

# ARYAN ISHAN RAVESHIA

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## Education

### Northeastern University

*Master of Science in Computer Science*

Sep. 2025 – May 2027

*Boston, MA*

- **Relevant Coursework:** Programming Design Paradigms, Web Development, Algorithms, Foundations of AI

### Manipal Institute of Technology

*Bachelor of Technology in Computer and Communication Engineering*

Oct. 2020 – Jul. 2024

*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

*Entry Level Software Engineer*

Aug. 2024 – Aug. 2025

*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.apr), 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

*Undergraduate Artificial Intelligence Research Assistant*

Jan. 2024 – Jul. 2024

*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) - [Link](#)

- 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