John Mihal

415-238-8891 | johnmihal34@gmail.com | johnmihal.com |

Education

Rochester Institute of Technology Rochester, NY

Bachelors of Science in Computer Science, Minor in Quantum Information Science and Technology *2020 - 2024*

Technical Skills

Languages: Java, Python, MatLab, C, C++, C#, SQL, HTML, CSS, JS, Perl, AWS (Amazon Web Service); Lambda, CloudFormation, S3, API Gateway, State Machine

Concepts: Agile, SCRUM, Databases, ML/AI, Embedded Programming, Optics, Quantum, Computer Vision

Experience

Machine Learning Engineer October 2024 – Present

Penn State Applied Research Laboratory *Washington, DC*

- Developed **ML/AI** foundation models to process **multimodal geospatial data**, including deployment on **orbital edge environments**.
- Implemented **deep learning models** such as **transformers** , **convolutional neural networks (CNN)** and **fusion models** using **Python** and **PyTorch**.
- Utilized **PyTorch Lightning** to allow for efficient **distributed training** across **CUDA GPU nodes**.
- Conducted reviews of scientific literature and presented key actionable insights to enhance team expertise.

Machine Learning Engineer Intern May 2024 – August 2024

Penn State Applied Research Laboratory *Washington, DC*

- Developed **ML/AI** foundation model to process geospatial data.
- Researched and utilized Barlow Twins loss from **Meta** and **NYU** to train a robust **convolutional neural network (CNN)**.
- Implemented a foundation model leveraging **PyTorch**, **NumPy**, **SciKit**, **Pandas**, **Polars** with **GPU accelleration (CUDA)** in a **Dockerized AWS** environment.
- Cleaned and prepared geospatial data using **SQL**, **GeoPandas**, and **MatPlotLib** for storage in **AWS S3**.

Research Assistant September 2023 – May 2024

RIT Quantum Imaging Laboratory *Rochester, NY*

- The Quantum Imaging Laboratory focuses on designing and testing integrated photonics chips.
- Simulated light propagation on a star coupler component using the **Meep Python** library for **FDTD electromagnetic simulation**.

Research & Pre-clinical Development IT Coop January 2023 - August 2023

Regeneron Pharmaceuticals *Tarrytown, NY*

- Worked to create integrations between scientific systems such as BioBank, Clarizen, and other laboratory information management systems (**LIMS**) using **Python** and **AWS Lambda**.
- Designed and implemented an internal **SwaggerHub** replacement using **AWS S3, AWS API Gateway, SwaggerUI** and **JS** which saved over $20,000 in yearly licensing costs.
- Translated business requirements to develop a Dotmatics to CoreLIMS molecule synchronization system and coordinated testing with Senior Developers, Principal Business Analysts and Consultants.
- Deployed continuous integration and continuous deployment (**CICD**) pipelines by configuring **Jenkins CloudBees** and installing Jenkins shell scripts in repositories using **Perl**.

Projects

Autonomous Vehicle Point Cloud Alignment | *C++, PCL, LiDAR* Spring 2024

- Developed a pipeline to integrate point clouds from multiple autonomous vehicles into a cohesive scene by utilizing only the data points within each cloud.
- Researched and implemented algorithms such as ICP and ground registration to achieve near real time performance.

Clash Stats | *JS, Node.js, MongoDB, Express, Pug, Clash Royale API, Bootstrap CSS* Summer 2023

- Created a website where users can make sharable dashboards to view and compare live in game statistics with friends for the mobile game Clash Royale.

Extracurriculars

Multidisciplinary Robotics Club: Designing and building a robot to autonomously navigate a set course. The robot uses LiDAR, a camera and a Nvidia Jetson computer for navigation. *Fall 2023 - May 2024*

Additional Projects

Dice Counter | *Matlab* Winter 2024

- Produced a Matlab project which received pictures of dice on a table and counted the number of dice.

Sticky Site | *JS, Python, Flask, MongoDB, Jinja2* Winter 2024

- A public sticky note board where users can draw a sticky note and post it to the site for all to see.

Servo Drivers | *C, HAL, STM32 Nucleo-L476RG Microcontroller, Oscilloscope, Servo, PWM* Winter 2024

- Designed a system to feed two PWM servos rotation instruction sets and user input instruction commands which can pause the instruction sets and modify the servos directly.

AI Language Model | *Python, TensorFlow* Fall 2023

- Generated 4 language models trained off of scripts from the show "My Little Pony".
- Models used were LTSM, RNN, Two Layer Linear Model, Single Layer Linear Model, these were evaluated using perplexity, and cosine similarity between related words.

AI Number Classifier | *Python, TensorFlow* Fall 2023

- Implemented 8 different models (Single vs Double Layer, Linear vs Convolution, ReLU, maxPool variants and combinations) to classify pictures of handwritten numbers from the MNIST dataset.

Frequency Reader | *C, HAL, STM32 Nucleo-L476RG Microcontroller, Oscilloscope, Wave Generator* Winter 2024

- Wrote code which enabled the microcontroller to receive a wave and count the period of the wave with microsecond accuracy before outputting a histogram of period times.

Weather Web App | *JS, HTML, CSS, API's* Summer 2022

- Learned JS to formulate and develop a JS web app where users can look up the weather of a city.

Meal Hub | *SQL, Relational Databases, Java, Java Fx, Gluon Scene Builder, R, Kaggle, Indexes* Spring 2022

- Designed and implemented a SQL database and Java database management application.
- The application allowed users to manage a virtual pantry, search recipes and receive recommendations.