

Mariia Sidulova, PhD

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Summary

Machine Learning Engineer with experience creating generative model solutions for anomaly detection in medical imaging data and developing deep-learning tools for bias and fairness assessments. Seeking a full-time Machine Learning Engineer role. My expertise lie in the areas of unsupervised learning, generative AI, bias, fairness, generalizability, and safety assessments.

Education

George Washington University, Washington DC

August, 2019 – December, 2023

PhD in Biomedical Engineering

GPA: 3.9/4

University of Minnesota, Minneapolis

August, 2015 – May, 2019

Bachelors of Biomedical Engineering - Neural Engineering

GPA: 3.2/4

Technical Skills

Software and Languages: Python, MATLAB, Mathematica, SolidWorks, LaTeX, Altium Designer, Slurm, Git, Poetry,
Python Libraries: PyTorch, OpenCV, Tensorflow, Keras, Scikit-learn, Pandas, Numpy, Scipy, Matplotlib, Seaborn, Transformers, LangChain

Work Experience

Food and Drug Administration

June 2022 – Present

Machine Learning Engineer (ORISE Fellow)

Washington, DC

- Developed open-source deep unsupervised learning [python library](#) for clustering large-scale medical imaging dataset
- Pioneered implementation of graph neural network (GNN) and variational inference clustering approaches to identify hidden subgroups in digital pathology datasets
- Performed regulatory science research to assess bias, safety and robustness of ML models, which resulted in multiple scientific publications at top-tier ML conferences (MICCAI, CHIL)
- Improved precision and sensitivity of LLM-generated summaries of medical records using a novel LLM-judge pipeline
- Received “*Outstanding Young Researcher*” award

George Washington University

August 2019 – December 2023

Machine Learning Researcher

Washington, DC

- Developed deep generative AI algorithms (VAE, Diffusion models) to detect abnormal brain connectivity from fMRI (sequential 3D volumetric data), which reduced sex-related bias compared to existing solutions
- Contributed to the development of a robust multimodal emotion recognition system from the video frames using Generative Pre-trained Transformer (GPT), WaveRNN, and FaceNet+RNN
- Evaluated the performance of the explainable AI algorithm LIME on multi-class classification models of EEG brain signals, showing high accuracy in detect early signs of Alzheimer’s disease

George Washington University

August 2019 – May 2022

Teaching Assistant

Washington DC

- Supervised 8-10 team projects per semester, guiding teams through the complete lifecycle of medical device development, resulting in 3 teams creating biotech startups.
- Lectured on principles of prototyping, SCRUM project management, product development, and customer discovery
- Received “*Outstanding Teaching*” award

InSitu Technologies Inc

February 2019 – May 2019

Biomedical Engineering Intern

St. Paul, MN

- Performed experiments to aid the design and development of new products for the treatment of aneurysms
- Automated process of statistical analysis of test data, which reduced data processing time by 10 hours/week

Selected Publications

- M. Sidulova, X. Sun, and A. Gossmann, “Deep unsupervised clustering for conditional identification of subgroups within a digital pathology image set,” *MICCAI*, 2023
- B. Xie, M. Sidulova, and C. H. Park, “Robust multimodal emotion recognition from conversation with transformer-based crossmodality fusion,” *Sensors*, vol. 21, no. 14, p. 4913, 2021
- M. Sidulova, R. Kim, and C. H. Park, “Cerebrovascular event detection robotic system: Rob bitt,” in *2020 8th IEEE BioRob*, pp. 673–678, 2020 (*Best Student Paper Award Nominee*)
- M. Sidulova, N. Nehme, and C. H. Park, “Towards explainable image analysis for alzheimer’s disease and mild cognitive impairment diagnosis,” in *2021 IEEE (AIPR)*, pp. 1–6, IEEE, 2021