RYAN BATUBARA

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EDUCATION

University of California, San Diego
La Jolla, CA

Mathematics-Computer Science, Data Science Double Major   *Sep. 2022 – June 2026*

- Coursework: Machine Learning, Recommender Systems, Databases, Linear Algebra, Data Structures, Optimization, Algorithms, Graph Theory, Abstract Algebra, Analysis, Statistics, Quantum Computing

EXPERIENCE

Mathematics Undergraduate Researcher
January 2024 – Present

https://github.com/UCSD-computational-number-theory/GPUFiniteFieldMatrices.jl   *San Diego, CA*

- Optimized Artin-Mazur height, toric controlled reduction runtimes by 50x using Julia and CUDA on the GPU.
- Developed multiple open-source Julia packages for fast GPU linear algebra beating FLINT using CUDA.

Software Engineering Intern
September 2025 – Present

Merah Putih Ltd.   *Jakarta, Indonesia (Remote)*

- Created web dashboard from scratch for 20 management systems with React, Tailwind, TypeScript, and Leaflet.
- Tested and deployed 10 websites for performance and mobile compatibility using AWS, Vitest, Playwright.

Data Science Undergraduate Researcher
September 2024 – June 2025

https://datadiv.wordpress.com/about-us/   *San Diego, CA*

- Worked with Smarr Lab and formerly incarcerated people to explore data on incarceration vs. social policies.
- Gathered GBs of data from US government to visualize and analyse incarceration trends using Python and SQL.

AI Research Intern
July 2025 – September 2025

https://gani.ai   *Jakarta, Indonesia (Remote)*

- Reduced model costs 10x by implementing in-house LLM pipeline with LangChain and AWS SageMaker.
- Finetuned large language models for legal and due diligence generation using RAG, QLoRA, and Unsloth.

CSE PACE Mentor
Sept 2023 – Present

https://pace.ucsd.edu/   *San Diego, CA*

- Onboarded 100s of first-year CS students weekly on cutting-edge CS topics and academic resources.
- Worked alongside educational researchers on novel pedagogy for incoming CS students, such as this paper.

PROJECTS

AirBnB Listing Success Predictor | *Python, Pandas, TensorFlow* | https://rybplayer.github.io/AirBnB-Predictor/
- Created website with 10s of visuals using Plotly to communicate the key features of successful AirBnB listings.
- Used TensorFlow, SciKit-Learn to implement RNN, CNN machine learning to predict review scores at 0.17 MAE.

Step Counting Algorithm Visualization | *Javascript, D3.js* | https://rybplayer.github.io/StepCounterVisualization/
- Made website with 10s of visuals using D3.js and Javascript to interactively visualize step counting algorithms.
- Used Python to process 100 hours of accelerometer data to evaluate various step counting algorithms.

UCSD Class Scraper and Plotter | *Python, Rust, Javascript* | https://github.com/UCSD-Historical-Enrollment-Data/
- Scraped and plotted 40000 UCSD classes/hour in parallel with Rust, Javascript, Python on Digital Ocean.
- Condensed 100GBs of scraped data into meaningful matplotlib plots for over 10,000 UCSD students.

TECHNICAL SKILLS

Data Science: ScikitLearn, PyTorch, TensorFlow, AWS SageMaker, Pandas, Numpy, D3.js, Plotly, Matplotlib, Seaborn
Developer Tools: Git, Docker, Kubernetes, Digital Ocean, Github, Tmux, Jupyter, Swagger, Postman, Bun, Vitest
Frameworks and Libraries: React, Next.js, Qiskit, Oscar, Flint, Selenium, CUBLAS, Unsloth, LangChain, CUDA, Vite
Hobbies: Classical Guitar, Puzzles, PC Building, Video Games
Languages: Python, Julia, SQL, Javascript, Typescript, C, C++, ARM, Java, R, Rust, MATLAB, LaTeX, Bash, Powershell

ACHIEVEMENTS

SDSU Big Data Hackaton Best Geospatial Thinker, 2024	https://bigdataforsandiego.github.io/
World Mathematics Invitational Bronze, *Fukuoka, Japan*, 2019	https://www.wminv.org/Subpage/Winners_2019.aspx
World Mathematics Invitational Bronze, *Seoul, Korea*, 2018	https://www.wminv.org/Subpage/Winners_2018.aspx