# KUMAR VARENYA

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ORCiD | Linkedin | Github

## EDUCATION

**University of British Columbia**  Vancouver, BC
*Bachelor of Applied Science in Computer Engineering and Honours Mathematics*  *2021 – 2026*

## EXPERIENCE

**Amazon**  Vancouver, BC
*Software Development Engineer Intern (AWS)*  *May 2024 – Dec 2024*
- Built AI software package using Docker, Kubernetes, and AWS (CDK, Fargate, Bedrock), improving efficiency by 50%.
- Designed secure LLM prompt templates and PII detection, cutting errors by 70% with zero breaches.
- Implemented unit and integration tests (100% pass rate); contributed to key feature deployment for Prime Day.

**University of British Columbia, Department of Computer Science**  Vancouver, BC
*Teaching Assistant (CPSC 110, CPSC 121)*  *January 2023 – April 2024*
- Led weekly tutorials for 2000+ students, improving understanding of functional programming and discrete math.
- Graded over 500 assignments and exams per week and provided constructive feedback to improve student performance.
- Collaborated with course instructors to update course materials, aligning content with current programming practices.

**UBC Uncrewed Aircraft Systems**  Vancouver, BC
*Payload Mechanical Designer*  *September 2022 – April 2024*
- Engineered modular payload mounting systems for autonomous drones, optimizing weight distribution and assembly.
- Conducted stress analysis and wind tunnel testing to validate design performance under simulated flight conditions.
- Worked with electrical engineers to integrate sensor packages, improving real-time data acquisition during test flights.

**Population Data BC**  Vancouver, BC
*Software Programmer (Work Learn)*  *September 2022 – April 2023*
- Built Python and SQL ETL pipelines to boost data throughput and reduce latency for large epidemiological datasets.
- Developed containerized microservices with API gateways to enable secure, compliant data access.
- Refactored legacy code using design patterns and optimizations to improve scalability and maintainability.

**Oil and Natural Gas Corporation**  New Delhi, IN
*Summer Intern*  *Summer 2022, 2023*
- Analyzed pipeline monitoring data to identify potential failures, reducing unplanned maintenance incidents by 20%.
- Supported the implementation of GIS mapping tools for resource allocation and logistics planning.
- Assisted in designing database systems to track over 1,000 equipment inspections and maintenance schedules.

## RESEARCH EXPERIENCE

**Carnegie Mellon University**  Pittsburgh, PA
*Undergraduate Research Assistant*  *May 2025 – Present*
- Investigating compositional verification techniques for concurrent software systems to enhance modular analysis.
- Applied static analysis to identify data races and synchronization bugs in multithreaded C/C++ programs.

**UBC Pacific Laboratory of Artificial Intelligence**  Vancouver, BC
*Data Engineering Research Assistant*  *Sep. 2023 – Apr. 2024*
- Collected, curated, and annotated Minecraft gameplay datasets to support behavioral and AI-driven analysis.
- Built preprocessing pipelines to structure spatial-temporal data for downstream machine learning tasks.

**Tokyo Institute of Technology**  Tokyo, JP
*Indian Delegate, Sakura Science Plan (Collaborative Research Activities Course)*  *2020*
- Led an 8-member team to develop a fiducial-marker-based localization model for an unstable camera feed.
- Optimized real-time performance in V-rep, achieving calibration error $\leq 0.5\%$.

**Toyohashi University of Technology**  Aichi, JP
*Indian Delegate, Sakura Science Plan (Collaborative Research Activities Course)*  *2020*
- Directed development of a multi-tasking autonomous robot, integrating sensors and actuators for real-time control.
- Enhanced navigation by optimizing A* and Dijkstra algorithms, reducing execution time by 22%.

## TECHNICAL SKILLS

**Languages**: Java, C/C++, Python, R, SQL, HTML/CSS, MATLAB, Lua, ARM Assembly, Verilog
**Frameworks**: Git, JUnit, Swing, JavaFX, Jupyter, NumPy, TensorFlow
**Tools**: Valgrind, Bash & Shell, Altium Designer, Arduino, Raspberry Pi, Solidworks