SOFIA NEDOROSLEVA

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EDUCATION

M.S., Electrical and Computer Engineering, GPA 3.71/4.0 Expected Mar 2024
Santa Clara University, Santa Clara, CA
Specialization: **Machine Learning and Signal Processing**
Courses: ML, Deep Learning, Natural Language Processing, Reinforcement Learning, Parallel Computing, Autonomous Driving Systems, Digital Image Processing, ML with FPGA, Computer Architecture, Data Structures and Algorithms

B.S., Aerospace Engineering, GPA 3.1/4.0 May 2018
Rensselaer Polytechnic Institute, Troy, NY

SKILLS

Languages	Python, C/C++, Bash, MATLAB, SQL
Data Packages/Libraries	PyTorch, NumPy, NLTK, SciPy, Scikit-Learn, OpenCV, TensorFlow
Technologies/Tools	Linux, Docker, FastAPI, Flask, Jupyter, AWS, Git, OpenMPI, Slurm
Domain Specific	Neural Networks, CNNs, LLMs, Transformers, Generative AI, Computer Vision, Pose Estimation, NN Deployment, High Performance Computing

EXPERIENCE

Software Engineering Intern, Machine Learning (LLMs) Jun 2023 - Sep 2023
Advantest Inc. *San Jose, CA*

- Developed a Retrieval Augmented Generation (RAG) Chatbot, increased engineers' speed of access to critical information by 50%.
- Achieved 75% user engagement rate with 50 active users by launching the RAG-based chatbot into production with Docker and FastAPI.
- Fine-tuned LoRA LLMs on multiple GPUs, resulting in 15% improvement in chatbot response tone and style, as measured by user feedback.
- Showcased live app to directors, VPs, and employees, receiving positive and constructive feedback for beta release.

Graduate Student Researcher Mar 2023 - present
SCU – Human-Machine Interaction & Innovation Research Group (HMI2) *Santa Clara, CA*

- Enhanced functionality of assistive robotic system by implementing object detection and 6D pose estimation, resulting in computer vision capability.
- Improving robotic system grasping accuracy, estimated 30%, by creating a dataset of objects in containers for object recognition model training.
- Researched improvements compared to SOTA methods by reviewing over 50 papers on pose estimation for robotics.

Structural Analysis Engineer – Aircraft Primary Structure (Fuselage) Jun 2018 - Dec 2021
Airbus – Engineering Center ECAR *Moscow, Russia*

- Improved primary structure safety margins by 5% after significant design changes via static strength analysis using Airbus certified methods.
- Automated analytical stress calculations for 5+ non-standard components by developing **Python** scripts for structural modeling.
- Elevated team productivity and quality to 98% by developing **Python** tools to optimize work processes.

Engine/Drivetrain/Electrical Leader (leadership year '16 - '17) Aug 2014 - May 2018
Formula SAE - Rensselaer Motorsport *Troy, NY*

- Led a team of 8 engineering students in designing and building engine/electrical systems, raised FSAE Michigan ranking from 52nd to 23rd.
- Resolved team communication issues by implementing cross-functional leadership model and setting performance-oriented goals.

PROJECTS

CNN Inference on FPGA. Designed an HLS implementation of a CNN forward pass for handwritten digit recognition. Achieved accuracy >0.90. (Github)
Tools: C++, Vitis HLS.

VAE Latent Space Dimension Minimization. Implemented a VAE-Linear NN pipeline for RGB images, minimized Conv VAE latent space size by 50% while preserving high reconstruction and classification accuracy. (Github)
Tools: Python, Pytorch.

Parallel DCT for Image Compression. Parallelized image compression algorithm for high-resolution medical images, achieved x20 speedup compared to serial algorithm. (Github)
Tools: C++, OpenMP, OpenMPI, Linux, Slurm.

Image Segmentation – MRI images. Segmented stomach and intestines on MRI scans by developing a Unet based model with EfficientNet backbone pre-trained on ImageNet. (Github) (Kaggle)
Tools: Python, Pytorch, Linux, Jupyter.

Object Detection-Classification – X-rays. Detected and classified 14 abnormalities in chest radiographs with an object detection-classification YOLOv5 pipeline using transfer learning. Placed top 15%. (Github) (Kaggle)
Tools: Python, Pytorch, Linux, Jupyter.

Motion Prediction for Autonomous Vehicles. Predicted trajectories for agents surrounding the AV for next 5sec with a ResNet based model evaluated with multi-modal negative log-likelihood loss. Placed top 10%. (Github) (Kaggle)
Tools: Python, Pytorch, Linux, Jupyter.