Mustafa Arif

Phone: 248-525-1754 | Email: mustaf@umich.edu | Website: mustafaarifio.web.app

EDUCATION

University of Michigan - Ann Arbor Aug 2020 - Dec 2023
Bachelor of Science in Computer Science
GPA: 3.90

Related Coursework:

- EECS 281: Data Structures and Algorithms (C++)
- EECS 370: Computer Organization (C, ARM)
- EECS 376: Foundations of Computer Science (P-NP Problems, Encryption, Deciders)
- EECS 485: Web Systems (Python, React, HTML/CSS)
- EECS 445: Introduction to Machine Learning (Python, Neural Networks, Classifiers)
- EECS 482: Introduction to Operating Systems (OS, Concurrency, Threads)
- EECS 493: User Interface Development (Javascript, HTML/CSS, Iterative Design)
- MATH 214: Applied Linear Algebra (Matrix Multiplication, Least Squares Algorithm)

EXPERIENCE

Farida's Cake Boutique Website Apr 2023 - Aug 2023

- Designed a frontend single page web application using React and Material Design Bootstrap library to create a modern UI with increased responsiveness
- Engineered a RESTful API backend leveraging Django to enable seamless data processing, robust user authentication, and enhanced security measures
- Leveraged Amazon's Relational Database to establish a scalable and multi-user-supported infrastructure, ensuring data integrity and robust data management for user information
- Employed Amazon's Route 53 service to assign a domain name to the website while rigorously enforcing end-to-end data encryption via HTTPS, guaranteeing data security
- Deployed on AWS Elastic Beanstalk using EC2 instances and load balancers for efficient user request handling and seamless preparation for future scalability requirements

PROJECTS

Electromyography Classifier Program Jun 2022 - Present

- Collaborated with the University of Michigan's Neuroprosthetics team to design an interface translating electrical signals from a patient's residual limb into precise mechanical movements in a prosthetic arm
- Developed a Python-based machine learning program, employing scikit-learn, to interface with electromyography sensors achieving 95% accuracy, paving the way for seamless integration with future Python-native hardware solutions

Open Source Forum Backend May 2023 - July 2023

- Developed an open-source forum backend RESTful API using Django, facilitating efficient data management and user interaction
- Implemented seamless user registration and authentication through Google Cloud services, enhancing user onboarding and security while adhering to industry best practices
- Integrated Amazon SES (Simple Email Service) to automate and streamline account update notifications, ensuring timely and reliable communication with forum members
- Employed industry-standard coding practices, version control, and documentation to promote the project's accessibility and future contributions from the developer community

Convolution Neural Network for Landmark Images Classification Oct 2023 - Nov 2023

- Engineered a multi-layered convolutional neural network in PyTorch to accurately classify diverse landmark images and assign precise landmark labels.

- Implemented the Grad-CAM algorithm for visualizing image regions contributing to classifications, enhancing analytical insights
- Augmented data by converting images to their gray scale counterparts for better performance

Wikipedia Search Engine Clone Mar 2023 - Apr 2023

- Created a robust pipeline for computing the TF-IDF scores for each word within a series of Wikipedia articles by using natural language processing and data analysis
- Crafted a RESTful API using Flask to proficiently manage search query requests, facilitating the seamless communication of document matches ranked by relevance to users
- Engineered a dynamic server-side website enabling clients to search through Wikipedia pages, which seamlessly interacts with a REST API to deliver relevant user document results.

Technologies and Languages

- AWS
  - Amazon Simple Email Service: Can send custom emails to users on behalf of an application
  - Amazon Relational Database: Design a database for an application to perform read/writes on
  - Elastic Beanstalk: Can deploy a backend application that supports auto-scaling
  - Amplify: Can deploy a frontend application that supports auto scaling and auto updates with pushes to github
  - Route 53: Can obtain an SSL certificate for upgrading website protocol to HTTPS and acquire domain name
  - S3 Buckets: Can use S3 Buckets to serve static files globally with low latency
- C++
  - Can work at a high level with hash tables, command line arguments, C-string manipulation, implementation of heaps, dynamic memory, linked lists, iterators, dynamic programming, and stack/queues
- Python
  - Scikit Learn: Can use library to learn linear classifiers for binary and multiclass datasets
  - Django: Can develop a RESTful API using Django for applications
  - Pytorch: Can design and test neural networks using pytorch library
  - Pandas: Can leverage library to visualize and analyze large sets of data
  - Numpy: Can use numpy for performing efficient mathematical operations on arrays and matrices
- React
  - Can create frontend applications that interact with REST API's
  - Can create a Single Page Application using React
  - Can efficiently manage data obtained from backend locally for seemingly instantaneous response times while reflecting user changes to backend and/or database
- Other Skills
  - Linux: Can use linux shell and commands for project development eg. github commands
  - Shell/Bash script: Can create scripts that automate testing and database creation/deletion
  - Bootstrap: Can use CSS library to create modern looking web applications
  - Firebase: Can deploy a frontend application to Firebase with HTTPS and custom domain name