Skyler Alderson

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Professional Summary

Enthusiastic and detail-oriented recent graduate with a B.Sc. in Physics and Computer Science from the University of British Columbia (GPA 3.90). Adept at developing data analytics tools, physics simulations, and collaborative software systems. Strong background in software development, experimental physics, qualitative research, and technical teaching. Passionate about astronomy and aerospace, software development, scientific inquiry, and teaching.

Education

University of British Columbia *September 2019 – May 2024* | GPA 3.90

- B.Sc. in Physics, Computer Science
- Dean's List honoree
- Select Comp. Sci. Coursework: Software Development, Parallel Computing, Data Structures, Database Systems, Web Design,
- Select Physics Coursework: Experimental Physics, Statistical Mechanics, Astronomy, Stellar Astrophysics, Electricity and Magnetism

Research Experience

Undergraduate Academic Assistant
University of British Columbia | Jan 2024 – Apr 2024

- Developed Python scripts for analyzing student-submitted code patterns.
- Led semi-structured interviews; performed thematic analysis of transcripts and surveys.
- Contributed to a research project aimed at improving physics labratory pedagogy.

Advanced Undergraduate Laboratory Work
University of British Columbia | 2022 – 2023

- Created a pair of mutually coupled loop-gap resonators to investigate wireless power transfer efficiency.
- Used a scintillator and statistical analysis to detect and calculate the lifetime of muons.
- Performed work on hyper-sensitive equipment such as a torsion balance to obtian Gravitational constant.
- Investigated Faraday rotation of light through various media within a magnetic field.

Technical Projects

Capstone Project: SQL/RelAlg Editors & Auto-Grader
University of British Columbia | May 2023 – Aug 2023

- Built interactive SQL and Relational Algebra editors in JavaScript.
- Developed a Python backend for procedurally generating randomised databases and associated questions.
- Created Python scripts to accurately grade student submission for both preset and randomised questions.
- Integrated CI/CD thorugh DroneCI and automated regression testing.
- Group achieved the highest project grade in class.

Personal Software Projects

- Built Newtonian and relativistic orbital simulators including a project modeling hypothetical interstellar ion-ramjet spacecraft.

- Created novel algorithm to intelligently select image palettes during downscaling; trained custom neural networks to recognise unique character sets.
- Worked on several miscellaneous simulation-based projects: lower bound on mine density in infinite grid Minesweeper; optimal strategies in classic card games such as Cribbage and four-card Gold.
- Computationally challenging problems such variants of the unsolved Magic Square mathematics problem and finding sets of pangrams with restrictions.
- Several Minesweeper implementations including a quantum variant, procedural skeletal animation framework for Picotron, API to transform 16-bit PICO-8 computer system into a 64-bit system.

Teaching Experience

Teaching Assistant – Experimental Physics
University of British Columbia | Sep 2022 – Dec 2023

- Led two undergraduate labratory sections in experimental physics.
- Graded assignments, created lecture slides, and guided students in lab technique and analysis for multiple physics and computer science courses.

Web & Design Work

Frontend Volunteer – iGEM UBC Okanagan Team
iGEM Competition | Oct 2022

- Designed HTML/CSS frontend for the iGEM wiki site.
- Helped team win a Gold Medal at the iGEM 2022 competition.

Skills

- **Programming Languages:** Python, Rust, Lua, Java, JavaScript, C, bash, zsh.
- **Data Analysis & Tools:** NumPy, SciPy, Matplotlib, Jupyter, Excel, Google Sheets.
- **Web & DevOps:** HTML/CSS, Git, GitHub, Docker, DroneCI.
- **Research Methods:** Thematic analysis, semi-structured interviews, experimental design, simulations and modelling, data fitting.
- **Languages:** English (native), French (DELF B2).