Antonio Balanzategui

319 Pheasant Run Ct, Blacksburg, VA, 24060 | 804-332-9563 | antbalanzategui@vt.edu |

www.linkedin.com/in/antbalanzategui | https://github.com/antbalanzategui | https://antoniobalanzategui.vercel.app/

Education

Bachelor of Science, Computer Science | Major GPA: 3.25 | Cumulative GPA: 3.16
Expected Graduation: May 2025

Virginia Tech - Blacksburg, Virginia

Courses: Data Structures & Algorithms, Java OOP, Intro to Problem Solving, Intro to Computer Organization, Introduction to GUI Programming, Applied Combinatorics, Intermediate Software Design, Data Visualization and Analytics, Comparative Languages

Skills/Awards

Programming: Java, Javascript, Python, SQL, C, R/RStudio, Ruby, Pascal, Haskell, Prolog
Web & Database: HTML, CSS, MySQL, React, Express, Mongoose, MongoDB
Technologies: Git, Docker, Postman, Solidworks(3D Modeling), JavaFX/SceneBuilder, Excel, Eclipse, Microsoft Suite
Other: Spanish(Proficient), Marvin L. and Leila W. Pollard Scholarship

Projects

External Quicksort with Buffer Pool Management

- Developed an external sorting algorithm using a modified **Quicksort** and managed **I/O** operations with an **LRU** buffer pool.
- Sorted large **binary** data sets directly on disk, optimizing interactions between **Quicksort** and the buffer pool.
- Implemented a command-line interface for sorting and collecting runtime statistics (cache hits, disk reads/writes, execution time).
- Utilized **Java** for efficient **memory management** and performance optimization.

Isotherm Plotting Program

- Developed a program to calculate densities of substances using four equations of state and plot isotherms.
- Created an interactive UI with sliders for temperature and pressure adjustments, showing density updates via graphically
- Enabled customizable isotherm plotting with settings for the number of isotherms, temperature interval, and start/end pressure.
- Utilized **Python**, **Matplotlib**, **Pandas**, and **NumPy** for data manipulation and visualization, applying object-oriented programming principles.

Google Programming Statistics

- Created a **API** using **Mongoose** and **Express** to fetch data from a **MongoDB Database**
- Fetched data is used to create responsive graphs using **React** and the **JavaScript** library **D3**
- Rendered a **MUI** DataGrid component, which allows for users to select particular data points
- Highlighted data is then displayed on the graph for the user, using **React**

Visual Novel API

- Utilized python to **Web Scrape** and use **APIs** to gather information of visual novel series: “Umineko When They Cry”
- Developed a **API** using **Express** to fetch data from a **MySQL** database, containing information of the series
- Created a query validation system and query handling process that allows for the quick creation of **Middleware** functions
- Provides in depth error messages to the user dependent on each **routes’** query schema

Clubs and Organizations

Galileo/Hypatia Living Learning Community (Virginia Tech) (2021 – 2022)

- Engaged in community service, networking activities with other engineering students, and upheld professionalism.

Society of Hispanic Professional Engineers (Virginia Tech) (2022 – Present)

- Actively involved within the community of underrepresented groups of engineers on campus
- Assisted in guiding discourse towards professionalism and the promotion of racial equity on campus.