ABHI PATEL

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B33Boy

Final year engineering student interested in developing skills to excel in the field of robotics and computer vision. Possesses a wide range of technical skills with strong fundamentals, complemented by excellent communication and teamwork.

Skills

PROGRAMMING LANGUAGES
Python
C++
C
MATLAB
Java
Shell Scripting
HCL

OS
Linux

LIBRARIES/TOOLS
Numpy, Matplotlib, Pandas
Keras, Tensorflow, PyTorch
ROS
Docker
Terraform, Vagrant
Flask

ELECTRICAL AND MECHANICAL
CAD (Solidworks, NX)
3D Printing
Engineering Project Management
PCB Design

COURSEWORK
Object Oriented Programming
Data Structures
Microprocessors and Digital Systems
Circuit Analysis
Control Systems
Kinematics and Dynamics of Machines
Numerical Methods
Sensors and Instrumentation
Actuators and Power Electronics
Real-Time Embedded Systems
Mechatronics Design
Mobile Robotics
Industrial Automation

CERTIFICATIONS
Machine Learning (Coursera)
Deep Learning Specialization (Coursera)
Object Oriented Data Structures in C++ (Coursera)

AWARDS
UofTHacks VI - 3rd place
NSERC Undergraduate Student Research Award

Education

Ontario Tech University — Sept. 2017 to Apr. 2022
BEng Mechatronics Engineering

Employment

Telus — Remote
Cloud Development Contractor — Jan. 2020 to Sept. 2020
- Wrote Terraform code to create GCP infrastructure (e.g. Stackdriver alerts and metrics, Bigquery datasets and tables, Cloud Storage buckets, PubSub topics, publishers, and subscribers) for the Telus Insights project
- Hosted knowledge transfer sessions on Terraform
- Assisting in API, and validation testing vendor code for ETL pipelines

Telus — Scarborough, Ontario
Data Engineering Co-op — May 2019 to Dec. 2019
- Followed IAC practices on Google Cloud Platform (GCP) for the Telus Insights project
- Gained experience with Apache Airflow data ingestion pipelines, Vagrant for virtual machine configuration, Terraform to define GCP infrastructure, and Docker for containerization based workflows
- Wrote python scripts to wrangle data from internal sites
- Followed git best practices and participated in code reviews

CAROBOT Learning and Research Organization — Markham, Ontario
Hardware Developer — May 2018 to Aug. 2018
- Applied the engineering design process to develop an Arduino car for students to assemble during class
- Taught the CR101, CR102, and CR201 Robotics and Programming classes

Projects

Handheld Laser Scanner — Sept. 2021 to Apr. 2022
- Worked in a team to design, develop and manufacture a low cost, variable range handheld laser scanner
- Generated an image processing pipeline to isolate a line laser
- Implemented pose estimation and triangulation to obtain point clouds of the target object

Maze Robot — Sept. 2021 to Dec. 2021
- Coordinated with a group to build a robot that can autonomously navigate a two-level maze in order to retrieve a figurine
- Produced schematics and performed electrical analysis
- Programmed the robot to follow walls using a PID controller
- Calibrated encoders and distance sensors to produce meaningful data

Data-Driven Algorithms Collection — Jan. 2020 to Current
- Implemented matrix factorizations, linear and logistic regression, K-means clustering, PCA, and Eigenface from scratch to better learn the inner workings of the algorithms

E-Chute — Sept. 2021 to Dec. 2021
- Designed, developed and manufactured a prototype of a real-time parachute release system through efficient collaboration with the team

Bus Trip Planner — July 2020 to July 2020
- Bus routes from the City of Brampton's Open Data portal were extracted and visualized
- Breadth-first and depth-first search were implemented to find potential routes

Self Driving RC Car — June 2018 to Aug. 2018
- Modified an RC car by attaching a Raspberry Pi to stream camera and ultrasonic sensor data to a computer over a TCP connection
- Solved a multi-class classification problem via the implementation of a neural network in Keras to output steering direction from the image inputs
- Interfaced an Arduino with the RC controller for computer controlled motion

Extracurriculars

UOIT Mars Rover Club · Junior Programming Executive — Oct. 2017 to Apr. 2019
- Implemented ROS nodes for sensor integration, navigation, and teleoperation
- Created a URDF model of the rover and simulated it on Gazebo and RVIZ
- Tested system consisting of stereo cameras, and LIDAR on the Jetson TK1 embedded development board
- Designed ROS coding challenge for new club members

UofTHacks VI - Hackathon — Jan. 2019
- Worked in a team to develop Pothole Pal, a proof-of-concept Arduino based robot that detects potholes and transmits their location to a mobile app