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Matthew Spencer

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OBJECTIVE

To find full-time employment as a remote or local research engineer in Electrical and Computer Engineering. My long-term goal is to continue doing research work relating to autonomous vehicle simulations, and in the meantime work diligently contributing to projects that make positive impacts within the world.

EDUCATION

Michigan Technological University — Houghton, MI
BS Computer Engineering — **Graduated May 2020**

Michigan Technological University — Houghton, MI
MS Computer & Electrical Engineering — **Graduated May 2022**
GPA: 3.75

PUBLISHED WORKS

MS Thesis: Off Road Autonomous Vehicle Modeling and Repeatability using Real World Telemetry via Simulation
Website: https://mpspencer93.github.io/Papers/.

- Measured the difference between a modeled autonomous vehicle's path execution in a UE4 simulated environment against its real vehicle counterpart at lowered simulation step frequencies.
- Presented research at the 2022 SPIE Defense and Commercial Sensing conference, where a condensed version of my work is being included in the conference's upcoming "proceedings" publication.

ENGINEERING WORK EXPERIENCE

Employer: Keweenaw Research Center — May 2018 - Present
Objective: To work together with many engineering disciplines developing government funded research projects.

- Designed and developed a UE4 real-time GPS simulation program utilizing UDP connections to a ROS microcontroller aboard a military vehicle.
- Created a custom puer-pursuit control implementation within a UE4 simulation that dynamically drives the vehicle based on previously recorded vehicle telemetry over an imported terrain mesh of a real environment. Uses programmed physics within UE4 while logging and recording simulation data during execution.
- Accurately simulated real world geometry obtained from 3D geo-located LiDAR and color data within UE4 by building a custom plug-in.
- Team lead on the development of a modular simulated LiDAR plug-in within UE4.
- Chartered the beginning of a custom 3D mesh editor application utilizing OpenGL and C++ for Windows.
- Created a web-based HTML application for full time employees to check out part numbers, where the server saves a record of previous parts for employee reference through the application.
- Helped an effort to find the time delta at the hardware level between two master clocks synced to local GPS.

ENTERPRISE PROJECT EXPERIENCE

Project: Husky Games Arcade Cabinet — September 2018 - January 2020
Objective: To develop and design an arcade cabinet to showcase video games created by Michigan Tech enterprise students.

- Was team lead on designing and implementing a custom user-interface for students to play and upload games onto the cabinet. The software used a mix of Python, C#, and C for the GUI and backend server architecture.
- Outfitted the cabinet with a custom computer utilizing USB arcade stick controllers running on Windows 10.
- Implemented the carpentry and design process necessary to create a retro-themed arcade cabinet for its visual arrangement and construction.

INTERNSHIP EXPERIENCE

Employer: Jackson National Life Insurance — October 2017 - May 2018
Objective: To assist full time employees in the development of financial software applications from a remote office located within Michigan Tech's "SmartZone" building.

- Was a java software developer for the "Output Solutions" team.
- Helped keep updated SQL databases for project development.

- Was a student team lead in testing/developing current software applications.

ENGINEERING PROJECT EXPERIENCE

Project: Campus Organization Website June 2017 - July 2017

Objective: To develop a website capable of tracking/managing musical dates, musician profiles, and scheduling events for an on-campus organization.

- Utilized CSS, PHP, HTML, JavaScript, and MySQL to complete the project.
- Constructed server-side code and a MariaDB database to handle profile information with PHP and MySQL.
- Successfully deployed the website onto a hosted server, providing technical support for the website until it was shut down in late 2018.

COMPUTER/TECHNICAL SKILLS

- C, C#, C++, ROS
- Java, Javascript
- Verilog, FPGAs, CANbus
- Bitbucket, Git
- Python, MATLAB
- UE4, OpenGL
- TCP/UDP Networking
- Digital Image Processing
- HTML, CSS3
- PHP, mySQL
- Windows/UNIX OS
- Artificial Intelligence

VOLUNTEER HISTORY

Homeless Shelter | Room at the Inn | Marquette, MI August 2015 - August 2016

His House | Marquette / Houghton, MI April 2015 – May 2019