Sahil Patel

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Personal Statement:

Having carried out several modules on coding has enhanced my passion for the technology sector. I have completed modules such as Python Programming where I designed a 2D ping pong game. I am confident programming using Python, C++ and MATLAB. I am very keen about developing my coding skills in a challenging environment.

Education

UNIVERSITY OF BRISTOL (2018 – 2022)

- 2.1 in Mechanical and Electrical Engineering
- Modules completed included Robotics UG, BIO-Inspired Artificial Intelligence, Engineering Mathematics, Robotics and Control, Coding Theory, Electromechanical Design Project, Electromechanical System Design

WEMBLEY HIGH TECHNOLOGY COLLEGE (2011 – 2018)

- A-Levels: Maths – A*, Further Maths – A, Physics – A, Chemistry – A
- 7 A*, 12 A's in GCSEs

Projects

INDIVIDUAL RESEARCH PROJECT

- Used PSAT (a MATLAB Toolbox) to carry out load flow analysis on 9, 14 and 24 Bus systems to analyse effect of addition of wind turbines on the power quality of the system.
- Carried out all tasks from risk assessment to analysis and reporting of results, allowing me to experience all the steps involved for project completion
- Also used MATLAB and knowledge from Engineering Maths about iterative methods such as Guass-Seidel to validate results obtained from PSAT.
- Validation was carried out on a 3-bus system for problem simplification as there was a shortage of time. This allowed me to reflect on how to manage time better for next project.

GROUP RESEARCH PROJECT

- Characterised iron loss in different shrink-fitted stator materials by applying up to 56kN on I-beam shape
- Carried out stress analysis on I-beams using Autodesk Inventor to see the variation in Von Mises Stresses across the length of the beam
- Helped carry out stress analysis to find maximum stress under which the I-beam would buckle to ensure safe testing conditions. Methods involved Euler, Johnson and Rankine.
- Also created engineering drawings for the protective barrier which was to go around the 10-tonne hydraulic press.
- Project allowed me to further improve my collaboration skills as I had to communicate with my teammates regarding updates on my assigned tasks as well as communicating with the electrical lab staff for equipment purchasing.
- It was also important to keep the project budget within the given limit – this was important when considering equipment such as the load cell.
- Learnt about how to effectively present the reasoning behind option chosen when buying equipment.
- Also developed my presenting skills, as we had to give presentations to other staff regarding the research we had been carrying out.

PYTHON PROJECTS

- Coded Caesar Cipher for automated or manual encryption/decryption of given text. This familiarised me with coding using Python, as well as taught me the importance of having structured and maintainable code.
- Also designed a 2D ping pong game using the skills obtained
- Learnt how to create a simple GUI using the Tkinter module. as well as the designing of graphics and their implementation. Realised the importance of proper character/object design as the hitbox for the ping pong paddle was slightly smaller than the sketch for it, leading to slightly buggy performance where sometimes the connection between ball and paddle went unnoticed. This was fixed by improving the size matching between the hitbox and the paddle.

ROBOTICS UG PROJECT

- Programmed a microcontroller using C++ to allow robot to complete the line following challenge. Main steps involved line detection, line following, Odometry and PID implementation.
- Further project involved using the PID feedback signal to estimate slope angle and compare results to that produced using the onboard 3D gyroscope.
- Learnt about the importance of weight management to a robot, as well as about how functions of certain components, such as the gyroscope in this case, can be replicated using other means allowing you to remove it from the robot and minimise weight.
- Learnt how to use functions and classes effectively for neater code, allowing you to debug systems more easily. Also learnt about effectively using variable types to ensure effective use of storage space.

BIO-INSPIRED ARTIFICIAL INTELLIGENCE PROJECT

- Designed a prototype for image detection that can be used to distinguish between different animal species as well as potential humans so that it can be used in protection of animals.
- This taught me about the different steps of machine learning: data gathering, data filtering, creation of test and validation sets, training model, evaluating model and reporting results using confusion matrices.
- The goal of the research was to protect wildlife using autonomous drones which will monitor a large area, alerting rangers when there is an indication of potential poachers.
- Also helped design the prototype, which demonstrates the flock behaviour in different scenarios such as when poacher is detected.
- I developed my budgeting skills by creating a business plan detailing the budget required and how it will be used, as well as calculation of profits.

ELECTROMECHANICAL DESIGN PROJECT

- Designed a wind duct of variable outlet area which connects to a fan cooling a heat sink. This involved creating engineering drawings, creating model on Autodesk Inventor and 3D printing the model.

- Developed my collaboration skills by communicating with teammates to decide which task suited whose abilities best. Furthermore, we scheduled regular meetings to update about the current progress of each other's tasks and whether anyone needed help with their section,
- Improved my time management skills as I had to ensure that I allowed enough time for carry out the 3D print because there were many students carrying out 3D prints during this period and hence printer availability was very low. Furthermore, I left acquisition of M2 screws until after completion of 3D print which was a mistake as at the end there were none available and hence, I had to use paper clip as a substitute. This taught me the importance of early acquisition of any required materials.

Extra-Curricular Activities

BRISTOL ELECTRIC RACING

- Created the circuit design and built the circuit for the Ready To Drive Sound (RTDS) – This circuit is switched on when the car enters the ready-to-drive mode, and it produces a beep of 80dBA-90dBA for at least 1s.
- Helped design the pre-charge circuit as well.
- Learnt the importance of collaboration as I had to communicate with the Manufacturing team to find a suitable package space for this circuit to be fitted on the chassis
- I developed my time management skills which ensured the project was completed on time and within task budget and then presented to my supervisors for review
- Aimed to participate in Formula Student Competition From this experience final goal was to build a vehicle to participate in Formula Student

ROBOT WARS

- Competition to build and compete with a robot
- Learnt essential skills within project management from design concept to manufacturing, assembly and testing
- Improved CAD skills by designing the chassis of robot on AutoDesk Inventor.
- Developed my attention to detail by ensuring for the tolerance of 3d printed part being within spec.

Interests & Hobbies

I have recently taken up Krav Maga as I have always wanted to be learn a form of martial arts. I also go badminton or basketball once a week, which I find extremely enjoyable. I want to focus more on my physical fitness to lead a healthier lifestyle.