Maria Plessia

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EDUCATION

Carnegie Mellon University — **Pittsburgh, PA**
Master of Science in Mechanical Engineering — *December 2023*
- GPA 3.61, Research in Deep Learning applications

University of Rochester — **Rochester, NY**
Bachelor of Science in Mechanical Engineering, Minor in Computer Science — *May 2022*
- GPA 3.72, 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 – Digital Public Goods Alliance — **Pittsburgh, PA**
ML Research Scientist — *August 2022 – December 2023*
- Researched standardizing methods for GNNs & employed metrics (Log of maximum evidence, 10-fold cross-validation) to rank and assess transferability for node classification
- Applied methods such as autoencoders, zero padding, and Principal Component analysis to solve graph dimensionality constrains
- Developed algorithm that allows GNN transferability benchmarking; It provides a transferability ranking based on transfer learning on unseen data to allow informed selection of open-source models with minimal computational cost

Technische Universität Dresden - Material Models Group — **Dresden, Germany (remote)**
Machine Learning Engineer – 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 and fast-track the team's preprocessing

SELECTED PROJECTS (Code Demos)

Beyond Orbit (x) — **Pittsburgh, PA (remote)**
Computer Subsystem — *November 2023 – present*
- Utilized ROS and Gazebo for Talos 2 space rover motion planning; configured MoveIt for Xbox controller integration

Batteries Sorting & Classification - OpenCV — **Pittsburgh, PA**
CMU 2023 — *October – December 2023*
- Used RBG image and depth information taken from Intel RealSense camera and wrote Python algorithm that detects the top-most batteries to be picked first by a robot and then classifies them into their kind so that they are placed in the correct bin

Differential Equation Calculator in C++ — **Pittsburgh, PA**
CMU 2023 — *September – October 2023*
- Coded a 4th order Runge-Kutta numerical method implementation to obtain solutions of first-order ordinary differential equations
- 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

TEACHING EXPERIENCE

CSC 160 – Python
ME 251 – Heat Power Applications
ME 260 – MATLAB II

AWARDS

DAAD RISE Fellowship
Grace Hopper Celebration Scholarship
Discover Grant – University of Rochester