Eugene Bertrand

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Education

University of California, Santa Cruz **Expected Graduation: June 2027**
Bachelor of Science in Computer Engineering
- GPA: **3.98, Dean's Honor List**
- Relevant Coursework: Computer Architecture, Computer Systems, Data Structures and Algorithms

Technical Skills

Programming Languages: Python, SQL, Java, Javascript, Rust, CSS, HTML, C, C++, Assembly, R
Tools & Frameworks: Node.js, React, Express, Pandas, PyTorch, Kubernetes, Docker, SWI-Prolog, Typescript
AI/ML: ChatGPT, NVIDIA BioNemo, Megatron GPT, Neural Networks, TensorFlow
Other: Git, Github, Datalog

Experience

Edge Computing Researcher April 2025 - Present
Baskin Engineering at UC Santa Cruz; Led by Professor Abel Souza
- Conducting research on intelligent, power-aware user-space scheduling for edge servers, focused on improving energy efficiency without compromising performance.
- Developed tools utilizing **Python** to detect real-time CPU utilization shifts by analyzing workload patterns and slope-based behavior changes.
- Simulated diverse computational workloads—including variable-scale matrix multiplication—using Python's **Multiprocessing** framework.
- Forecasted CPU demand and communicated results through a shared interface to enable dynamic, load-aware scheduling decisions.
- Achieved up to **2.3× speedup** in workload throughput and **18% reduction in power usage** under high-utilization scenarios through adaptive scheduling techniques

AI/ML Researcher Oct 2024 - Mar 2025
AIEA Lab at UC Santa Cruz; led by Professor Leilani Gilpin
- Conducted comprehensive evaluations of AI models, identifying **15–20% accuracy gaps** across benchmarks and proposing improvements to inference consistency and generalization
- Leveraged advanced tools, including **SWI-Prolog** and ChatGPT's AI model, to design and execute complex queries using **Python**.
- Built a custom backward-chaining system for First-Order Logic (FOL), achieving **98% correctness** across a suite of formal test cases
- Explored alternative logic paradigms, including **Datalog**, **Linear Temporal Logic (LTL)** and **Deontic Logic** and created educational materials.

Full-Stack Developer Aug 2023 - Dec 2024
TAJO LLC; Sacramento, CA
- Engineered the company's web infrastructure and branding assets, optimizing UI/UX to align with stakeholder requirements.
- Integrated visually adaptive elements using **HTML**, **CSS** and **JavaScript** to enhance content engagement.
- Implemented secure and efficient donation and subscription service embeds.
- Refined frontend components to elevate the company's digital presence.

Projects

GitViewer | *JavaScript (Node.js, React), GitHub REST API* April 2025 - May 2025
- Developed a full-stack web application to retrieve and display GitHub user profile data based on username input.
- Built a **Node.js** and **Express** backend to handle API routing and connect with the **GitHub REST API**.
- Designed a responsive React frontend with dynamic input handling and real-time data rendering.

Serene AI | *Python, NVIDIA Bionemo, Pandas, PubChem* Nov 2024 - Jan 2025
- Developed an AI model using **NVIDIA BioNemo** to predict the efficacy of chemical compounds (based on molecular features) to treat neurological illnesses.
- Utilized **RDKit** for chemical structure handling and visualization of compounds from SMILES representations.
- Employed **PyTorch** for tensor operations and model evaluation to assess compound efficacy.
- Integrated **Pandas** for data preparation and manipulation to facilitate prediction analytics.
- Predicted compound efficacy and provided confidence scores based on molecular features.