SAMVIT VALLURI

📞 646-255-6305 ✉ samvit.valluri@gmail.com in linkedin.com/in/samvit-valluri 👤 Portfolio

Education

Purdue University   May 2022
Bachelor of Science in Mechanical Engineering   *3.50 GPA*

Skills

Technical Skills: Alteryx, SolidWorks, AutoCAD, CATIAv5, Creo, NX, Fusion360, ANSYSS, ABAQUS
Programming Languages: MATLAB Simulink, Python, C, C++, Pytorch, SQL

Projects

Car Detection AI   March 2024 – July 2024
- Constructed an AI to take in an image and highlight all the pixels where a car is present with a 97% accuracy
- Transformed adn preprocessed the training image and mask data using the albumentations library
- Implemented the U-NET convolutional neural network architecture for image segmentation using pytorch
- Visualized the performance data of the model by tracking the running loss in each epoch

Inverted Pendulum Simulation   January 2024 – March 2024
- Modeled and simulated an inverted pendulum on a cart system using C+
- Derived the differential equations that describe the system and conveted them into difference equations using the forward Euler method
- Linearized the equations to construct a closed-loop controller to stabilize the system and balance the pendulum using the motion of the cart

Connect 4 AI   January 2023 – March 2023
- Created a self learning AI in Python to play Connect 4 and find the optimal move
- Coded the game logic and exported the game state at each move to the AI
- Generated the game tree from the current state by scanning for all legal moves
- Implemented the Monte Carlo tree search by randomly selecting a node, expanding the node to an end state, and backpropagating to give the starting node a weight. The process was repeated 1000 times to converge on the best move

Mechatronics Robot   February 2022 – May 2022
- Designed and developed a physical prototype equipped with motors, a color sensor, a line sensor, and an Arduino to navigate and place objects when a certain color is detected on the floor to replicate practical applications such as that of a Roomba vacuum
- Created a digital twin of the prototype using Solidworks to create a 3D model, and KiCad for the electrical schematic, and used the model to assist with the machining and 3D printing of the necessary parts
- Developed a closed-loop PI controller using the feedback given by the motor as read by the Arduino and fine-tuned the parameters using Matlab Simulink to allow the robot to move in a straight line and turn at a precise angle as reliably as possible
- Coded in C++ for the Arduino using the ArduinoIDE to create a finite state machine to switch the robot's behaviors from moving, turning, detecting the current color, and placing the object using the inputs from the color and line sensors
- Finished in third place during the competition as the robot completed the course accurately in under 90 seconds

Purdue Space Program (SEDS), NASA Student Launch Team   August 2019 – December 2020
Avionics Sub-Team
- Created a MATLAB Simulink model using various rocket component characteristics and environmental characteristics to verify and validate the rocket trajectory obtained from OpenRocket and RAS Aero II
- Conducted various tests to ensure the working of components such as the altimeter, main and drogue parachute, and black powder charges to ensure the flight would meet the safety and technical requirements

Courses

Relational Databases and SQL   December 2024 – Present
Stanford Online

CS 221: Artificial Intelligence: Principles and Techniques   September 2022 – February 2023
Stanford Online

Control System Design   May 2023 – December 2023
Graham C. Goodwin

Awards & Certifications

Google Data Analytics Certificate   **Issued December 2024**
Google

Databricks Fundementals   **Issued December 2024**
Databricks

Alteryx Designer Core Certification   **Issued November 2024**
Alteryx

Fundamentals of Deep Learning   **Issued June 2022**
NVIDIA

Enrtry Level Programming in Python   **Issued December 2020**
Purdue University