Vikram Bala

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Education

The University of Pennsylvania, Philadelphia, PA August 2020 – May 2024

- *GPA: 4.0/4.0 | ACT 36/36 | BSE in Computer Engineering | Minor in Mathematics*
- **Relevant Coursework:** Data Structures & Algorithms (A), Computer Architecture (A+), Discrete Math (A), Embedded Systems (A+), Big Data Analytics (A) | *Awards:* IEEE HKN Engineering Honor Society — Top 12.5% of Class of 2024

Professional Experience

Susquehanna International Group (SIG) | Philadelphia, PA June 2022 – August 2022
Software Engineering Intern – TBD

Johns Hopkins Applied Physics Laboratory (APL) | Laurel, MD June 2021 – August 2021
Software Engineering Intern – Force Projection Sector

- Designed and created an anomaly detection & behavior prediction system with C++ & Google Protocol Buffers.
- Integrated the system on a service-oriented architecture with testing in GTest and using MATLAB for test data generation.
- Led onboarding and created extensive documentation for new employees to continue work on my software system.
- Supported front-end visualization of flight data using ReactJS and developing visualization algorithms in TypeScript.

Brainwaive LLC | Huntsville, Alabama September 2020 – March 2021
Software Engineering Intern - Ethar Augmented Reality

- Developed an augmented reality (AR) app content management/delivery system with C#, Unity, and Immersal AR SDK.
- Integrated REST API with app to allow for online AR content, and developed a touch-based object manipulation interface

Penn Electric Racing | Philadelphia, PA | www.pennelectricracing.com January 2021 - Present
Software & Electrical Engineer (We build an electric racecar to compete in the Formula SAE International competition)

- Led embedded software (C++) and electrical design of a battery monitoring PCB employing STM32 microcontrollers.
- Spearheaded onboarding program for 20 rookies with series of interactive presentations, projects, & performance reviews.

Teaching Assistant – CIS120 | Philadelphia, PA September 2021 - Present
Programming Languages and Techniques I

- Led weekly recitations for 20+ students, graded assignments, facilitated code reviews, held weekly office hours.
- Taught concepts such as functional & object-oriented programming in OCaml & Java, GUI programming, and algorithms.

Projects

Jazz Improvisation Bot May 2022 – June 2022
Node.js & JavaScript, Express.js, MongoDB, AWS Lambda & EC2, HTML, CSS, Bootstrap | Website Link | GitHub Repository

- Built a website that allows users to create chord progressions, which a bot can then play novel jazz improvisations over.
- Designed improvisation algorithm in AWS Lambda for scalability, and an accounts system for users to save compositions.

Projectile Locating and Tracking System March 2022 – April 2022
C, C++, Python, OpenCV, AVR Microcontrollers, ESP8266 Microcontroller, JavaScript | GitHub Repository | YouTube Video

- Created a projectile tracking system to locate a moving projectile, point a laser at it, and display location on "radar" LCD.
- Wrote custom UART serial communication, Servo Motor control, and LCD graphics libraries for the ATmega328p MCU.
- Designed a computer vision-based method using a two-camera stereo vision system in OpenCV to locate projectiles.

Connect-4 AI and TCP Multithreaded Login Server December 2020 – January 2021
Java, Java Swing, Java Socket Programming | GitHub Repository

- Created a minimax based Connect-4 AI and multithreaded TCP accounts server for a Java Swing game application.

Modeling FIFA Soccer Players' Value | GitHub Repository December 2021
Python, Python Pandas, Scikit Learn, Seaborn, Matplotlib,

- Scraped/structured data, performed EDA, created a random forest & logistic regression to predict players' market value.

Skills and Interests

Languages: Java, C, C++, C#, Python, JavaScript, OCaml, HTML & CSS, Arduino IDE, LaTeX
Other Skills: AWS, Express.js, Node.js, MongoDB, AVR & STM microcontrollers, Python Flask, Swing, Linux, Git, CMake