JASHER GRUNAU

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Graduated in Computer Engineering from Virginia Tech. Robotics is my ultimate career goal, so I am seeking entry-level positions in Software Engineering, Hardware Engineering, Machine Learning, or any field that contributes to that career path

EDUCATION

Virginia Polytechnic Institute and State University

Bachelor's
Computer Engineering
Blacksburg, VA 24061
08/2013 to 08/2019

WORK EXPERIENCE

A.I. Forex Trading Developer

01/2019 to Present
Personal Project

Use Machine Learning techniques to predict relational inflation and deflation of currencies around the world. As the system accumulates data, it may become more accurate and useful to making wise financial investments.

- Mine data by sampling API and WebScrapping
- Extract data from public documents with multiple acclimated parsers
- Store data onto a MySQL Database (using MariaDB)
- Multi-thread the project environment and use FICO Queues to simulate multiple clients for future integration
- Quantify market predicting methods off of stability models, not classical models
- Simulate the market while making success measurable
- Visualize system processes in GUI for diagnostics and debugging
- Model numerical results to help understand what predictive methods work best
- Automate self optimization for a self-learning ability

Robot Stability Controller

09/2018 to 08/2019

Virginia Tech (Capstone Project)

Design a Proportional Integral Derivative (PID) controller within a mechanical rover's embedded software system. Must make the driving movements stable and accurate for it's simple path finding algorithm.

- Tune the rover's motor systems to consistently reach its coordinates with no more than +/- 1.0 cm error, every 30.0 cm of travel.
- Develop an embedded system on a PIC32 board with C programming and FreeRTOS
- Design low-level TCP communication to communicate with other Team members' PICs and my designed server system.
- Change P, I, and D constants in the embedded system through server communication for efficient debugging and testing.
- Send motor error real time to the server, and plot the error over time to see how to monitor the stability of the system.
- Use the stability plots to tune the PID control system via the PID constants on the server.

Reverse Proxy Server

04/2019 to 08/2019

Virginia Tech (Capstone Project)

Extra design project personally assigned to me by my professor. He said it would be good experience.

- Mediate between 4 different microcontrollers, a shared network database, and a computer for simulation and testing. UDP communication is mandatory among the low-level embedded environments, so a new communication protocol must be designed and tested.
- Establish connection with clients, multi thread communications, parse network packets, and process information
- Implement Flask server and communicate with the reverse proxy server via HTTP requests
- Added low-level checksum protocol to the JSON packages to verify package integrity
- Use MongoDB API for database implementation within the Flask Server

Computer Vision Developer in Robotics

11/2016 to 12/2018

Team RoboGrider

Work with my teammates in image processing development. We develop the autonomous ability of our robots' guns and turrets to target enemies without the use of a pilot. RoboGrinder is Virginia Tech's competitive robot team, primarily focused on the annual international robot battle competition: *Robomaster*. It's held during the summers in Shenzhen, China, and hosted by *DJI*.

- Use point processing, spatial filtering, and the frequency domain for digital enhancement.
- Employ color image processing for distinguishing enemies from teammates
- Segment images using edge detection, thresholding, and region segmentation
- Recognize enemy targets using morphology and a path-finding algorithm
- Work on team with a massive language barrier
- Document trips and handle technical writing to sponsors

2D Game Engine Developer

07/2018 to 12/2018

Virginia Tech (Senior Design Project)

Use the *Processing* library in Javascript to make a full functioning game. Made an effective way to develop a larger game by developing a design software. The final game can be played online here: https://jasherg7.github.io/game

- Construct an image drawing software with a full GUI for the use of other people wanting to contribute to the game. The software generates the processing code to be pasted back into the code of the game engine.
- Arrange world and actor classes in Object Oriented Design, and the collision detection system interacting between them
- Design Artificial Intelligence for NPCs
- Implement a Tile system for world map generation
- Use particle systems, noise reduction techniques, and other algorithms for graphical effect

MIPS Assembly Compiler and Simulator

01/2017 to 05/2017

Virginia Tech (Major Design Project)

Large individual project to simulate the MIPS Assembly compiler and its code execution.

- Code in C++, while using Git and CMAKE for the project management
- Create robust unit testing for 100% code coverage
- Write language parser for MIPS assembly language
- Use object-oriented design for command executions previously parsed
- Manually allocate memory in C++ and fix any measured memory leakage
- Design a UI using the Qt graphics library for an easier access for clients
- Multi-thread environment and measure increased program execution speed

Undergraduate Research Assistant

07/2015 to 05/2016

The Bradley Department of Electrical and Computer Engineering at Virginia Tech

Part time job in my professor's research team. Develop a drone that could deploy chain-linking Wifi to a network of cellphones in a blacked out area. I couldn't stay working there until project completion, because I was juggling another job.

- Program a Software Defined Radio (SDR) to meet the specs of the IEEE 802.11 standards for Local Area Network protocols.
- Set up the embedded environment of the drone to interact with and support the USRP.
- Attempt to apply the next generational concepts to the design to the USRP and test them with our network of cellphones
- Build framework for testing in simulated blackout scenario

Cloud-based Data Mining Network

Present

Personal Project (In Progress)

My personal server has a problem with data loss whenever my home loses power or whenever there are inconsistencies in my internet service. To have consistency in my data collection, I am migrating my data mining processes off of my server and onto the Google Cloud (and possibly onto others that offer free services). Each of the multiple micro cloud computers will be coordinating with my personal server to store all of the data onto a single, shared data pool. The pool stores onto the MySQL Database also running on my server.

Data Processing Android Network

Present

Personal Project (In Progress)

To save money in computer processing, I am designing a universal Android app to coordinate multiple scrap phones into a shared network. The android app will share the computing tasks among every client among the network, divvying out the processing among them. The measured success of each is stored back in the server's database for later Machine Learning analysis.

SKILLS

C programming - 4 years

Python - 4 years

C++ programming - 3 years

Javascript - 1 year

Java - 1 year

Git - 1 year

SQL - 1 year

MongoDB - 1 year

Apache - 1 year

HTML - 1 year

CSS - 1 year

Linux - 2 years

User Interface (UI) - 1 year

AWARDS

3rd prize for team RoboGrinder, ICRA 2019 International A.I. Challenge
07/2019

2nd prize for team RoboGrinder, Robomaster 2018 Final Tournament
07/2018

1st prize for team RoboGrinder, Robomaster 2018 International Regional Competition
07/2018

3rd prize for team RoboGrinder, Robomaster 2017
07/2017

Eagle Scout
02/2013

LINKS

https://jasherg7.github.io/