Nathan Litzinger

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EDUCATION

The Pennsylvania State University Expected: May 2023
Bachelor of Science in Computer Engineering *4.00 GPA*

RELEVANT WORK EXPERIENCE

Software Engineering Intern - IAM Robotics June 2021 - August 2021

- Extended and implemented functionality in fleet management Python microservices used to interface with, manage, and control autonomous mobile robots.
- Designed new front-end and back-end features to save developers' time and increase simulation productivity.
- Built async endpoints for Flask REST API and front end features using jQuery and Bootstrap.
- Implemented and tested robot software features in C++ to support new fleet management features.
- Collaborated with teams of developers in an agile development environment.

Software Engineering Intern - TMI Consulting July 2020 - September 2020

- Developed a VB.NET application as an updated invoice management system for a local automotive business.
- Implemented custom database control class to interface with Access database using various SQL techniques.
- Collaborated with end users to optimize user experience towards faster generation of invoices.
- Worked remotely and personally implemented tools to increase productivity (Trello, Git, Excel, and others).

RELEVANT PROJECT EXPERIENCE

Distributed File System September 2021 - December 2021

- Architected a Linux-like file system to abstract away raw disk interactions as POSIX file IO.
- Built disk controller instructions with bitwise operations and sent them to the disk using system calls.
- Implemented Unix OS API operations read and write by leveraging the file's inode data structures and instructing the disk to seek to tracks and read/write to sectors as required by the read/write call.
- Added an LRU cache as a doubly linked list with a node-address lookup table to reduce access latency.
- Integrated optional remote file system access using TCP stream sockets and subsequent network IO.
- Profiled file system performance using gprof to identify and refactor slow modules.

Server Utilization Indicating LED strips May 2020 - July 2020

- Leveraged Netdata REST API to obtain Unix system load metrics from server using ESP8266.
- Developed algorithm to interpret Unix load value and calculate a corresponding color hue.
- Utilized FastLED library to render color reflecting system load on WS2812B LED strips.
- Observed continuous-processing techniques with FastLED to create smooth color fading transitions between each API call.

FBLA Electronic Library Application September 2018 - December 2018

- Designed a single page application to manage the issuance of ebooks.
- Utilized NodeJS, ElectronJS, AngularjS, and SQLite.
- Carefully designed database schema with application/data flow in mind using forein and primary keys.
- Placed first in the state in Pennsylvania's FBLA coding and programming competitive event.

Assignment Completion Bot June 2018 - August 2018

- Designed and deployed a Flask web application that completes *vocabtest.com* assignments using Selenium.
- Utilized Python, the Flask Framework, jQuery, Gunicorn, and Nginx.
- Deployed on Ubuntu-Server VM. Later built on top of Python/Alpine Docker image.

VEX Robotics Challenge September 2017 - February 2018

- Collaborated with team members to design autonomous driving algorithm for robot.
- Utilized encoders, gyros, IR, sonarr, and other digital sensors to adapt behavior based on surroundings.
- Placed first in three regional VEX competitions.

TECHNICAL SKILLS

Languages
Python, C++, **C**, **JavaScript**, Visual Basic, Bash
Java, HTML, CSS, SQL, GoLang,

Software/Tools
Linux, Git, Regex, GDB, GProf, Make, Docker, Kubernetes, Proxmox, InfluxDb, Telegraf, GCP, Nginx, Arduino, ESP32, Vivado, MQTT, VSCode