Mark Gouzoulis

Software Developer

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Education

Bachelor of Science in Computer Science, Minor in Statistics **|** GPA: 3.5   Graduation: May 2025
University of Maryland, College Park
Honors: Gemstone Research Program (Honors College)

Career Experience

ArborMetrix - Software Development Intern   November 2023 - July 2024
- Engineered efficient database queries using SQL, enhancing data accessibility & analysis capabilities
- Implemented error logging and analysis procedures, improving overall system reliability
- Optimized Python configurations, enhancing software performance

Walsworth Research Group - Research Assistant   June 2023 – December 2023
- Collaborated with team of graduate students to translate a MATLAB test suite consisting of over 1000 lines to Python, improving code accessibility
- Engineered interface code to streamline interactions between data acquisition systems and signal generators, enhancing research efficiency

Key Projects

Quantum State Prediction Model (Gemstone Research Program)
- Developed long short-term memory models for quantum state prediction, processing a million data points
- Utilized TensorFlow and Keras to build and train a neural network with a Mean Squared Error loss less than 0.01% for future predictions
- Presented research findings on quantum computing and machine learning to a panel of professors, demonstrating strong communication skills
- Collaborated with a team of physicists and computer scientists to interpret results and refine the model

U-Net Architecture for Image Segmentation
- Designed and implemented a U-Net architecture for advanced image segmentation tasks
- Optimized model performance through iterative experimentation with various layers & hyperparameters
- Implemented data preprocessing and augmentation techniques to enhance model training
- Conducted comparative analysis with other segmentation algorithms using over 1000 images

Principal Component Analysis Model
- Developed a classification model utilizing backpropagation techniques to minimize cross-entropy loss
- Engineered a dimensionality reduction algorithm that preserved critical data trends while reducing computational complexity
- Implemented the algorithm to enable efficient processing of large-scale datasets
- Documented the implementation and usage guidelines for future reference

Multithreaded Orders Processor
- Implemented Java multithreading to efficiently process high volumes of asynchronous orders
- Designed and integrated robust file I/O operations for generating human-readable order formats
- Utilized Java's concurrent utilities to manage thread pools and ensure thread-safe operations

Relevant Coursework: Object-Oriented Programming II | Applied Probability and Statistics | Discrete Structures | Linear Algebra | Computer Systems | Organization of Programming Languages | Algorithms | Data Science | Design and Analysis of Computer Algorithms | Machine Learning | Deep Learning

Technical Proficiencies: Languages: Python, MATLAB, Java, C++, OCaml, Ruby, Rust, HTML, CSS, JavaScript, SQL
Frameworks & Libraries: Pytorch,TensorFlow, Pandas, Numpy, Scikit-learn