

# Casey Arbelaez

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## EDUCATION

### Northwestern University

*Bachelor of Science in Computer Science & Mathematics*

Evanston, IL

Jun. 2027

**Relevant Courses:** Data Structures and Algorithms, Data Management, Differential Equations, Machine Learning, Probability and Stochastic Processes, Probabilistic Graphical Models

### Doral College

*Associate in Arts - Summa Cum Laude*

Doral, FL

Aug. 2020 – May 2023

## SKILLS

**Languages:** Python, Excel, JavaScript, HTML/CSS, Matlab, SQL, C/C++, R, C#

**Developer Tools:** VS Code, PyCharm, Jupyter, RStudio, Git, Quarto

**Interpersonal:** Creativity, Communication, Teamwork, Leadership, Problem-Solving, Accountable, Detail Oriented

## EXPERIENCE

### Software Engineering Intern

Jun. 2024 - Aug. 2024

*Pixel Neon Studios — Glenvar Heights, FL*

- Deployed a full-stack open source web application with a Flask backend using Python, HTML, JavaScript, and CSS for calculating distances for LED neon sign cuts, enabling users to upload NGC and G-code files.
- Implemented functionality to parse files, extract coordinate points, and calculate distances, improving workflows by 20% by eliminating the need for manual measurement after manufacturing processes.
- Designed a user-friendly interface with metric customization and a visualization graph for precise measurement confirmation, significantly enhancing user experience.

### Data Analyst Intern

Jun. 2023 - Aug. 2023

*Pixel Neon Studios — Glenvar Heights, FL*

- Accomplished a 10% increase in internal productivity by implementing an Inventory Management System using Excel on 200+ different items.
- Built an parsing algorithm to extract Excel data and generate low-stock alerts to autonomously track inventory levels with the goal of reducing required storage space through placing quantitatively informed decisions.

## PROJECTS

### Credit Card Fraud Detection Model | R

Jun. 2024 - Sep. 2024

- Analyzed credit card transaction data to develop a fraud detection KNN model using exploratory data analysis and data preprocessing techniques, achieving over 91% accuracy in the test data.
- Utilized UMAP and PCA transformations to identify clusters within the dataset, fine-tuning multiple models and evaluating their performance with confusion matrix results to select the most accurate fraud detection model.

### Portfolio Optimization Program | Python, SciPy, Yahoo Finance, NumPy

Nov. 2023 - Jan. 2024

- Integrated a stock portfolio optimization program that reduced portfolio risk by 5% on average by utilizing Markowitz Optimization and leveraging statistical methods to allocate assets efficiently.
- Employed advanced quantitative techniques by incorporating a Sequential Least Squares algorithm to fine-tune portfolio weights, maximizing returns while minimizing risk in dynamic market conditions.

### Digit-Recognizer with Machine Learning | Python, NumPy

Jun. 2023 - Oct. 2023

- Constructed a 2-layer Neural Network, from scratch, to recognize hand-written digits on a 28x28 pixel grid, achieving over 90% accuracy.
- Leveraged advanced optimization algorithms, such as stochastic gradient descent with momentum, to fine-tune model parameters, resulting in a 5% improvement in accuracy over baseline implementations.

## HONORS AND AWARDS

### QuestBridge National College Match | Awarded by QuestBridge

Dec. 2022

- Awarded a full-ride scholarship for high achieving, first-generation, low-income students.

### National Hispanic Recognition Award | Awarded by College Board

Aug. 2022

- Identifies and honors Hispanic students who have a 3.5+ GPA and scored highly on the PSAT exam.