Paula Amaya

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Education

HBSc in Computer Science & Mathematics **Sep. 2023 – Present**
University of Calgary *Calgary, AB*

Experience

Embedded Software Developer **Oct 2023 – Present**
University of Calgary Solar Car *Calgary, AB*

- Collaborate with a team of developers and electrical engineers in designing, implementing, and optimizing software solutions for electronic control systems using a **C/C++** development environment.
- Research and write documentation on out-of-the-box auxiliary battery management system (Orion **BMS**) and incorporate its data-gathering functionalities into the car's complex analytical ecosystem.
- Participate in the development of a custom master battery management system, participating in tasks such as providing a GND path, connecting batteries to solar arrays during charging, and linking batteries to motors during discharge.

Contributing Science Writer **Sep 2022 – Present**
The Dirac Dossier *Calgary, AB*

- Compose articles covering math and computer science according to agreed style, and keeping to strict deadlines.
- Research, analyze, and distill complex technical concepts into compelling and accessible narratives for broad readership.
- Work with editors and writers in creating data visualizations (illustrations, tables, and appendices) for publication into finished articles using **Python** and **MATLAB**.

Risk Strategy Intern **May 2022 – Aug 2022**
Wave Financial *Toronto, ON*

- Planned, developed, and delivered database documentation for 15+ tables stored in an Amazon Redshift warehouse.
- Developed 10+ relational database functions in **SQL** to streamline data analysis and improve reporting accuracy.
- Created and deployed a real-time analytics dashboard using **Python**, Numpy, and Pyplot. This tool contained 20+ metrics related to the company's most profitable payments line of business.
- Conducted regular data quality checks to ensure integrity and compliance with industry standards and regulations.

Projects

Rubik's Cube Solver | *Python, Numpy* **In Progress**

- Used principles of group theory to model the states of a Rubik's cube as permutations in **Python**.
- Implemented algorithms using **Numpy** to manipulate cube states. Each move applied to the cube is represented as a permutation operation within a specific group.
- Currently working on leveraging algebraic concepts so that the program systematically generates solutions to arbitrary cube configurations.

Theorem Prover in miniKanren | *Racket* **In Progress**

- Developed a basic proof checker for implicational minimal logic in miniKanren to explore the Curry-Howard correspondence between computer programs and mathematical proofs.
- Defined a custom grammar in **Racket** for representing proof expressions. Given a proposition and a proof expression, the program checks whether the proof is valid for the expression.
- Currently working on "backwards" functionality. Program will be capable of determining the logical soundness of any proposition and, if valid, generate a proof for it.

The Dirac Dossier | *React, NextJS, TailwindCSS, GraphQL* **November 2022**

- Developed and deployed a React web application for an online publication as per editor requirements.
- Designed and implemented a database schema optimized for efficient data retrieval, utilizing **GraphQL**.
- Integrated GraphCMS as a user-friendly content management system, ensuring easy maintenance by non-technical writing staff.

Technical Skills

Languages: Python, MATLAB, C/C++, HTML/CSS, JavaScript, SQL
Technologies/Frameworks: Linux (Arch), Git, ReactJS
Developer Tools: VS Code, IntelliJ, PyCharm, Github, Jira