Harshish Singh Bedi

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Education

Rutgers University — New Brunswick, NJ
Master of Science in Computer Science — *Jan 2024 – Jan 2026*

University of Mumbai — Mumbai, India
Bachelor of Engineering in Computer Science — *Apr 2019 – Jun 2023*

Experience

Machine Learning Engineer — October 2024 – Present
Rutgers University - RUCI — *New Brunswick, NJ*

- Quantified transit resilience using NetworkX + GeoPandas identifying high-risk corridors impacting 1.2M+ riders.
- Built an attention network using PostGIS + Python, attributing 2.23M edges to report census block vulnerability.
- Reduced model iteration time by 17% by automating training/inference with configs measured across 30 full runs.
- Submitted manuscript regarding *Climate Hazards and Transit Accessibility* as lead author to Transportation Research Part D (Under Review)

Software Engineer — May 2024 – Jan 2025
Rutgers University - CAIT — *New Brunswick, NJ*

- Designed a Python + OpenCV vision pipeline using Vicon and stereo imaging, cutting 6-DoF pose error by 8% to enable reliable human–equipment safety analysis in construction.
- Increased aerial-asset detection accuracy by 14% by retraining YOLO models on domain-specific data and improving label quality over Amazon SageMaker.
- Slashed annotation time by 94% by automating labeling pipelines and high-throughput data processing.

Research Assistant — May 2024 – Aug 2024
Rutgers Rail & Transit Program — *New York City, NY*

- Produced low-latency inference pipelines by optimizing backend services, achieving sub-200ms arrival predictions.
- Boosted GPS accuracy by 30% using sensor-based anomaly filtering, enhancing real-time tracking reliability
- Reduced deployment friction by 37.9% by implementing CI/CD pipelines in AWS to enable no-downtime releases.

Projects

DocSmart | *Python, LangChain, Vector DBs, LLMs* — Feb 2025

- Developed a RAG-based document intelligence system using 1000-char chunking with 200-char overlap, improving semantic retrieval across multi-document queries.
- Implemented query filtering and routing logic to reduce latency and improve answer relevance.

SigFlow | *Python, NumPy, CUDA, Parquet* — May 2025

- Visioned a NASDAQ ITCH v5 parser handling 10GB+ market data feeds, enabling nanosecond-level order book reconstruction.
- Achieved 45% faster backtesting using vectorized pipelines, Parquet storage, and CUDA GPU acceleration.

RNav | *Math Optimization; GPU acceleration* — May 2024

- Built a 95.7% accurate (75% generalized) CNN for 2D autonomous navigation and cut GPU training + simulation runtime 8.2× through multi-threaded execution.

Utilbelt.io | *JavaScript, Tailwind CSS* — Feb 2026

- Built a comprehensive suite of developer tools including secure PDF splitting/merging and Wi-Fi QR generation, utilizing persistent local storage for state management.
- Designed a responsive, accessible UI with TailwindCSS featuring dynamic interactions and optimized asset delivery via Vite for instant interactivity.

Technical Skills

Languages: Python, C, C++, C, Java, SQL (PostgreSQL), JavaScript, R
Frameworks: PyTorch, TensorFlow, NumPy, Pandas, CUDA, Scikit-learn, React, Tailwind CSS
Database/System: FastAPI, gRPC, PostgreSQL, Docker, Kubernetes, REST APIs
Developer Tools: AWS, GCP, Git, CI/CD, Linux, OpenCV, Jupyter