Mariia Sidulova, PhD

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Summary

Machine Learning Engineer with experience in developing software tools for FDA and creating generative model solutions for anomaly detection in medical imaging data. Ph.D. in Biomedical Engineering. Seeking a full-time Machine Learning Engineer role.

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

Programming Languages and Software: Python, MATLAB, Mathematica, SolidWorks, LaTex, Altium Designer
Python Libraries: PyTorch, OpenCV, Tensorflow, Keras, Scikit-learn, Pandas, Numpy, Scipy, Git

Work Experience

Food and Drug Administration **June 2022 – Present**
Machine Learning Engineer (ORISE Fellow) *Washington, DC*

- Contributed to the development of deep unsupervised learning python library DomId for clustering medical images
- Performed regulatory science research to assess the generalizability of ML models, which resulted in multiple scientific publications at top-tier ML conferences
- Received ***"Outstanding Young Researcher"*** award

George Washington University **August 2019 – Present**
Machine Learning Researcher *Washington, DC*

- Developed deep generative models to detect abnormal brain connectivity, which reduced sex-related bias compared to existing solutions
- Contributed to the development of a state-of-the-art robust multimodal emotion recognition system using Generative Pre-trained Transformer (GPT), WaveRNN, and FaceNet+RNN

George Washington University **August 2019 – May 2022**
Teaching Assistant *Washington DC*

- Supervised 8-10 team projects through the process of engineering medical devices for real-world clients
- 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 Projects

Domain Identification (DomId) | *GitHub*

- Deep unsupervised clustering python package for domain identification which includes algorithms based on variational inference (VaDE, DEC), convolutional graph neural networks (SDCN)
- Implemented conditioning mechanism allowing incorporation of additional variables into clustering aiding in identification unannotated subgroups

fMRI Functional Connectivity

- Compared generative performance of multiple architectures of Variational Autoencoders in application to Functional Connectivity analysis of fMRI data
- Developed Denoising Diffusion Probabilistic Model for anomaly detection in fMRI data

Selected Publications

- M. Sidulova, X. Sun, and A. Gossmann, "Deep unsupervised clustering for conditional identification of subgroups within a digital pathology image set," *International Conference on Medical Image Computing and Computer-Assisted Intervention*, 2023 (accepted, in press)
- 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 RAS/EMBS International Conference for Biomedical Robotics and Biomechatronics (BioRob)*, pp. 673–678, 2020 ***(Best Student Paper Award Nominee)***