Ayush Sinha

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Education

University of Waterloo — Waterloo, ON
Master of Engineering in Computer Engineering — *Sep. 2023 – Dec 2024*

Kalinga Institute of Industrial Technology (KIIT) — Bhubaneshwar, IND
Bachelor of Technology in Electrical Engineering — *Aug. 2019 – Jun 2023*

Experience

Electrical Intern — May 2022 – June 2022
Automation Network and Services Pvt Ltd — *IND*

- Verified control system connections for 10+ industrial machines pre-delivery, reducing client-side deployment issues by 25%.
- Accelerated testing cycles by 30% by troubleshooting from circuit diagrams and optimizing testing workflows.
- Improved machine output quality by identifying and resolving hardware faults during live testing, lowering error rates by 20%.

Projects

Student Housing Booking Website | *Angular, Node.js, Elysia.js, Bun, Docker, Postgresql*

- Increased search efficiency by 25% by developing dynamic property filters for location, price, and room specifications using Angular.
- Reduced local server startup time by 60% by integrating Bun for fast runtime and containerizing the backend with Docker.
- Improved code reliability by 100% through writing 144+ automated tests (68 frontend, 76 backend), ensuring robust functionality.

Traffic Intersection Surveillance | *Python, C++, Graph Theory, Algorithms*

- Enhanced system efficiency for law enforcement by engineering an optimization tool to compute minimal camera placement across high-traffic intersections.
- Reduced hardware requirements by 40% by implementing a graph-based solution to the Vertex Cover problem using advanced algorithmic techniques.
- Increased monitoring coverage accuracy by designing and deploying a robust algorithm ensuring full surveillance with minimal overlap.

Extended Wlang with Formal Function Support | *Python,Tatsu*

- Enhanced symbolic execution by adding function definitions with `requires`/`ensures` clauses, improving testability and modularity of programs.
- Achieved 100% statement and branch coverage by updating parser, AST, and execution engine, increasing reliability and maintainability of the codebase.
- Reduced runtime assertion failures by validating pre/postconditions symbolically, aligning with formal verification practices from Dafny.

Technical Skills

Languages: Python, C++, SQL (Postgres), JavaScript, HTML, CSS, Typescript
Frameworks: Angular, React, Node.js, Material-UI, FastAPI, Elysia.js, Bun
Developer Tools: Git, Docker, VS Code, Visual Studio, NPM, Jupyter Notebook, Anaconda, AWS, Linux
Libraries: pandas, NumPy, Matplotlib, TensorFlow, PyTorch, Scikit-Learn
Cloud & OS: AWS, Linux

Certifications & Courses

Ultimate AWS Certified Cloud Practitioner (CLF-C02) (Ongoing) — *Udemy*
The Complete Python Bootcamp – From Zero to Hero in Python — *Udemy*
Full-Stack Web Development Bootcamp — *Udemy*