Research Interests

My primary research and teaching interests involve:

* Biomedical Sensors
* BioMEMS
* Lab-on-a-chip / Organ-on-a-chip
* Microfabrication
* Biomaterials and cellular measurements
* Computer Programming and Machine Learning

Publications

**Journal Papers:**

1. M. Ashoorirad, R. Baghbani, M.B. Shadmehr, " Intraoperative Localization of Metal Fragment Remained in the Human Body Using Electrical Bioimpedance: a Feasibility Study", **IEEE Sensors Journal, DOI:**[10.1109/JSEN.2024.3364070](https://doi.org/10.1109/JSEN.2024.3364070), **2024**.
2. [Abbas Hamouleh- Alipour](https://www.researchgate.net/profile/Abbas-Alipour-3?utm_content=businessCard&utm_source=publicationDetail&rgutm_meta1=AC%3A16262788), [Shiva Khani](https://www.researchgate.net/profile/Shiva-Khani?utm_content=businessCard&utm_source=publicationDetail&rgutm_meta1=AC%3A15571597), **M. Ashoorirad**, R. Baghbani, "Trapped multimodal resonance in magnetic field enhancement and sensitive THz plasmon sensor

 for toxic materials accusation", **IEEE Sensors Journal**, Accepted, DOI:10.1109/JSEN.2023.3278321, **2023**.

1. R. Baghbani, **M. Ashoorirad**, F. Salemi, M.A. Laribi, M. Mostafapoor, " Design and Construction of a Wireless Robot that Simulates Head Movements in Cone Beam Computed Tomography Imaging ", **Robotica**, Cambridge University Press, **2022**.
2. R. Baghbani, **M. Ashoorirad**, " [Optimization of the Van Der Pauw Method for Measuring the Electrical Properties Spectrum of Biological Solutions](https://scholar.google.com/citations?view_op=view_citation&hl=en&user=ZP5OCWkAAAAJ&sortby=pubdate&citation_for_view=ZP5OCWkAAAAJ:Zph67rFs4hoC)", **IEEE Transactions on Instrumentation and Measurement**, Vol.71, pp. 1-8, **2022**.
3. **M. Ashoorirad**, R. Baghbani, A. Fallah; N. Jooyan, M. Gaffari, "A Collagen Thin Film-Based Bioimpedance Sensor for Cell Proliferation Rate Assessment", **IEEE Sensors Journal**, 22(1), pp. 61-67, **2022**.
4. R. Baghbani, M.B. Shadmehr, **M. Ashoorirad**, S.F. Molaeezadeh, M.H. Moradi "[Bioimpedance Spectroscopy Measurement and Classification of Lung Tissue to Identify Pulmonary Nodules](https://scholar.google.com/citations?view_op=view_citation&hl=en&user=ZP5OCWkAAAAJ&sortby=pubdate&citation_for_view=ZP5OCWkAAAAJ:MXK_kJrjxJIC)", **IEEE Transactions on Instrumentation and Measurement**, Vol. 70, pp. 1-8, **2021**.
5. **M. Ashoorirad**, R. Baghbani, M.R. Ghalamboran, " A bioimpedance sensor to detect water content in milk based on Van Der Pauw method ", **IET Nanobiotechnology**, Vol. 15, Issue 7, pp. 611-618, May **2021**.
6. **M. Ashoorirad**, A. Fallah, M. Saviz, " Measuring and assesment of impedance spectrum of collagen thin films in the presence of deionized water ", **Journal of Molecular Liquids**, Vol. 320, Part B, pp. 1-8, **2020**.
7. **M. Ashoorirad**, M. Saviz, A. Fallah, " On the electrical properties of collagen macromolecule solutions: Role of collagen-water interactions ", **Journal of Molecular Liquids**, Vol. 300, pp. 1-8, **2020**.
8. M.H. Moradi, **M. Ashoorirad**, R. Baghbani, “ECG Signals Enhancement using Adaptive Kalman filter and Signal Averaging”, International Journal of Cardiology, Vol.173, Issue 3, pp. 553-555, **2014**.
9. R. Baghbani, **M. Ashoorirad**, A. Pourziad, " Microwave sensor for non-invasive glucose measurements design and implementation of a novel linear ", , Vol. 5, Issue 2, pp. 51-57, **2014**.

**Conference Papers:**

1. M. Ashoorirad, R. Baghbani, M.B. Shadmehr, " Intraoperative Localization of Metal Fragment Remained in the Human Body Using Electrical Bioimpedance: a Feasibility Study", **IEEE Sensors Journal, DOI:**[10.1109/JSEN.2024.3364070](https://doi.org/10.1109/JSEN.2024.3364070), **2024**.
2. M. Akbari, Z. Akhavan, **M. Ashoorirad**, R. Baghbani, "Designing and manufacturing a device based on the Internet of Things (IoT) for monitoring vital signs”, Iranian Conference on Biomedical Engineering (ICBME), **2022**.
3. **M. Ashoorirad**, R. Baghbani,"A Small Transversely Magnetized Linear Generator to Harvest Energy for Portable Medical Devices", International Conference on Nonlinear Systems and Optimization in Electrical and Computer Engineering, Dubai, **2015**.
4. **M. Ashoorirad**, R. Baghbani, "Fetal Heart Rate Detection from Maternal Abdominal ECG Signals based on Adaptive Filters", International Conference on Nonlinear Systems and Optimization in Electrical and Computer Engineering, Dubai, **2015**.
5. **M. Ashoorirad**, R. Baghbani, "Using Human Walking Energy for Powering Portable Electronic Devices", 1st Langaroud's Conference On Electrical Engineering (LCEE2015), Islamic Azad University, Langaroud, **2015**.
6. Masoomeh Ashoorirad, R. Baghbani, "Electrical Model of Cerebrospinal Dynamics and Hydrocephaly Shunts", International Conference on Nonlinear Systems and Optimization of Electrical and Computer Engineering, Dubai, **2015**.
7. R. Baghbani, **M. Ashoorirad**, " Brain Toumor Boundary Detection in MRI Image using Active Contours and Morphology Filters", ICDIP, IEEE, International Conference on Digital Image processing, Singapore, February **2010**.
8. **M. Ashoorirad**, R. Baghbani, " Blood Vessel Segmentation in Angiograms using Fuzzy Inference System and Mathematical Morphology", ICSIP, IEEE, International Conference on Signal and Image Processing, Singapore, May **2009**.
9. R. Baghbani, **M. Ashoorirad**, " Segmentation of Coronary Artery Image Based on Mathematical Morphology", Waset, International Conference on Signal and Image Processing, Amsterdam, The Netherland, September **2009**.
10. R. Baghbani, **M. Ashoorirad**, " A Power Generating System for Mobile Electronic Devices Using Human Walking Motion", ICCEE, IEEE, International Conference on Computer and Electrical Engineering, Dubai, 28-30 **2009**.
11. R. Baghbani, **M. Ashoorirad**," A New Method for Measurement Power of Lens using Image Processing Techniques", I2MTC, IEEE, International Instrumentation and Measurement Technology Conference, Singapore, May **2009**.
12. **M. Ashoorirad**, R. Barzamini, " Model Reference Adaptive Path Following for Wheeled Mobile Robotes", ICIA2006, IEEE, International Conference on Information and Automation, Sri Lanka, December **2006**.
13. **M. Ashoorirad**, S.A. Seyedsalehi, " Robust Speech Recognition System against Microphone Variety using Neural Networks", 11th Electrical Iranian Conference, Shiraz, Iran, May **2003**.

Course Taught

* Implantable Neural Microsystems (MSc)
* Research Method and Seminar (MSc)
* Special Issues (MSc)
* BioMEMS (BSc)
* Medical Instrumentations (BSc)
* Introduction to Biomedical Engineering (BSc)
* C++/Python Programming Language (BSc)
* Logic Circuits and Lab (BSc)
* Signals and Systems (BSc)
* Electrical Circuits I, II and Lab (BSc)
* Engineering Mathematics (BSc)
* Technical English Language for Biomedical students (BSc)

**Teaching Assistantships:**

* **2001-2002 (Fall-Spring):** Electrical Circuits, Signals and Systems, Biomedical Engineering Faculty, **Amirkabir University of Technology**, Tehran, Iran.
* **2015-2016 (Fall):** Integrated Circuits Design, Biomedical Engineering Faculty, **Amirkabir University of Technology**, Tehran, Iran.

**Academic Experience**

* **2010 -present:** Member of Biomedical Engineering Department, Hamedan University of Technology, Hamedan, Iran.
* **2022 - present:** Member of research and industry relations committee, Hamedan University of Technology, Hamedan, Iran.
* **2022 - present:** Head of Medical Engineering Research Laboratory, Hamedan University of Technology, Hamedan, Iran.
* **2021- present:** Supervisor of Student Biomedical Engineering Association, Hamedan University of Technology, Hamedan, Iran.
* **2006 -2010:** Head of Biomedical Engineering Department, Islamic Azad University, Dezful Branch, Dezful, Iran.
* **2004 - 2006:** Head of Electrical and Biomedical Engineering Department, Islamic Azad University, Dezful Branch, Dezful, Iran.
* **2006 -2010:** Member of Biomedical Engineering Department, Islamic Azad University, Dezful Branch, Dezful, Iran.
* **2005-2010:** Supervisor of Student Biomedical Engineering Association, Islamic Azad University, Dezful Branch, Dezful, Iran.
* 2004-2010: Member of Central Technical Council of Biomedical Engineering, Islamic Azad University, Tehran, Iran.
* 2003 -2006: Member of Electrical Engineering Department, Islamic Azad University, Dezful Branch, Dezful, Iran.

**Honors and Awards**

**Work Honors:**

* **Distinguished Teacher** in Electrical and Biomedical Engineering Faculty, Hamedan University of Technology, **2023**.
* **Distinguished Teacher** in Electrical and Biomedical Engineering Faculty, Hamedan University of Technology, **2015**.
* **Distinguished Researcher** in Electrical and Biomedical Engineering Faculty, Hamedan University of Technology, **2014**.
* **Distinguished Researcher** in Electrical and Biomedical Engineering Faculty, Islamic Azad University, Dezful Branch, **2009**.
* **Distinguished Teacher** in Electrical and Biomedical Engineering Faculty, Islamic Azad University, Dezful Branch, **2008**.
* **Distinguished Teacher** in Electrical and Biomedical Engineering Faculty, Islamic Azad University, Dezful Branch, **2005**.

**Education Honors:**

* **Ranked 22th** in nation-wide PhD entrance exam of Biomedical Engineering and **Ranked 1th** among 9 accepted PhD candidate at Amirkabir University of Technology, **2015**.
* Ph.D. scholarship, Nanyang Technological University (NTU), Singapore, **2010**.
* Totally **Ranked 31th**in nation-wide Electrical and Biomedical Engineering M.Sc. entrance exam **among 10258** participants, **2000**.
* **Ranked 3th** among 30 students of Biomedical Engineering discipline during the 4 years of B.Sc. Program, **2000**.
* Totally **Ranked 5th** in national university entrance exam (Concours) **among 14670** participants, **1996**.