ALEJANDRO SALAZAR
MSc Physics, Applied Physics and Software Development

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OVERVIEW

Entry-level applied physicist and software developer with experience in scientific modelling, data analysis, and computer simulations as a research assistant during my education. My proficiency extends to the creation of software algorithms (Python, C++, Matlab, Mathematica) for testing of models, data analysis (including database management through SQL), simulating dynamic processes, and creating interactive programming solutions. I am a fast learner and I thrive when I take challenges. I am also self-motivated and can work independently when needed. I am passionate about serving and helping others. During the last two years I volunteered as an assistant baseball coach and worked as a teaching assistant and nothing fulfilled me more than listening to others, providing solutions, and seeing the players and students succeed and reach their potential. I am a dedicated and constant learner. I am always upgrading my knowledge in programming and learning new programming languages and tools to be the best at solving the ever-evolving challenges of our technological modern world. I am detail-oriented, organized, and strongly committed to meeting deadlines with excellence in my work, applying my skills and knowledge to deliver innovative solutions.

CORE QUALIFICATIONS

- Master's degree in Applied Physics in software development with a first class honors bachelor's degree in Physics
- Experience as a research assistant (4 years) and teaching assistant as part of my university education
- Application of mathematical modelling and analytical knowledge in data and software development
- Knowledge of C++, Matlab, Python, Mathematica/Wolfram, and LaTeX in applications of algorithm development for dynamic problems and data analysis. Hobbyist experience through internet courses in JavaScript and simple Game Development
- Proficiency in writing Python, C++, and Matlab scientific code, with knowledge of the necessary libraries and packages (see Technical Skills)
- Proficiency in English, French, and Spanish
- Interactive programming, function/curve fitting, Monte Carlo simulations, error analysis and uncertainty quantification, optimization techniques, statistical evaluation/analysis of large data sets (SQL and Python), machine learning in noise reduction and algorithm efficiency improvement

TECHNICAL SKILLS

- Python, C++ (with application to micro-controllers), MATLAB/Simulink, SQL, Mathematica/Wolfram, LaTeX
- Programming libraries: Pandas, SciPy, NumPy, Matplotlib, SQL, Alchemy, ScientificPython
- Computer operating systems: Windows, Mac, Linux
- Hobbyist experience in electronic printed circuit boards (PCB) design
- Hobbyist active learning of artificial intelligence and JavaScript
- Vector Graphics (SVG) and 3D design: Fusion360 and Inventor (CAD), 3D printing, Inkscape, Affinity

LICENCES & ACCREDITATION

- **Graduate Teaching and Learning Program Level 1: Foundations**, University of Alberta, 2022
- **Laser Safety,** University of Alberta, 2022
- **Workplace Hazardous Materials Information System (WHMIS),** University of Alberta, 2022

WORK EXPERIENCE

RESEARCH ASSISTANT

University of Alberta/European Organization for Nuclear Research, 2019- 2023

- Developed and authored innovative computer algorithms for state-of-the-art detectors valued in $5 million at the Large Hadron Collider in Geneva. Utilized C++, Matlab, and Python programming languages
  - Statistical analysis
  - Conducted efficiency algorithm improvement tests, from prototype to its finalization, for signal noise filtering and reduction (with cosmic rays), and location of detections
  - Conducted comprehensive computer-based experiments/simulation studies in light propagation and detection for predicting the detectors' behaviour at the time of operation
- Engineered (design, construction, and implementation) cost-effective pulsed-laser solutions for the evaluation the photodetectors
  - Designed the electrical network that successfully maximized the sensibility of detectors while keeping noise minimized
  - Successfully pinpointed the photodetectors' (tubes and silicon-based) optimal voltage operation levels
  - Successfully repaired electronic circuit boards
  - Utilized CAD software to create 3D tools for resolving engineering challenges related to the detectors
- Delivered weekly progress reports in written and oral form to Canadian and international collaborations in North America and Europe

GRADUATE TEACHING ASSISTANT

University of Alberta, 2020-2022

- Designed advanced physics experiments and wrote their corresponding laboratory manuals for a second-year honors physics university-level laboratory course
- Demonstrated leadership by effectively supervising and instructing groups of over 20 students three times a week
- Taught essential skills such as data analysis and uncertainty evaluation (utilizing Excel and Python), 3D modelling (CAD), and experimental techniques within a laboratory environment
- Honoured with the prestigious Graduate Teaching Award by nomination from both students and faculty members, for showing creativity, leadership, and strong communication skills
- Innovatively optimized laboratory resources by repairing and enhancing 3D printing and laser-engraving equipment

AWARDS & ACHIEVEMENTS

- Graduate Teaching Award, University of Alberta, 2023
- Dean's Silver Medal in Science, University of Alberta, 2020
- SUPRE (Summer Undergraduate Research Experience) Award, University of Alberta, 2019
  Dean's Honor Roll, University of Alberta, 2017-2019
- University of Alberta Transfer Award, 2016

EDUCATION

- **MASTER'S IN SCIENCE- PHYSICS**, University of Alberta, Edmonton, 2020-2023
- **GRADUATE VISITING STUDENT**, University of British Columbia, Vancouver, 2020-2021
- **BACHELOR'S IN SCIENCE- PHYSICS (FIRST CLASS HONORS)**, University of Alberta, Edmonton, 2016-2020