Caleb Curran-Velasco

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Education

Colorado School of Mines, Golden, CO - *M.S. Computer Science* — **May 2025**
- **Specialized in Machine Learning and Artificial Intelligence** — **GPA: 4.0**

Colorado School of Mines, Golden, CO - *B.S. Computer Science* — **August 2024**
- **Inaugural member of the Presidential Grewcock Scholarship Program** — **GPA: 3.66**
- **Areas of Interest:** Machine Learning | Computer Vision | Software Engineering | Data Science — **Cum Laude**

Experience

Cloud303, Lakewood, CO - *Software Engineering Intern* — **June 2024 - Present**
- Designed and implemented Docker Swarm solutions to containerize multiple services, utilizing Traefik as a reverse proxy on AWS EC2 instances.
- Designed and automated the deployment of CrowdSec into our system, an open-source security tool, to enhance real-time threat detection and mitigation against various cyber threats.
- Developed automated AWS EC2 deployments using TypeScript and AWS SDK, streamlining the deployment of Traefik and CrowdSec, improving client security and resilience, resulting in a 1000% increase in deployment efficiency for Cloud303 clients.

Northrop Grumman - *Field Session at Mines* — **May 2024 - June 2024**
- Collaborated with Northrop Grumman to develop an autonomous robbery vehicle detection, tracking, and interception system using machine learning and computer vision techniques while following Agile development practices.
- Built a detailed urban city simulation in Unity to model real-world environments to test the AI models.
- Designed and implemented a custom YOLOv8 model with real-time multi-object centroid tracking, leveraging predictive algorithms to calculate optimal intercept routes for cop vehicles, resulting in an 89.34% interception rate of robber vehicles in simulated scenarios.

Grewcock Presidential Scholars Leadership Program - *Colorado School of Mines* — **August 2020 - May 2024**

Sponsor: Bruce Grewcock | former CEO of Kiewit Corporation
- One of 10 inaugural recipients of a full tuition and fees scholarship for outstanding leaders in STEM.
- Growing and developing leadership, communication, and other professional skills through weekly meetings with CEOs, advisors, and mentors.

Firm Foundations LLC, Colorado Springs, CO - *Owner and Manager* — **January 2015 - September 2019**
- Started a vending machine business and learned about accounting, inventory, and customer service.

Skills

Software - Python | C/C++ | Java | OpenCV | Amazon web services | Docker | Automation | Linux | R-Studio | Agile
Bilingual / Soft - Fluent in both English and Spanish | Adaptable | Self-motivated | Positive | Problem Solving | Curious

Projects / Research - **Visit calebcurranvelasco.github.io or github.com/CalebCurranVelasco for more information**

Breast Cancer Prediction Web Application
- Developed a machine learning model using linear regression to predict breast mass benignity based on cell nuclei measurements to assist medical professionals in diagnosing breast cancer.
- Created a user-friendly interface for real-time model interaction and data visualization by allowing users to modify cell nuclei measurements.

Facial Recognition
- Developed a real-time facial recognition system using Python and OpenCV, integrated with a Raspberry Pi and webcam, allowing for accurate detection and identification of individuals.
- Implemented Haar Cascade-based face detection to locate faces in video frames and employed a Local Binary Pattern Histogram (LBPH) face recognizer to recognize and identify individuals with high precision.

Undergraduate Research Assistant - **Research Professor: Mike McGuirk | cmmcguirk@mines.edu**
- Contributed to research to develop synthetic alternatives to plastic recycling working as a research assistant for the McGuirk Group and co-authored the publication "The Overlooked Potential of Sulfated Zirconia: Reexamining Solid Superacidity Toward the Controlled Depolymerization of Polyolefins" (ACS Publications, March 2024).

GPT Fun Web Application
- Leverages large language models like gpt-3.5 and the OpenAI API for semantic search and question answering.
- Includes symptom based medical diagnosis predictions and allows users to extract insights from various sources of information such as PDFs, YouTube videos, and URLs with a user friendly interface.