

ALBERTO ESPINOSA DE LOS MONTEROS

Contact: alberto.espinosa@colorado.edu | +1 970 771 6665 | **F-1 Student Visa** with OPT Work Authorization for **36 Months**.

EDUCATION: University of Colorado Boulder, **BS Computer Science**, Minors: **Business & Comp Eng**, May 2025 **GPA: 3.486/4.0**

TECHNICAL SKILLS:

- **Languages:** C/C++ (Proficient), Python (Proficient), Java (Intermediate), Scala (Intermediate), Verilog (Beginner), Swift (Beginner), & CodAL (Proficient), & JavaScript (Proficient)
- **Analytics & DBs:** Scikit-learn, NumPy, Pandas, Matplotlib, Seaborn, OpenCV, MySQL, PostgreSQL, Cassandra, & MongoDB.
- **Networking and Frameworks:** LAN/WAN, TCP/IP, UDP, IPv4/IPv6, DNS/DHCP, ARP, NAT, DHT, HTML5, React, & Node.
- **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 & Frameworks:** Git, Jenkins, Docker, JIRA, Agile, Docker, Kubernetes, & AWS.

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.

Project Manager & Developer | ML for Disaster Relief | Boulder, CO | 08/2024 – 12/2024

- Implemented machine learning models (Random Forest, Gradient Boosting, SVM) to predict disaster risk and optimize resource allocation using EM-DAT historical data.
- Achieved 60% accuracy with Gradient Boosting Classifier for disaster severity prediction; identified key factors like affected population and disaster duration.
- Conducted data preprocessing, feature selection, and class balancing to improve model performance and highlight disaster trends for resource planning.
- Applied a comprehensive exploratory data analysis (EDA) on EM-DAT dataset to identify critical features and patterns.

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.

Football Team Captain, *Summit High School*, Breckenridge, CO | 08/2018 – 06/2020

- Led the football team by organizing and conducting weekly practice drills, focusing on developing core skills such as tackling, blocking, and agility.
- Implemented a mentorship program ("Big and Little") to foster leadership among upperclassmen and promote team unity by pairing younger classmates with senior mentors.

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.