

*I am a driven Computer Science student with a deep commitment to research. I aim to pursue a Master's degree with a vision of a Ph.D. My research in Algorithmic Optimization in Machine Learning and Theory reflects my dedication to advancing Computational Complexity and its tangible applications in industry and academia.*

## EDUCATION

### California State University, Fullerton

Fullerton, CA

Bachelor of Science: Computer Science; Minors in Applied Mathematics (2022-2024)

May 2025

**Relevant Coursework:** OOP and Data Structures in C++, Java, and Python, Discrete Mathematics and Linear Algebra, Physics 1 (Calc-Based), Databases, Software Engineering, Algorithm Engineering (C++, Java, Python), Data Science in R and Python, Differentials and Multivariable Calculus, Artificial Intelligence(In Progress), Machine Learning (Spring 25), Theory of Computation (Spring 25), Computer Communications (Spring 25), Backend Engineering (Spring 25).

## PROFESSIONAL EXPERIENCE

### UCI/ CSUF- SoCal Data Science Research Program

(June 2024 - July 2024)

- Collaborated with faculty from UC Irvine and CSU Fullerton to develop a **Response Prediction Model (RPM)** for calculating the Column Drift Ratio (CDR) of box-girder, non-skewed, seat-type ordinary bridge structures, directly predicting seismic responses without relying on traditional Intensity Measures (IM).
- Assisted the Department of Civil Engineering by creating a **Data Science** approach for the Intensity Measure calculations for bridge collapse.
- Presented the results at a research symposium and co-authored a technical paper, proposing a computational approach that reduces the complexity and time required for structural response calculations, achieving a 0.947 correlation between predicted and actual CDR values.

### CSUF-ECS CIC-PICUBED Research Mentor, Data Science

(June 2023 - July 2023)

- Mentorship: Guided incoming and transfer students through their initial research projects, facilitating a smoother transition into the academic and research environment. With four more mentors, I mentored **~30 students** in 2023 and **~40 students** in 2024.
- Data Selection and Analysis: Identified and curated suitable datasets for various research topics.
- Funding and Recognition: Awarded an **Independent Research Stipend** of approximately \$1000, recognizing the significance and impact of the research mentorship role.

## RESEARCH EXPERIENCE

### CSUF Dept of Mathematics Research Assistant, Theory of Computability

(January 2023 - October 2024)

- Research Verification: Verified results of published research papers, identifying and correcting mistakes in existing theories and findings.
- Algorithm Optimization: Developed and coded algorithms to increase research efficiency, successfully transforming a previously **NP-complete problem** to a problem solvable in **polynomial time (P)** using the **Newton-Raphson Method**.
- Conference Presentations: Presented research findings at the **Southern California Conferences for Undergraduate Research** in November 2023 and the **National Conference for Undergraduate Research** in April 2024, funded by UROC-CSUF.
- Independent Research: Undertook an independent research semester in Spring 2023, working on **mathematical theory** and its applications in Computer Science.

### ECS Instructional Student Assistant (ISA)

(August 2023 - Present)

- Tutored a diverse range of undergraduate courses, including **Compilers, Discrete Mathematics, Linear Algebra**, Multivariable Calculus, **Algorithm Engineering, Statistics**, Object-Oriented Programming (OOP) in C++, Data Structures (C++ and Python), and Databases.
- Provided one-on-one and group support, simplifying complex concepts and fostering a deep understanding of the material for students.
- Assisted with course assignments and exam preparation, improving student performance by reinforcing core concepts and problem-solving techniques.

### CSUF-ECS ASSURE-US Summer Research Experience- Student Researcher

(June 2023 - August 2023)

- Participated in a competitive, **faculty-led research program** to foster collaboration between students and faculty.
- Conducted independent research projects, developing expertise in data science and machine learning techniques.

### High School- Software Architecture Research Intern

(May 2021 - August 2021)

- Data Collection and Bug Testing: Collected data from software codebases, meticulously tested the software, and reported identified bugs to the development team to enhance software quality.
- Research Documentation: Documented research processes and findings in detailed reports, aiding in advancing the project's goals and providing valuable insights for future research.

## LEADERSHIP EXPERIENCE

### CSUF Women in Computer Science and Engineering

(June 2023 - July 2023)

- Project Lead and Presenter: Identified and curated suitable topics in need for various presentations and workshops.
- Mentorship: Reinforced efficient programming strategies and study habits to enhance students' ECS experience.

### CSUF Outreach Lead, ECS Diversity Summit

(November 2023- Present)

- Leadership: Conceptualized and implemented a comprehensive outreach strategy to maximize and boost attendance by **300% (50 to 200 students)**
- Campaigns: Created targeted promotional materials like flyers and emails with RSVPs and spearheaded the panel talks and speeches.

## PROJECTS

**Wordle Replica:** Developed a clone of the popular word-guessing game Wordle, where users attempt to guess a **5-letter word in 5 tries**.

Implemented a dynamic word library featuring over **10,000 unique words**, ensuring a varied and challenging user experience. Built using HTML,

CSS, and JavaScript, with game logic that **provides real-time feedback** on each guess by indicating correct letters and positions. Designed with a scoring system to track player progress and **display streaks**, enhancing player engagement and competitiveness.

Long COVID-19 Prediction Model: Developed a logistic regression model using 2,700 responses from the CDC Pulse Survey to predict long-term COVID, defined as symptoms lasting over three months. Key predictors included symptom severity, gender, and household income, achieving 79% accuracy, 23.3% sensitivity, and 95.9% specificity. The model found that females and those with lower incomes were more likely to experience Long COVID, providing valuable insights for public health strategies.

Predicting Column Drift Ratio (CDR) for Bridges: Analyzed **69,000+ data points** from the Pacific Earthquake Engineering Research (PEER) NGAWest-2 database, including 22 parameters (14 earthquakes, six sites, and two bridge variables). Applied machine learning techniques such as **Linear Regression with LASSO** and **Generalized Additive Models (GAM)**, achieving a 0.90 adjusted R<sup>2</sup> and a Mean Squared Error (MSE) of 0.77 for the GAM, improving prediction accuracy compared to the linear model.

Fractran: Developed a FRACTRAN program to compute the decimal expansion of  $\sqrt{2}$ , building on John Conway’s work in **esoteric programming** languages. Implemented and extended Conway’s PIGAME, using **Catalan's infinite product expansion** to improve the efficiency and simplicity of calculating  $\sqrt{2}$ . Created two distinct programs,  **$\sqrt{2}$ GAME and NR $\sqrt{2}$ GAME**, which utilize FRACTRAN to compute the decimal digits of  $\sqrt{2}$  through Catalan’s product formula and the Newton-Raphson method. Explored Turing completeness of FRACTRAN by encoding mathematical algorithms, including a **flowchart** that maps complex computations to fraction-based operations. Presented findings and a simplified proof for John Conway’s PIGAME, optimizing the algorithm for faster approximations of  $\sqrt{2}$ .

**SKILLS AND RECOGNITION**

**Skills:**

**Languages:** Java, Python, R, C++

**Specialties:** NumPy, Pandas, Matplotlib, Seaborn, Keras, PyTorch, Tensorflow, Flask, Git, Data Structures, Algorithms, Lets-plot, Sklearn, MATLAB

**Technologies:** Git, Github, Microsoft Office, ReactJS, LaTeX

**Database:** MySQL, SQLPlus

**Recognition:**

Dean’s List 2022-2023, 2023-2024	Math Dept	\$1600
UCI SoCal Data Science \$5000 + Reimbursement	LSAMP/NSF	\$1200 (Fall 2023), \$1200 (Spring 2024)
CICPICUBED \$2000 (2023), \$500 (2024)	ASC-CSUF	\$450