SOFIA KARDOIK

kardonik@umich.edu | Ann Arbor, MI

EDUCATION

University of Michigan   **Ann Arbor, MI**
Ph.D. Candidate in Electrical and Computer Engineering   *Expected Graduation: August 2028*
Signal and Image Processing and Machine Learning   *GPA: 3.89/4.00*

University of Michigan   **Ann Arbor, MI**
Master of Science in Electrical and Computer Engineering   *May 2025*
                                                                                                          GPA: 3.89/4.00

University of Texas   **Austin, TX**
Bachelor of Science in Electrical and Computer Engineering   *May 2023*
                                                                                                          GPA: 3.75/4.00

INSTRUCTIONAL EXPERIENCE

Graduate Student Instructor, Matrix Methods for Signal Processing and ML   **August 2025 – December 2025**
Department of Electrical and Computer Engineering, University of Michigan

- Led weekly discussion sections focused on reinforcement of lecture concepts and coding assignments in Julia
- Held office hours to help students with assignments and clarify course material

RESEARCH EXPERIENCE

Research Interests: Inverse problems; Signal and image processing; MRI reconstruction; Machine learning

fMRI Research Lab and Fessler Research Group   **January 2024 – Present**

- Conducted an extensive literature review on denoising techniques in functional MR imaging using techniques in probability theory, under the supervision of Dr. Douglas Noll and Dr. Jeff Fessler
- Implemented an fMRI image denoising pipeline in Julia to experiment with the tuning of various parameters
- Explored model-based image reconstruction methods for functional MRI

Computational Sensing and Imaging Research Lab   **September 2021 – May 2023**

- Undergraduate researcher working under Dr. Jon Tamir
- Generated motion corrupt brain images using linear rotation and translation methods in k-space for data driven retrospective motion correction
- Explored effects of mixed precision training on MRI reconstruction problems

CONFERENCE PROCEEDINGS AND ABSTRACTS

S. Kardonik, J. Fessler, D. Noll, "Activation Spread due to Local Low-Rank Denoising in SMS-EPI Task-Based fMRI Data", *International Society for Magnetic Resonance in Medicine Annual Meeting, South Africa,* 2026. (Abstract)

B. Levac, S. Kumar, **S. Kardonik**, J. Tamir, "FSE Compensated Motion Correction for MRI Using Data Driven Methods", *25th International Medical Image Computing and Computer Assisted Intervention*, 2022, https://doi.org/10.48550/arXiv.2207.00656

WORK EXPERIENCE

Aurora Flight Sciences, A Boeing Company; Software Engineering Intern   **May 2022 – August 2022**

- Built a flight simulator and interface for data collection of a commercial flight to research pilot's fatigue
- Wrote a UI in Python to visualize a pilot's gaze around the flight simulator
- Conducted a literature review of ML models that use heart rate variability, blinking rate, and workload to detect fatigue during a prolonged flight

Uhnder, Inc.; Software Intern   **June 2020 – August 2020**
- Calibrated and tested different versions of radars that are sent to clients for industry use
- Revised python code for the company's expanding software updates
- Trained new technicians in calibration procedures and wrote a guide for future employees to follow

PROJECTS

Time Series Forecasting with Prior-Data Fitted Networks
- Delivered a final paper discussing shortcomings and novel contributions to ForecastPFN – a machine learning framework that is trained using synthetic data sampled from a prior distribution and predicts data values in the future
- Collaborated with a team of three classmates to complete the project, dividing roles into model training and tuning, synthetic data generation, and analyzing test data

Senior Design Capstone
- Designed a network of non-invasive wearable sensors to detect and monitor dehydration and heat stroke
- Used ECG, galvanic skin response, and body temperature sensors

EXTRACURRICULARS

ECE Graduate Student Council
- Serving as president of the BuddEEs committee – a mentorship program designed to enhance the academic and social integration of incoming PhD students in electrical and computer engineering
- Organized social events to foster peer networking among new and current PhD students, promoting a supportive and inclusive environment

Women in Electrical and Computer Engineering (WECE)
- Attended networking gatherings with ECE faculty to learn about their experience in academia
- Sought connections with other distinguished graduate women in the field

SKILLS

Programming Languages: Python, Julia, MATLAB, C/C++, ARM Assembly
Tools: Linux, Git, Jupyter Notebook
Languages: fluent in Russian, some understanding of Hebrew

Relevant Coursework: Machine Learning; Optimization in Signal Processing and ML; Matrix Methods for Signal Processing; Probability and Random Processes; Medical Imaging Systems; Detection, Estimation, and Filtering; Real-Time Digital Signal Processing; Algorithms; Operating Systems; Digital Image Processing; Embedded Systems; Discrete Math