Maria Plessia

https://www.linkedin.com/in/maria-plessia/ | Pittsburgh, PA 15219 | (585) 957-2873 | mplessia@andrew.cmu.edu

EDUCATION

Carnegie Mellon University   **Pittsburgh, PA**
Master of Science in Mechanical Engineering - Research in Deep Learning applications

University of Rochester   **Rochester, NY**
Bachelor of Science in Mechanical Engineering, Minor in Computer Science
- 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   **Pittsburgh, PA**
Graduate Research Assistant   *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   **Dresden, Germany (remote)**
Undergraduate Research Assistant – DAAD RISE Fellow   *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 (**Link**)

Differential Equation Calculator in C++   **Pittsburgh, PA**
CMU 2023   *September – October 2023*
- Wrote code to implement Runga-Kutta (4th order) numerical method to obtain solutions
- Adapted program to solve common engineering problems like simple & complex mass-spring-damp system

MyTorch   **Pittsburgh, PA**
CMU 2022   *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   **Pittsburgh, PA**
CMU 2022   *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   **Pittsburgh, PA**
CMU 2022   *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   **Pittsburgh, PA**
CMU 2022   *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   AWARDS

CSC 160 – Python	DAAD RISE Fellowship
ME 251 – Heat Power Applications	Grace Hopper Celebration Scholarship
ME 260 – MATLAB II	Discover Grant – University of Rochester

LEADERSHIP

UR Pittsburgh Alumni Network   Pittsburgh, PA
Students' Association Government   University of Rochester