Matin Barekatain

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Education

- **Ph.D. in Electrical & Computer Engineering** — August 2017 - Present
  University of Southern California — *Los Angeles, CA*
- **M.Sc. in Computer Science and Electrical & Computer Engineering** — August 2017 - Present
  University of Southern California (Double Major) — *Los Angeles, CA*
- **B.Sc. in Electrical Engineering** — August 2013 - July 2017
  Sharif University of Technology — *Tehran, Iran*

Work Experience

- **University of Southern California MEMS Group** — USC, Los Angeles, CA
  Graduate Researcher — *August 2017 - Present (4.7 years)*

  Sensors R&D

  Topics: Energy Harvesters, MEMS, Zero-power Sensing, RF Filters/Resonators/Antennas, IoT for Wearables, RFID, Acoustic Tweezers/Propellers.

  Data Engineering

  Topics: Embedded DSP, Machine Learning for Sensors, Audio DSP, Low-Power & Noise-Robust Classification, AI for Healthcare, Deep Learning.

- **Kavoshcom Asia R&D Group** — Tehran, Iran
  Research Intern — *March 2016 - August 2017 (1.5 years)*

  Wearables & IoT R&D

  Topics: Always-On Wearables, Low-Power Sensors, Embedded DSP.

- **Advanced Communications Research Institute (ACRI)** — Tehran, Iran
  Undergraduate Researcher — *May 2015 - September 2015 (4 months)*

  Signal Processing

  Topics: Optimization for Sparse Data, Sub-Nyquist Sampling.

Areas of Interest

Smart Sensors Design
Embedded DSP
Machine Learning for Sensors
AI in Healthcare
Low-Power Sensing
Audio DSP
IoT
RFID

Honors & Awards

- **Ph.D. Fellowship Awards** — 2017
  Won Ph.D. Fellowship awards of the University of Pennsylvania and Rice University.
- **Graduate & Undergraduate Teaching Fellow** — 2014-Present
  Mentored more than 600 students in 12 different courses, student average rating: 4.75/5.00.
- **Admission to Graduate Program without Entrance Exam** — 2017
  < 1% acceptance rate, Sharif University of Technology.
- **Member and Fellowship Award Winner of the National Elite Foundation** — 2013-2017
  As an exceptional talented student based on Academic Success.
- **Ranked 3^{rd} in Terms of Cumulative GPA** — 2016
  Among 45 B.Sc. Electrical Engineering- Electronics students at Sharif University of Technology.
- **Ranked 91^{st} in National Universities Entrance Exam** — 2013
  Out of more than 300,000 undergraduate applicants in the B.Sc. Entrance Exam.

Skills

- **Languages**: Python, Matlab, C, LaTeX.
- **Frameworks**: TensorFlow, PyTorch, Librosa, Scikit, Pandas.
- **Development**: Microelectronics Chip Fabrication, System-on-Chip, PCB, MEMS.
- **Platforms**: Cypress/Infineon BLE, TI BLE, Arduino, GCP.
- **Tools**: Git, COMSOL, HFSS, AutoCAD, Adobe Photoshop & Illustrator.

Publications

• M. Barekatain, E. S. Kim, "Wireless and Battery-less Tamper Detection with Pyroelectric Energy Converter and High-overtone Bulk Acoustic Resonator", submitted to the IEEE Sensors Journal.

• A. Shkel, M. Barekatain, E. S. Kim, "FBAR-Based Sensor for Wireless RFID Authentication of Integrated Circuits", Technical Digest-Solid-State Sensor, Actuator, and Microsystems Workshop, June 2018.

• E. Hadizadeh, R. Rabbani, Z. Azizi, M. Barekatain, E. Khoram, A. Fotowat-Ahmady, "Ultra Low-Power System for Remote ECG Monitoring," 28th National Conference and 6th International Iranian Conference of Biomedical Engineering, 2021, Sharif University of Technology, Tehran, Iran, Nov. 2021, Oral presentation (Arxiv: 1903.08835).

• K. Sadeghian Esfahani, Y. Tang, J. Lee, M. Barekatain, and E.S. Kim, "Underwater Acoustic Tweezers Capable of Trapping Large and Heavy Particles," Solid-State Sensor and Actuator Workshop, Hilton Head Island, SC, June 5 - 9, 2022, Accepted as an Oral Presentation.

• H. Liu, A. Roy, Y. Tang, M. Barekatain, and E.S. Kim, "Ultrasonic Air-Borne Propulsion Through Synthetic Jets," Solid-State Sensor and Actuator Workshop, Hilton Head Island, SC, June 5 - 9, 2022, Accepted as a Poster Presentation.

Selected Graduate Course Work

Applications of Machine Learning for Medical Data
Microelectromechanical Systems
Analysis of Algorithms
Machine Learning
Advanced Computer Vision
Applied Natural Language Processing
Mixed-Signal Integrated Circuit Design
Foundations of Artificial Intelligence
Database Systems
Linear Algebra for Engineering