

Krupal Shah

780-716-8607 | krupalshah74@gmail.com | linkedin.com/in/krupalshah74 | github.com/Krupal-Shah

EDUCATION

University of Alberta

Bachelor of Science in Computing Science Honors in AI

Edmonton, AB

Expected Graduation **May 2027**

- **GPA:** 3.8 / 4.0
- **Relevant Coursework:** Database Management System, Algorithms, Machine Learning 1 & 2, Ethics in Data Science & AI, Introduction to AI
- **Scholarships:** A University of Alberta Undergraduate Scholarship (International)

WORK EXPERIENCE

Research Assistant

Sep. 2024 - Sep. 2025

University of Alberta

Edmonton, AB

- Spearheaded the development of a Python-based simulator using **Open3D** to simulate accident-prone scenarios occurring due to the A-Pillar of a vehicle.
- Optimized and **automated** the simulation pipeline to execute over **5000 simulations in parallel**, reducing execution time by more than **10 days**.
- Explored real-time rendering concepts and integrated **3D math fundamentals** such as coordinate transforms, ray tracing, rotations matrices etc.
- Developed a **graph neural network model** to predict traffic volumes of the city using spatial relationships and limited data.
- Built and trained **time series forecasting models** to predict traffic volumes and sensor readings using historical trends and spatial-temporal features.
- Optimized existing **semantic segmentation models** to improved classification of roadway features such as lanes, solid lines, shoulder etc. from LiDAR data.
- Worked in-depth with Hesai LiDAR, IMUs, and cameras, integrating and utilizing their vendor-provided SDKs, to design and develop a single, stable Qt application capable of handling and recording all data streams.
- Designed and 3D-printed custom CAD enclosures for LiDAR and companion sensors, creating a modular unit which is high-speed-stable and easily detachable roof mount.
- Collaborated with a multidisciplinary team to apply transportation engineering insights with technology, contributing to a successful **peer-reviewed conference publication**.

Teaching Assistant

Sep. 2025 - Present

University of Alberta

Edmonton, AB

- Supported instructors for two courses - Formal Systems and Introduction to Artificial Intelligence - by assisting with assignment grading, seminars, and lab sessions.
- Led seminar and lab sessions, teaching core concepts, guiding problem-solving, and addressing student questions.
- Evaluated weekly quizzes and final exams, providing timely, constructive feedback to support student learning.

EXTRA-CURRICULAR LEADERSHIP EXPERIENCE

Software Developer

Sep. 2025 – Present

University of Alberta Formula 1

Edmonton, AB

- Developing an **autonomous vehicle** capable of completing tracks using Pure Pursuit trajectory planning, LiDAR, and camera-based perception algorithms.
- Designed and integrated a modular ROS2-based autonomy stack, interfacing multiple third-party SDKs and custom algorithms while maintaining clean, decoupled node architectures.
- Developed a cloud-based data pipeline to transmit vehicle telemetry to the ground station via AWS, enabling real-time visualization and long-term storage with performance statistics.
- Collaborated in a cross-functional team using Git for version control, managing branches, issues, and pull requests to streamline development.

Software - Deputy Team Lead

Oct. 2023 – Sep. 2025

STARR (Student Team for Alberta Rocketry Research)

Edmonton, AB

- Built an app in QT using C++ Object Oriented Paradigm to track the rocket, collect, parse and store the data
- Integrated real-time **camera streaming** into the ground station software, enabling live video feed monitoring from the rocket during flight simulations and testing.
- Followed the Software Development Life Cycle (SDLC) and AGILE practices, setting milestones, version control, **units test** and maintaining quality standards.
- Facilitated productive discussions and decision-making processes during club meetings, ensuring all members had the opportunity to contribute ideas and provide feedback.

TECHNICAL PROJECTS

Event Lottery System Application <i>Java, Firebase</i>	Oct. 2025 – Present
<ul style="list-style-type: none">Developed a mobile application for fair event registration using a lottery-based system, enabling entrants to join waiting lists via QR code and organizers to randomly select attendees.Applied software engineering concepts including object-oriented design, UML modeling, and modular architecture to ensure extensibility and maintainability.Collaborated with a team using Git for version control, tracking changes, managing issues, and reviewing pull requests to streamline development.	
VISARM - Color Sorter <i>Python, AutoCAD Fusion</i>	Oct. 2025 – Present
<ul style="list-style-type: none">Engineered a complete 4-DOF robotic pick-and-place system, implementing inverse/forward kinematics, workspace calibration, and vision-based control entirely from scratch.Built a calibrated color-sorting pipeline using OpenCV, including lens-distortion correction, checkerboard-based frame mapping, object detection, and robot-frame coordinate transformation.Developed real-time motion planning and closed-loop trajectory execution in Python, integrating grasp verification and error-analysis routines for reliable autonomous manipulation.	
MixMe - AI SaaS <i>LLMs, MySQL</i>	Jul. 2024 – Aug. 2024
<ul style="list-style-type: none">Developed an AI-SaaS application using Next.js by integrating advanced AI models such as Cohere.AI and Replicate AI to deliver intelligent services to users.Integrated fine-tuned model endpoints and prompt engineering techniques to enhance response relevance and personalization across user queries.Built subscription capabilities, allowing users to upgrade to pro subscription plans and implemented API usage limits for free usage.	
Dynamic Wallpapers <i>PyQT, Bash</i>	Sep. 2024 – Oct. 2024
<ul style="list-style-type: none">Developed a PyQT application to refresh wallpapers daily and display information on a system-tray window.Implemented error handling and logging mechanisms to improve script reliability, achieving a 100% uptime in scheduled tasks.Reduced download time by 30% using efficient HTTP requests and multi-threading techniques.Delivered a user-friendly solution by integrating customizable configuration options such as automatically loading it on startup.	

CERTIFICATIONS

Deep Learning Specialization <i>Coursera, Deep Learning - Andrew Ng</i>	May 2024 – Jul. 2024
<ul style="list-style-type: none">Learned the foundation of neural network architectures such as CNN, RNN, LSTMS.Applied these skills on real world cases such as speech recognition, music synthesis, chatbots, machine translation, natural language processing, and moreLearned various optimization techniques to fine tune a model / neural network.	

TECHNICAL SKILLS

Languages: C++, Python, JavaScript, Java, SQL, Bash, RISC-V, ROS2

Libraries/Frameworks: Tensorflow, PyTorch, Flask, Qt6, PyQt, Numpy, Pandas

Tech: AutoCAD Fusion, VS Code, Docker, Linux, MySQL, MongoDB, Figma, Git, Android Studio, Firebase