

# Alexander Nguy

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## EDUCATION

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### University of Massachusetts Amherst, Amherst, MA

M.S Computer Science GPA: 3.570

February 2025

B.S Computer Science / Mathematics GPA: 3.589 Awards - Dean's List Honors

May 2023

## SKILLS & COURSEWORK

**Skills** – Python (Advanced), Java (Proficient), JavaScript (Proficient), C (Intermediate), PyTorch, Flask, React.js, PostgreSQL, GitHub, Machine Learning, Regression Modeling using NumPy/SciPy, Matplotlib, Unity, Kali Linux

**Coursework** – Machine Learning, Algorithms, Artificial Intelligence, Data Structures, Game Theory, Computer Vision, Probabilistic Graphical Models, Search Engines, Game Programming, Systems Defense and Test, Adv Digital Forensics Systems Formal Language Theory, Logic in Computer Science

## PROJECT EXPERIENCE

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### Variational Auto-Encoder for Deciphering MNIST Images of 0 and 1)

Spring 2024

- Implemented a Variational Auto-Encoder (VAE) using Python JAX NumPy to decipher MNIST images of the digits 0 and 1
- Trained the model by maximizing the Evidence Lower Bound value, which minimizes KL Divergence, thereby maximizing log likelihood of the datapoints
- Visualized clusters of datapoints (0 and 1) by plotting the data as compressed 2D vectors using Matplotlib
- Utilized the learned model to generate new images of 0 and 1 to demonstrate model accuracy

### Periodic Regression Model for Time Series Dataset

Fall 2023

- Implemented a period regression model for a large time-series dataset with sine-based regression
- Analyzed the model by calculating risk and the gradient of the risk to help determine model accuracy using NumPy vectorized functions for efficient processing
- Optimized the regression model parameters using the 'minimize' function from SciPy to minimize the risk with the "L-BFGS-B" optimization method
- Utilized Matplotlib to visualize model performance on training and test data respectively

### Frontend Web GUI for Weather Node Data

Fall 2022

- Designed an interactive frontend GUI using React.js and CSS to display and compare node data pulled from .csv files in the form of graphs, charts, and tables
- Utilized libraries such as React Router to switch between pages efficiently, and ApexCharts.js to display node data using interactive and detailed charts such as a histogram with LMP data
- Implemented the modularity design principle to build the frontend in an optimized and organized format
- Debugged by implementing each component of the application one by one, and testing functionality before extending the application
- Maintained version control of code commits using GitHub branching and shared repositories

## PROFESSIONAL EXPERIENCE

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### SciQuel

Allston, MA

#### Web Developer Intern

June 2022 – August 2022

- Designed and developed web pages for the SciQuel website via Figma design platform
- Utilized Figma's transition tools to create an error screen animation
- Collaborated with peers to maintain website and mobile functionality and integrity

### Kwong Kow Chinese School

Boston, MA

#### Teaching Assistant

Summer 2016-2020

- Mentored and tutored elementary students in subject areas such as English and Mathematics
- Led students and peers in the development of short films that encouraged student creativity and involvement, while teaching various video creation/editing skills