

# Shayan Bathaee

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## Education

### University of California, Santa Cruz

September 2019 – June 2023

- **Major:** B.S. in Computer Engineering (System Programming Concentration)
  - **Minor:** Computer Science
  - **GPA:** 3.93 In-major, 3.94 Cumulative
  - **Extracurricular:** Secretary for UCSC IEEE
  - **Programming Coursework:** Computer System Design, Data Structures & Algorithms, OOP, Embedded Software, Programming for Arts, Assembly Language, Computer Architecture
  - **Engineering Coursework:** Physics I-III, Calculus I-III, Discrete Math, Linear Algebra, Differential Eqs., Probability, Networks, Logic Design, Signals & Systems, Circuit Theory
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## Experience

### Systems Engineering Intern

#### Northrop Grumman

June 2022 – August 2022

- Made revisions to MITRE's CICAT, a Python-based tool used for simulating cyber threats
- Upgraded CICAT to support 400% more threat data while increasing fault tolerance
- Developed Python scripts to iterate through repositories of data and construct large JSON files
- Documented the installation and changes so Cybersecurity teams at Northrop Grumman could efficiently use CICAT
- **Leveraged Knowledge:** Python, Git, Batch, Cybersecurity, Confluence, Excel

### Software Engineering Intern

#### California Code Solutions

March 2022 – June 2022

- Independently developed an adventure game as an Android app for CACS – a startup company providing custom software
- Features the ability to save game progress on the users device with a login page at the homescreen
- **Leveraged Knowledge:** Java, Android Studio, Git, Game Design

### Physics Tutor

#### UCSC Academic Excellence Program

March 2021 – August 2021

- Led my own tutoring sessions for groups of 1-5 students
  - Co-led problem-solving sessions for groups of 20+ students
  - Taught concepts such as optics, waves, fluid dynamics, electricity, and magnetism
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## Software Projects

### Multithreaded HTTP Server: (C)

- Independently built a multithreaded HTTP Server capable of GET, PUT, and APPEND requests
- Added read/write atomicity using a pthread mutex lock
- Tested functionality using Bash scripts to execute thousands of requests at once

### Machine Learning from Scratch: (Python)

- Built a Linear Regression algorithm using Gradient Descent
- Finds the line of best fit for a dataset and animates its progress using Matplotlib

### Image to ASCII: (Python)

- Converts any image into ASCII text art in Python
- Changes resolution, greyscales, and gets the hexadecimal color value for each pixel
- Maps the color value to a character set to determine which character should be displayed

### Battleship on u32 - Embedded Software: (C)

- Co-programmed a battleship game on two u32 boards
- Used UART communication protocols to send checksums over a connection
- Designed multiple finite state machines for the hardware inputs and the game state
- 4000+ lines of code including unit tests

### Six Degrees of Kevin Bacon: (C++)

- Constructed a graph to store actors as nodes and movies as edges
- Used BFS to return the shortest path between any two actors chosen by the user

### Range Queries Using Self Balancing BST: (C++)

- Implemented an AVL tree and inserted every word in the english dictionary
  - Wrote a 1-D range searching algorithm to count the number of words within a range in logarithmic time
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## Technical Skills

- **Proficient:** Python, C, C++
- **Familiar:** Git, Bash, HTML, CSS, JavaScript, Java, MIPS, RISC-V, MATLAB, Android Studio, Pandas, Matplotlib