Pawan Gurung

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Education

University of Bristol: Engineering Mathematics Master's (MENG) – 2:1 **2019 - 2023**

Key Modules: Scientific Computing, Mathematical Data Modelling, Intro to AI, Further Computer Programming, Robotics Systems, Intro to Data Science, Applied Data Science, Applied Statistics

New College **2016 – 2019**

A Level: Mathematics (**A**), Further Mathematics (**B**), Physics (**B**)

Technical Proficiencies

- **Programming Languages**: Python, C, C++, HTML, CSS, MATLAB, SQL, JavaScript.
- **Tools & Technologies**: GitHub, Visual Studio Code, Linux, Data Structures, Algorithms, PyCharm, Unit Testing.
- **Certifications:** Responsive Web Design course by freeCodeCamp and currently enrolled in CS50 by Harvard University and JavaScript Algorithms and Data Structures by freeCodeCamp.

Projects

TECHNICAL PROJECT: INDIVIDUAL PROJECT *(PYTHON)* **September 2022 – April 2022**

- Conducted an evaluation of Proximal Policy Optimisation (PPO) to control an unstable deterministic genetic toggle switch (GTS).
- Employed OOP principles, enhancing code modularity and encapsulation, and extended OPENAI Gyn library functionalities for custom environment modelling.
- Evaluated PPO's performance by contrasting it with untrained PPO, PID, and relay controllers, with Integral Squared Error (ISE) serving as the performance benchmark.
- PID and Relay outperformed trained PPO, by approximately 55.36% and 71.43% respectively. But trained PPO outperformed untrained PPO by approximately 88%, suggesting MFRL holds potential in Cybergenetics.

SCIENTIFIC COMPUTING: INDIVIDUAL PROJECT *(PYTHON)* **February 2022 – May 2023**

- Successfully applied advanced numerical methods to real-world applications, optimising computational strategies for ODE and PDE problem-solving.
- Exhibited advanced programming skills in Python, enhancing complex-problem-solving and algorithm development capabilities.
- Applied mathematical concepts to software development, showcasing an ability to integrate cross-disciplinary knowledge into technical solutions.
- Proficiently employed GitHub for version control and executed unit testings to maintain quailty and reliability of the code.

ROBOTICS SYSTEMS: INDIVIDUAL PROJECT *(C++, PYTHON)* **March 2023 – June 2023**

- Devised a mathematical model correlating magnetic field magnitude and distance, yielding precise magnetic object localisation.
- Successfully developed a magnetic distance estimation model in Python, showcasing data analysis and modelling skills.
- Employed curve fitting to derive an exponential decay model, achieving estimations with high precision (1.85% - 6.23% errors).
- Programmed in C++ within Arduino IDE framework to implement magnetometer functionality.

RACFOUNDATION: GROUP PROJECT *(PYTHON)* **December 2021 – February 2022**

- Forecasted RACfoundations intricate fuel price utilising external data via LSTM, ARIMA and regression model.
- Led the LSTM approach and engineered a time series forecasting model using LSTM neural networks to predict fuel prices, handling data preprocessing, model training and performance evaluation.
- Applied Python libraries including TensorFlow, NumPy, Matplotlib and Scikit-learn.
- The LSTM maintained under 5% error for the first 195 data points, demonstrating suitability for mid and short-term forecasts.

Courses

RESPONSIVE WEB DESIGN: FREECODECAMP **September 2023 – January 2024**

- Developed web design skills, including HTML, CSS and responsive design techniques.
- Created responsive web projects to demonstrate proficiency in HTML and CSS. Viewable on my GitHub portfolio.

CS50: INTRODUCTION TO COMPUTER SCIENCE: HARVARD UNIVERSITY **October 2023 – Currently**

- Developing proficiency in Python, C, HTML, SQL, CSS and JavaScript, through various assignments and projects.
- Exposed to core concepts such as sorting and searching algorithms, linked lists, arrays, pointers, data structures, and databases.

JAVASCRIPT ALGORITHMS AND DATA STRUCTURES: FREECODECAMP **February 2024 – Currently**

- Gaining in-depth knowledge of JavaScript essentials, ES6, and fundamental programming concepts.
- Developing proficiency in algorithmic problem-solving and data structures, demonstrated through the projects, available in my GitHub.

Skills Summary

PROGRAMMING

- Proficient in Python, MATLAB, C++, C, HTML and CSS. Computed Python, C, C++, HTML and CSS code in many group projects and other individual projects.

PROBLEM SOLVING

- Competent in finding solutions to complex issues. Constantly trying to improve problem solving skills and programming skills through various projects.

MATHEMATICAL MODELLING

- High level core theoretical and applied mathematical skills learnt throughout academic career; translating mathematical knowledge into a solution to real life problems, developed through "Mathematics and Data Modelling" (three-year module) at university.

COMMUNICATION

- Experience in customer facing jobs, group projects and meeting industrial partners through various university projects; all requiring communication to a professional standard.

COLLABORATION

- Rich experience in working on group projects with industrial partners throughout academic career, all projects achieving a minimum of upper second-class merit.