Vishva Arasan

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EDUCATION

University of California Santa Barbara — Santa Barbara, CA
Bachelor of Science in Computer Science — *Sep 2024 – June 2027*

TECHNICAL SKILLS

Languages: Python, Java, C/C++, SQL, HTML/CSS
Frameworks: Django, Django REST Framework, Flask, Node.js
Tools & Testing: KLEE, DeepSeek V3.2, Git, Postman, PostgreSQL, SQLite, Vim, VS Code, AWS Cloud Practitioner
Core Concepts: Symbolic Execution, Fuzzing, Static Analysis, REST APIs, ORM

RESEARCH EXPERIENCE

Undergraduate Research Assistant — Jan 2026 – Present
UCSB Verification Lab (Advisor: Prof. Bultan) — *Santa Barbara, CA*

- Developing an automated pipeline using **DeepSeek V3.2** to generate C drivers for **KLEE**, automating **symbolic execution** for vulnerability detection.
- Implementing **guided reasoning agents** to detect error hotspots via **static analysis** and generate instrumented files with automated assert statements.
- Engineered a data abstraction layer converting C structures into **JSON representations** to facilitate **LLM reasoning** over program state.
- Evaluating detection **precision and recall** against the **Juliet test suite** to benchmark performance against the STASE tool.

PROJECTS

Bloom Filter Performance Analysis | *Python, Matplotlib, Data Structures* — Nov 2025

- Developed a **Bloom Filter** from scratch to analyze the trade-off between memory footprint and **False Positive Rates** using **NumPy**.
- Engineered two hashing strategies: a **polynomial rolling hash** and a seeded random generator, identifying uniformity failures in hashing logic.
- Validated experimental results against theoretical models, confirming optimal **hash count (k)** for varying capacity factors.

Global Countries Management API | *Python, Django, REST Framework* — Dec 2025

- Developed a **RESTful API** implementing full **CRUD operations** and custom search logic via **Django QuerySets**.
- Standardized **JSON error handling** and data integrity through **ModelSerializers** and input validation logic.

Task Management API | *Python, Flask, SQLAlchemy* — Jan 2026

- Built a backend service using **Flask** and **SQLite**, utilizing **SQLAlchemy ORM** for normalized database schema management.
- Performed comprehensive endpoint testing via **Postman** to ensure compliance with **stateless REST** architectural standards.

PROFESSIONAL EXPERIENCE

Computer Science Intern — April 2023 – July 2023
CUBUS Solutions Inc. (Merged with Tyfone) — *Livermore, CA*

- Supported the development of digital banking services using **SQL databases** and **JavaScript APIs**.

High School Coding Tutor — Aug 2023 – June 2024
Granada High School — *Livermore, CA*

- Mentored students in **Python and Java**, debugging algorithmic issues and explaining AP Computer Science concepts.