

SARA SHOOURI

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Education

University of Michigan

Ph.D. in Electrical and Computer Engineering

Computer Vision and Machine Learning. GPA:4/4

Spring 2026 (anticipated)

Ann Arbor, USA

University of Michigan

M.Sc. in Electrical and Computer Engineering

Signal and Image Processing and Machine Learning. GPA:4/4

Spring 2021

Ann Arbor, USA

Sharif University of Technology

B.Sc. in Electrical Engineering

Communication Systems. GPA: 17/20 (3.70/4)

Spring 2019

Tehran, Iran

Technical Skills

Languages: Python, MATLAB, Julia, C.

Machine Learning Libraries: Pytorch, Tensorflow, Scikit-Learn, Pandas.

Relevant courses: (1) Probability and Random Processes, (2) Matrix Methods for Signal Processing and Machine Learning, (3) Optimization Methods in Signal Processing and Machine Learning, (4) Computer Vision, (5) Advanced Computer Vision, (6) Hybrid Control.

Research Interest

Efficient Multi-Modality and Deep Learning Networks, Low-Cost Adaptive Inferences, Multi-Task Learning, Efficient Vision Mamba

Industrial Experience

Meta

Summer 2024

ML/CV Research Ph.D. Intern

NYC, NY

- Collected multiple rounds of datasets, capturing hours of CSI data by walking around the office using the Quest headset; trajectories were computed using SLAM based on IMU and image data.
- Processed the data to generate Time-of-Flight (TOF) and Angle of Arrival (AOA) measurements and trained a Siamese network on the resulting TOF-AOA heatmaps for deep learning-based fingerprint matching.
- Enhanced CSI data localization accuracy, achieving a **5 cm** reduction in localization error compared to traditional RSSI-based methods, recognized for potential use in **production**.

Advanced Micro Devices (AMD)

Winter 2024

AI/ML Data Center Research Ph.D. Tech Intern

Austin, TX

- Designed and optimized a robust benchmarking pipeline for Retrieval-Augmented Generation (RAG) and LLaMA (7B, 13B, 70B), employing post-quantization to 8-bit weights and activations for efficiency.

Commonwealth Scientific and Industrial Research Organization (CSIRO)

Fall 2018

Research Intern

Brisbane, Australia

- Implemented an advanced processing pipeline for resource-constrained embedded systems to estimate heart rate and detect feeding events in fish using implantable biologgers.

Academic Experience

University of Michigan

2020 – present

Graduate Student Research Assistant | Advisor: Prof. Hun-Seok Kim

Ann Arbor, MI

Harnessing Temporal Cues for Efficient 3D Object Detection via Multi-Modal Fusion

- Developed a predictive history aware adaptive scanning framework that integrates LiDAR and RGB cameras with a lightweight predictor network and a differentiable Gumbel Softmax mask generator network to concentrate dense scans on predicted regions of interest, sparsely sample other areas, and achieve over **65%** reduction in LiDAR energy consumption on nuScenes and Lyft benchmarks while maintaining competitive 3D object detection performance.

Efficient Computation Sharing for Multi-Task Visual Scene Understanding

- Introduced a novel framework that efficiently addresses multiple visual tasks by sharing knowledge through computation and parameter sharing among individually trained single-task transformers, outperforming SOTA in accuracy and resource utilization across image and video data. Our model achieves **40.5%** and **65.7%** reduction in FLOPS for the single image and video, respectively.

Siamese Learning-based Monarch Butterfly Localization

- Advocated a GPS-less strategy utilizing deep learning sensor fusion to enhance daily Monarch butterfly tracking accuracy. The model incorporates daylight intensity and temperature data, enabling accurate butterfly localization through the utilization of Siamese networks. This model can achieve a mean absolute error of 1.416° in latitude and 0.393° in longitude coordinates outperforming the SOTA.

University of Michigan

2019 – 2020

Graduate Student Research Assistant | *Advisor: Prof. Necmiye Ozay*

Ann Arbor, MI

Falsification of a Vision-based Automatic Landing System

- Performed an analysis of automatic landing system reliability for fixed-wing aircraft, utilizing camera-centric sensing. Devised an innovative vision-oriented landing framework, integrating PID control and runway location estimation.

Sharif University of Technology

2017 – 2018

Student Research Assistant

Tehran, Iran

- Developed a novel model for the accurate detection of Apnea disease utilizing ECG signals.

Preprints

Sara Shoouri, et al. “Adaptive LiDAR Scanning: Harnessing Temporal Cues for Efficient 3D Object Detection via Multi-Modal Fusion.”, Under Submission, 2025.

Delbert A. Green, **Sara Shoouri**, et al. “Social hermeregulation enables long-distance, bidirectional monarch butterfly migration.” Under Submission, 2025.

Selected Publications

Fan, Zichen, Qirui Zhang, Pierre Abillama, **Sara Shoouri**, et al. “A 22nm 25.08 TOPS/W Multi-Task Transformer Accelerator with Mixed Precision Structured Sparsity and Two-Stage Task-Adaptive Power Management.” 2025 Symposium on VLSI Technology and Circuits (**VLSI Technology and Circuits**).

Sara Shoouri, et al. “Efficient Computation Sharing for Multi-Task Visual Scene Understanding.” In Proceedings of the IEEE/CVF International Conference on Computer Vision (**ICCV**). 2023. | [\[Code\]](#)

Fan, Zichen, Qirui Zhang, Pierre Abillama, **Sara Shoouri**, et al. “TaskFusion: An Efficient Transfer Learning Architecture with Dual Delta Sparsity for Multi-Task Natural Language Processing.” In Proceedings of the 50th Annual International Symposium on Computer Architecture (**ISCA**), 2023.

Morteza Tavakoli Taba, S. M. Hossein Naghavi, **Sara Shoouri**, et al. “A 53-62 GHz Two-channel Differential 6-bit Active Phase Shifter in 55-nm SiGe Technology.” In Proceedings of IEEE 49th European Solid State Circuits Conference (**ESSCIRC**), 2023.

Sara Shoouri, et al. “Siamese Learning-based Monarch Butterfly Localization.” In IEEE Data Science and Learning (**DSLW**), 2022. | [\[Code\]](#)

Inhee Lee, Roger Hsiao, Gordy Carichner, Mingyu Yang, **Sara Shoouri**, et al. “mSAIL: milligram-scale multi-modal sensor platform for monarch butterfly migration tracking.” In Proceedings of the 27th Annual International Conference on Mobile Computing and Networking (**Mobicom**), 2021. (**Best Paper Award**) | [\[Code\]](#)

Shen, Yiran, Reza Arablouei, Frank De Hoog, Xing Hao, James Sharp, **Sara Shoouri**, et al. “In-situ Fish Heart Rate Estimation and Feeding Event Detection Using an Implantable Biologger.” IEEE Transactions on Mobile Computing, 2021.

Shoouri, Sara, et al. “Falsification of a Vision-based Automatic Landing System.” In AIAA Scitech 2021 Forum, 2021.

Shen, Yiran, Reza Arablouei, Frank de Hoog, James Sharp, **Sara Shoouri**, et al. “Estimating heart rate and detecting feeding events of fish using an implantable biologger.” In 19th ACM/IEEE International Conference on Information Processing in Sensor Networks (**IPSN**), 2020.

Scholarships & Awards

- The College of Engineering Doctoral Intern Funding, University of Michigan. | *Feb 2024*
- Rackham Conference Travel Grant. | *Oct 2023*.
- Audience choice awards for the paper presentation at DSLW 2022. | *May 2022*.
- Best paper award at Mobicom, 2021. | *Fall 2021*.
- PhD Fellowship offers from UMICH, Purdue University, WISC. | *Fall 2021*.
- Ranked 85th (top 0.038 percent) among 222'507 participants in the Iranian Nationwide University Entrance Exam Known as Konkoor. | *Fall 2014*.