

Maria Plessia

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EDUCATION

Carnegie Mellon University

Master of Science in Mechanical Engineering - Research in Deep Learning applications

Pittsburgh, PA

December 2023

University of Rochester

Bachelor of Science in Mechanical Engineering, Minor in Computer Science

Rochester, NY

May 2022

- Dean's List, Shelby Davis UWC Scholarship, University of Rochester Merit Scholarship

TECHNICAL SKILLS

- Programming: Python, C++, MATLAB, HTML, PHP, CSS, Java, Javascript
- ML: PyTorch, Keras, Tensorflow, OpenCV, PyG, DGL, Hugging Face
- Libraries/Tools: Numpy, matplotlib, seaborn, Pandas, scikit-learn, MySQL
- OS: Linux (Ubuntu, CentOS)
- Version Control: Git
- Cloud Platforms: GCP, AWS, Google Colab

RESEARCH

Carnegie Mellon University - AiPEX Lab

Graduate Research Assistant

Pittsburgh, PA

September 2022 – present

- Benchmarked GNNs for flow parameter estimation in coronary arteries using FEA meshes; utilized Diffusion generative models (EGNN) to compare performance; Utilized CUDA for GPU-accelerated training & GPU parallelism for accelerated convergence
- Researched standardizing methods for GNNs & employed metrics (Log of maximum evidence, 10-fold cross-validation, WL isomorphism) to rank and assess transferability and scalability for graph learning tasks

Technische Universität Dresden - Material Models Group

Undergraduate Research Assistant – DAAD RISE Fellow

Dresden, Germany (remote)

May 2021 – July 2021

- Optimized algorithm for segmentation on CT-data of fiber-reinforced plastics for airplane wings
- Implemented a CNN with 90% accuracy to determine the best reinforcement architecture from the fiber volume content

SELECTED PROJECTS

MyTorch

11-685, Fall 2022

Pittsburgh, PA

September – November 2022

- Implemented own deep learning library from scratch inspired by PyTorch
- Coded linear layers, activations (Sigmoid, Tanh, ReLU), loss functions (MSE Loss, CE Loss), optimization (SGD), and batch normalization, and created a Multi-Layer Perceptron (MLP) with 0, 1, and 4 hidden layers
- Coded convolutional, pooling, upsampling, and downsampling layers to implement a 1D and 2D CNN
- Wrote code to implement RNNs, GRUs, LSTMs, and Connectionist Temporal Classification (CTC)

Attention-Based End-to-End Speech-to-Text Deep Neural Network

11-685, Fall 2022

Pittsburgh, PA

November – December 2022

- Set up an encoder (bidirectional pyramidal LSTM) to effectively extract features from a speech signal
- Implemented a decoder to sequentially produce the audio transcription and attention between the encoder and the decoder

Face Classification and Verification using CNNs

11-685, Fall 2022

Pittsburgh, PA

October 2022

- Created a face classifier that extracts feature vectors from face images
- Coded a verification system that computes the similarity between feature vectors of two images

Fame Level Classification of Speech

11-685, Fall 2022

Pittsburgh, PA

September 2022

- Created a model to generate predictions of phoneme labels of each frame of audio recordings (spectrogram frames); Ran ablation studies to finetune the hyperparameters and achieved a 33% increase in accuracy

TEACHING EXPERIENCE

CSC 160 – Python

January 2020 – May 2022

ME 251 – Heat Power Applications

January – May 2022

ME 260 – MATLAB II

January – May 2021

FELLOWSHIPS AND GRANTS

DAAD RISE Fellowship

March 2021

Grace Hopper Celebration 2020 Scholarship

June 2020

Discover Grant – University of Rochester

May 2020

LEADERSHIP

UR Pittsburgh Alumni Network

Leadership Committee

Pittsburgh, PA

April 2023 - present

Students' Association Government

Appropriations Committee Accountant

Rochester, NY

January 2020 - May 2022