Tyler Meester

EDUCATION

Bachelor of Science, Computer Science, 2023
Western Governor's University
Machine Learning/Data Science Bootcamp, 2021
Springboard
Bachelor of Science, Park Management, 2015
Arizona State University

EXPERIENCE AND PROJECTS

Building a Neural Network with a Scalar Autograd Engine, *Python, Matplotlib, Numpy, Graphviz,*
Developed a multi-layer perceptron neural network from scratch, including a custom built scalar autograd engine for backpropagation. This project involved creating essential classes for neural computations and automatic differentiation, most importantly, a Value class that keeps track of operations, gradients, and connections within the network. Scalar values were incorporated to simplify the computational graph visualizations. This project improved my skills in neural network architecture, mathematical modeling, and Python development.

Digit Classification with Neural Networks, *Python, Matplotlib, Numpy, TensorFlow, SciKitLearn*
Developed image classification models for handwritten digits using the MNIST dataset, including a Convolutional Neural Network, Multi-Layer Perceptron, and Support Vector Machine. Performed data preprocessing, normalization, and reshaping for 2D convolutional layer compatibility. Conducted exploratory data analysis, visualizing image samples and label distributions. Trained models with TensorFlow and SciKitLearn, evaluated performance based on accuracy metrics, and implemented interactive widgets for classification testing. This project improved my skills in machine learning, data visualization, and Python programming.

Client-Side Web Application, *JavaScript, CSS, HTML*
Developed a dynamic front-end for a basic fitness tracking web application, utilizing JavaScript, HTML, and CSS. This involved using JavaScript for structured, object-oriented programming, and CSS for styling. The application features client-side functionalities, such as geolocation API integration and local storage for persistent data across sessions. A key highlight was the implementation of dynamic form handling, which adjusts input fields based on the workout type selected. This project provided valuable experience with JavaScript, client-side rendering, and interactive web application design.

RESTful API and Server-Side Web Application, *Node.js, Express, NoSQL/MongoDB*
In this backend development project I developed a scalable RESTful API using Node.js and Express, integrated with MongoDB. The API supports CRUD operations and includes features like data filtering, sorting, and pagination. Implemented JWT authentication, role-based access control, as well as password hashing and salting for security. Utilized MongoDB's aggregation pipeline and Mongoose for complex queries and efficient data modeling. The application uses MongoDB on Atlas for efficient data storage. This project enhanced my skills in Node.js backend development, RESTful API architecture, and NoSQL database design and management.

Relational Database Design and Business Analysis, *SQL*/Postgre*SQL*
Designed and developed relational databases in SQL, advancing them from first to third normal form to minimize data redundancy and enhance integrity. I translated existing entity-relationship diagrams into functional databases, populated them with sample data, and optimized query performance using SQL views and indexes. I also automated ETL workflows using PostgreSQL, incorporating SQL triggers and stored procedures to maintain real-time data and enable efficient data refresh procedures. This project advanced my skills in database design and management, data normalization, query optimization, and ETL process automation.

Appointment Scheduling Java Application, *Java, SceneBuilder, MySQL/SQL*
Developed a Java-based scheduling and customer management application for a global consulting firm. Designed a UML diagram based on open ended project constraints. Created a MySQL database using MySQL Workbench and integrated JDBC in the program to access the database and perform SQL queries. Developed the program GUI using JavaFX and SceneBuilder and the MVC paradigm. Implemented program logic by incorporating object-oriented programming concepts such as normal and abstract classes, public and static members/methods, inheritance, dependency and more.

ESP-32-Based IoT Cloud Integration Project, *C++, ESP-IDF, AWS IoT Core*
Developed an IoT sensor application using ESP-IDF and the ESP32 microcontroller, designed to interface with AWS IoT Core via MQTT protocol for cloud-based data exchange. This involved utilizing the ESP32's dual-core processing for enhanced efficiency and incorporating advanced features such as OTA firmware updates and FreeRTOS message queues. This project improved my skills in embedded systems and IoT solutions, cloud integration, and real-time operating systems.

Drought Prediction Model, *Python, Scikit-learn, Pandas, NumPy, Matplotlib, Seaborn*
Developed a binary classification model to predict drought levels using 20 years of meteorological timeseries and soil data from NASA as well as US Drought Monitor data. This project included all aspects of a standard data pipeline, from data wrangling, cleaning, and exploratory analysis to modeling. The most important features were identified using recursive feature elimination. Classification reports, confusion matrices, and ROC Curves were implemented to determine the best performing model, which was a Gradient Boosting model that achieved an 80% recall rate.

Water Quality Prediction Model, *Python, Scikit-Learn, Pandas, NumPy, Matplotlib, Seaborn*
Developed a binary classification model to predict water potability using a sample dataset from Kaggle.com. This project included all aspects of a standard data pipeline, from data wrangling, cleaning, and exploratory analysis to modeling. Due to the target feature being imbalanced in the dataset, synthetic minority oversampling technique was utilized to improve model performance. Additionally, a randomized grid search was used to tune the Random Forest Model hyperparameters. The trained model was able to achieve a 70% precision rate.

Desert Tortoise Biologist, ***Authorized Biologist/Project Lead,*** *NewFields 2015 - Present*
- Led teams of biologists in line transect surveys to collect data related to the Mojave Desert Tortoise, *Gopherus Agassizi,* and other species of interest such as burrowing owls, raptors, and various rare plants
- Conducted health assessments involving measuring tortoise size and weight, taking photographs, inspecting shell deformities, analyzing eye and nasal cavities for disease, gathering saliva and blood samples, collecting ticks, and attaching semi-permanent transmitters for future study
- Worked with construction crews on various solar projects to ensure the preservation of *Gopherus Agassizi*
- Utilized data collection applications and satellite imagery to document the location and status of desert tortoises

CERTIFICATIONS

CompTIA Project+: Developed project management skills and knowledge, focusing on the fundamentals of project lifecycle, resource management, and effective communication in business environments.

Axelos ITIL Foundation: Gained an understanding of the IT Infrastructure Library (ITIL) framework and best practices in IT service management and delivery.