ARYAN ISHAN RAVESHIA

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Education

Northeastern University **Sep. 2025 – May 2027**
Master of Science in Computer Science *Boston, MA*
- **Relevant Coursework:** Programming Design Paradigms, Web Development, Algorithms, Foundations of AI **GPA: 4.0/4.0**

Manipal Institute of Technology **Oct. 2020 – Jul. 2024**
Bachelor of Technology in Computer and Communication Engineering *Manipal, India*
- **Relevant Coursework:** Data Structures and Algorithms, Database Systems, Operating Systems, Machine Learning, Data Mining, Cloud Computing, Neural Networks, Computer Networks, Software Engineering, Big Data Analytics.

Work Experience

The Boeing Company **Aug. 2024 – Aug. 2025**
Entry Level Software Engineer *Bangalore, India*
- Architected a **Python** and **Neo4j** Data-Fetch service **(Cypher)** to pull airline and airport data, conditionally fall back to OAG, and convert outputs into .ACF schedules for the Simulation Management Service; produced schedules of up to approx **1,000** flights in under **2 minutes** for downstream ingestion.
- Engineered a high-performance aircraft-state streaming using **ZeroMQ** by developing Python publisher/receiver, **Cythonized** and compiled to .pyd modules to reduce overhead; achieved approx under **20ms** end-to-end latency and sustained over **5,000 messages/sec** in test harnesses to support real-time conflict detection.
- Developed a reusable Python flight-path module that decodes aggregated route datasets (routes.rts, routes.json, waypoints.wpt, airport.apt), supports city–city and waypoint–airport queries, and returns route strings plus structured waypoint files — handled a dataset of approx **200k routes** and returned queries in under **500ms** on average.
- Implemented waypoint ETL via Python module to fetch and normalize approx **50k waypoints** from Neo4j, convert decimal co-ordinates to cardinal format, and publish standardized waypoint datasets for modular simulation components.
- Designed serialization and inter-service contracts for microservice migration: prototyped **Protocol Buffers (Protobuf)** for TAAM aircraft payloads to support **FMI 3.0 migration** and defined **ZeroMQ** streaming message schemas; reduced serialized payload size by **40%** vs. JSON and standardized interfaces for microservice decomposition.
- Automated packaging of Windows runtime dependencies in Linux containers using **CrossOver**: created a bottle-install/archive/deploy workflow for VC++ redistributables and other runtimes, enabling headless container deployment and cutting manual VM-based packaging effort by approx **90%**.

Manipal Institute of Technology **Jan. 2024 – Jul. 2024**
Undergraduate Artificial Intelligence Research Assistant *Manipal, India*
- Authored thesis titled "Evaluating Explainable Artificial Intelligence in Regression Models": Designed and constructed interpretable machine learning models, improving explanation fidelity by approx **15%** on benchmark datasets.
- Engineered Explainable AI visualization pipelines using **Python, SHAP, and LIME** to extract and display model decision factors.
- Evaluated model transparency through quantitative metrics (e.g., stability, feature attribution consistency) to ensure reliable interpretability.

Projects

Calendar Management System (Java, Swing)
- Architected, designed and built a robust calendar system using **Java** and **Swing**, strictly adhering to the Model-View-Controller **(MVC)** architecture to ensure modularity, scalability, type-safety and separation of concerns.
- Applied advanced design patterns and engineered a flexible controller using the **Command Pattern** to decouple user actions from business logic and integrated the **Builder Pattern** to streamline the creation of complex event objects.
- Implemented a custom AnalyticsHub for Calendar Analytics and utilized Immutable **Data Transfer Objects (DTOs)** with defensive deep-copying to ensure **MVC and SOLID principles-safe** data transport and strict encapsulation between layers.
- Developed complex algorithms for recurring event scheduling and conflict detection, optimizing for **performance** to handle dense calendar data efficiently.

Learning Management System (TypeScript, React, Node.js, MongoDB, Express)
- Developed and deployed a scalable learning management system with **role-based access control (RBAC)** supporting students, faculty, and administrators, implementing **RESTful APIs** with **Express.js** and **MongoDB** for persistent data storage with optimized queries using **Mongoose** ODM
- Built responsive **React** frontend with **Next.js** and **TypeScript** featuring real-time course enrollment, dynamic user management with **CRUD** operations, modular assignment tracking, and session-based authentication with secure cookie handling, deployed on **Vercel** and hosted on **Render**.

Technical Skills

Languages: Java, Python, C++, TypeScript, JavaScript, SQL, C#
Frameworks and Libraries: ZeroMQ, REST APIs, gRPC, Protobuf, CMake, React, Angular, Swing, ExpressJS, NodeJS
Machine Learning: SHAP, LIME, Scikit-learn, NumPy, Pandas, TensorFlow, XGBoost, Random Forests, Decision Trees, Regression Models, Feature Engineering, Model Evaluation and Explainability
Databases: MySQL, MongoDB, SQLite
Tools & Cloud: Git, Docker, GitLab CI/CD, Jira, Postman, Vercel, Render, VS Code, IntelliJ, Eclipse