ALBERTO ESPINOSA DE LOS MONTEROS

Contact: alberto.espinosa@colorado.edu | +1 970 771 6665 | F-1 Student Visa with OPT Work Authorization

EDUCATION: University of Colorado Boulder, **BS Computer Science, Minors: Business & Comp Eng**, May 2025 **GPA: 3.435/4.0**

TECHNICAL SKILLS:

- **Languages:** C/C++ (Proficient), Python (Proficient), Java (Intermediate), Scala (Intermediate), Verilog (Beginner), Swift (Beginner), and CodAL (Proficient).
- **Web Development:** HTML5, CSS3, React.js, Angular, Node.js, Bootstrap, AJAX, JavaScript
- **Analytics & DBs**: NumPy, Scipy, Seaborn, Pandas, Matplotlib, and Scikit-learn. MySQL, PostgreSQL, Cassandra, MongoDB.
- **Networking:** LAN/WAN, TCP/IP, UDP, IPv4/IPv6, DNS/DHCP, ARP, NAT, and DHT
- **Embedded & Robotics Frameworks**: RTOS, Microcontrollers (ARM Cortex-M4, STM32), CAD, UART/USART/SPI/I2C, ROS (Webots), CodAL (RISC-V ISA), and ADAS technologies (LiDAR, Radar, Computer Vision, RRT, ML, SLAM, IK)
- **Development Tools:** Git, Jenkins, Docker, JIRA, Agile, UML

RELEVANT EXPERIENCE:

Programmer | *Fully Autonomous Robot in Python* | Boulder, CO | 08/2023-12/2023
- Programmed a TIAGo Robot to autonomously scan, map, and retrieve objects from a simulated 3D supermarket using LiDAR-based mapping with 90% Accuracy.
- Developed a 2D map representation of the supermarket for navigation and path planning.
- Implemented computer vision-based Color Blob Detection to identify objects on shelves.
- Utilized the RRT algorithm to compute optimal paths to target objects.
- Applied Inverse Kinematics to control the robot's arm for object retrieval in Cartesian space.

Data Science | *EDA on Smoking Habits in the UK in Python* | Boulder, CO | 05/2023-08/2023
- Conducted comprehensive exploratory data analysis (EDA) on UK smoking habits using Python.
- Cleaned and pre-processed the data, then I applied univariate and multivariate analysis to uncover insights on categorical and numerical variables.
- Visualized relationships between variables using libraries like NumPy, Pandas, Seaborn, and Matplotlib.
- Delivered statistical insights on smoking trends, including center and dispersion measures, to inform public health discussions.

Embedded Systems Developer | *STM32 Board Project in C++* | Boulder, CO | 01/2024-05/2024
- Developed a Tic-Tac-Toe game on the STM32F429i Discovery Board, integrating peripherals via HAL, external interrupts for input, and timers for gameplay timing.
- Designed an intuitive user interface on the LCD screen for game mode selection, live gameplay, and result display.
- Created an AI opponent with RNG-based logic, ensuring a dynamic single-player mode.
- Debugged and optimized the system using STM32CubeIDE for seamless functionality.

Systems Developer | *UDP Client-Server Connection in C* | Boulder, CO | 01/2024-05/2024
- Developed a UDP-based client-server system replicating core FTP functionalities, enabling file upload, download, and management.
- Implemented socket programming to facilitate client and server communication.
- Designed a reliable UDP connection by using a stop-and-wait mechanism. Adding features like packet ACKs, retransmission, windowing, and flow control.
- Optimized file transmission speeds and ensured error handling for more than 100MB file transfers.

Computer Architect | *RISC-V ISA Processor Modeling in CodAL* | Boulder, CO | 01/2024 – 05/2024
- Modeled instruction-accurate and cycle-accurate RISC-V processor with core R-type and I-type instructions (ADD, AND, OR, XOR), branching (JAL, BEQ), and memory operations.
- Developed pipeline forwarding logic to resolve data hazards and optimize instruction throughput.
- Designed and verified cycle-accurate models for performance-critical operations, ensuring precise timing and functionality.
- Implemented and tested data memory and ALU components, enhancing reliability and performance.

LEADERSHIP EXPERIENCE:

Division 1 Rugby Player *University of Colorado Boulder* | 08/2021 – 06/2022
- Demonstrated leadership, teamwork, and discipline as a committed player in Division 1 Rugby, contributing to both practice and game strategies.
- Fostered team cohesion and acted as a mentor for new players, helping them improve their skills and adjust to the team environment.

BOLD Scholar, *Society of Hispanic Professional Engineers* | 08/2020 – Present
- Demonstrated academic excellence and served as a role model for Hispanic engineers..
- Promoted professional development by being part of workshops and networking events aimed at empowering Hispanic students in STEM fields.
- Demonstrated academic excellence and served as a role model for Hispanic engineers.

Learning Assistant, *University of Colorado Boulder* | 08/2021 – 12/2021
- Held weekly office hours (6 hrs/week) to provide academic support to peers, helping them understand challenging topics.