Harshish Singh Bedi
Machine Learning Engineer

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EDUCATION

Rutgers University   New Brunswick, NJ
Master of Science in Computer Science   *December 2025*
Mumbai University   Mumbai, India
Bachelor of Engineering in Information Technology (GPA 8.23 – Distinction)   *May 2023*

TECHNICAL SKILLS

Languages: Python, R, C++, C, SQL, Flux (JS-based)
Frameworks: PyTorch, Tensorflow/Keras, OpenCV, YOLO, NumPy, Pandas, Matplotlib, Seaborn, Scikit-learn, SQLite3
Technologies: SQL, NoSQL, Grafana Dashboards, InfluxDB, Git, Vicon Suite (Nexus, Tracker, ProCalc), Hadoop, Apache, Spark
Concepts: Time-series Analysis, AI, ML, Supervised Learning (Regression, Classification, Decision Trees, SVMs), Deep Learning (Neural Networks, CNNs, RNNs, Transformers), Model Evaluation (ROC, AUC, TPR, FPR)

WORK EXPERIENCE

Research Assistant – Graduate Analyst   *October 2024 - Present*
Rutgers Urban and Civic Informatics   New Brunswick, NJ
- Leading the design and implementation of an advanced CNN and ResNet-based system to accurately detect pedestrian and cyclist infrastructure, focusing on features like traffic signage, crosswalks, and lane widths.
- Analyzed movement patterns in the U.S. using 15M+ data points from Veraset, integrating POIs, PlaceKeys, and SafeGraph datasets to uncover actionable insights with detailed analysis.
- Applying state-of-the-art object detection techniques to extract ground, supporting improvements in safety with ~90% accuracy .
- Managing the full project lifecycle, from model development to deployment, ensuring robust data collection and analysis for transportation and civic infrastructure initiatives.

Research Assistant - Developer & Annotation   *May 2024 - Present*
Durandal Lab of Civil and Environmental Engineering   New Brunswick, NJ
- Utilized OpenCV to optimize stereo camera calibration and advised A/B testing for performance improvements.
- Implemented YOLOv11m and YOLOv5m on a dataset of 12,000 aerial traffic images for object detection, achieving 75% accuracy under high-confidence constraints. Developed MATLAB and Python scripts for object detection, pose estimation, and calculating relative rotations and transformations between camera and object coordinates.
- Created CAD models from 3D scanned point clouds of construction vehicles and led 30+ trials using Vicon cameras and software for precise motion capture analysis.
- Annotated and synchronized over 20,000 images from multiple cameras to generate high-quality datasets for research.

Research Assistant – Performance Analyst and Developer   *May 2024 – August 2024*
Rutgers Rail and Transit Program   New Brunswick, NJ
- Utilized time series analysis techniques to predict short term schedules of trains with undocumented schedules with 100% accuracy, enhancing operational efficiency and resource allocation.
- Advanced data filtering algorithms for railway sensor databases, reducing erroneous data by 13.4% and improving train positioning accuracy in GPS-denied environments alongside cleaner analysis.
- Implemented on AWS CodeCommit and deployment frameworks and streamlined CI/CD pipelines, optimizing the development lifecycle and accelerating deployment processes.

PROJECTS

Exploratory Train Analysis
- Identified and resolved key issues with sensor data faults, improving data integrity, resulting in a 15% increase in usable data.
- Produced comprehensive analysis of operational conditions from raw data(~500K data points), demonstrating expertise across multiple domains, including data processing, sensor analytics, and operational efficiency.
- Developed and optimized predictive models to improve train scheduling accuracy and reduce delays, enhancing service reliability.

Space Rescue Mission
- Proposed and optimized a convolutional neural network (CNN) for autonomous navigation in 2D environments.
- Achieved state-of-the-art performance with 99% accuracy in custom and 75% accuracy in generalized scenarios.
- Implemented GPU based multithreading, to shorten the training and simulation time by around 82%.

Lead Price Prediction
- Constructed a logistic regression model for predicting the conversion rate of leads for 'X' Education website, accuracy of 83.93%.
- Conducted extensive data analysis and feature engineering, resulting in a significant improvement in model performance.

ASL Translation Tool
- Generated an advanced ASL translation tool using computer vision and deep learning to provide real-time and accurate interpretation of ASL gestures(~94% accuracy), bridging communication gaps between deaf and spoken language users.