

Hardik Gupta

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EDUCATION	University of Minnesota, Twin Cities <i>Master of Science (M.Sc.) in Robotics</i>	Sept 2023 - May 2025
	Birla Institute of Technology and Science, Pilani <i>Bachelor of Engineering (B.E.) in Mechanical Engineering</i> <i>Master of Science (M.Sc.) in Biological Sciences</i>	Aug 2018 - Jun 2023
SKILLS	Languages Python, C++, Java, C, JavaScript, R, HTML, CSS, MATLAB Databases MySQL, MongoDB Libraries and Frameworks TensorFlow, Keras, Scikit-learn, Tableau, OpenCV, ReactJS, Express.js, Node.js, Django, Flask Others Git, Amazon Web Services, GitHub, Bash Scripting, CUDA, Metal, \LaTeX	
EXPERIENCE	Graduate Research Assistant, University of Minnesota, Twin Cities Large Language Models, Mathematical Modeling, Generative Pre-Trained Transformer <ul style="list-style-type: none">Collaborated on the development of a mathematical model to analyze consumer decision-making under uncertainty using Bayesian inference and LLMs for optimal product attribute evaluation and utility maximization.Conducted in-depth research on Transformer architecture, including tokenization processes and the implementation of attention mechanisms, to enhance our understanding of Generative AI's impact on consumer information acquisition.	June 2024 - Present
	Financial Analyst Intern, Union Bank of Switzerland Python, Pandas, Numpy, Beautiful Soup, Excel Macros, VBA <ul style="list-style-type: none">Automated the analysis of Pension IPV, streamlining the preparation of CPV graphs for clients, which increased efficiency and reduced analysis time by 40%.Utilized Python libraries, along with UBS reporting tools, Totem, and Bloomberg, to analyze and report on key financial figures, improving data analysis.Assisted in a training sessions on automation in Finance for 18 team members, contributing to discussions on the use of python and Power BI in finance.	Feb 2023 - Jun 2023
SELECTED PROJECTS	RentFree, Short-term Property Listing and Management Web Application React, Node.js, Express, MongoDB, AWS S3, Tailwind CSS Live Project <ul style="list-style-type: none">Developed a full-stack web application enabling users to list, search, and manage rental properties, integrating property-listing and booking features for seamless user experience.Implemented secure user authentication and authorization with real-time updates on property availability and inquiries, ensuring data integrity and user trust.Designed and deployed a profile management system with a responsive interface, adapting to various screen sizes and enhancing user accessibility and experience.	Jun 2024
	Apple Detection and Counting in Orchards Python, YOLOv8, 3D Reconstruction, Filtering <ul style="list-style-type: none">Implemented a robust apple detection pipeline using YOLOv8, achieving detection with 85.2% accuracy.Developed a 3D reconstruction pipeline using COLMAP to create detailed point clouds from overlapping 2D images and applied DBSCAN for clustering detected apple points in 3D space, improving the precision.Utilized RANSAC for ground and tree trunk plane detection to filter out irrelevant apples, ensuring accurate yield estimation to increase by 16%.	Dec 2023
	Optimised Trajectory and Collision Avoidance using Nonlinear Model Predictive Control Python, Non-Linear Control and Optimization, Path Planning <ul style="list-style-type: none">Programmed the Nonlinear Model Predictive Control of the single robotic system for collision avoidance in a dynamic obstacle environment.Simulated the problem of MAV reactive collision avoidance by employing a model-based controller and scaled the system to a two-robot system	Dec 2022
PUBLISHED WORK	The Phylogenetic Study of the CRISPR-Cas System in Enterobacteriaceae Clustering Algorithms, BLAST, Data Analysis PMID: 37118221 Systematically investigate the evolutionary framework of the CRISPR-Cas system in six <i>Enterobacteriaceae</i> species and its evolutionary association with housekeeping genes as determined by the gyrB phenogram. These results advance our understanding of the dynamics of the CRISPR-Cas system.	Apr 2023