water contamination
2018-now, Shahid Beheshti Univesrity