

# RUSHI RAVAL

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## OBJECTIVE

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MEng. Graduate from the University of Waterloo with a strong foundation in Software Development, Artificial Intelligence, and Machine Learning. A solutions-driven problem solver skilled in Java, Python, SQL, and functional programming paradigms, adept at designing scalable systems and tackling research-driven challenges. Eager to leverage analytical rigor and technical expertise to advance innovative computing and AI solutions.

## EDUCATION

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**Bachelor of Technology in Information Technology**  
Dharmsinh Desai University

December 2020 - May 2023  
*Nadiad, Gujarat*

**Master of Engineering in Computer Engineering**  
University of Waterloo  
Specialization: Artificial Intelligence and Machine Learning.

September 2023 - September 2024  
*Waterloo, ON*

## SKILLS

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<b>Languages:</b>	Java, React.js, C++, JavaScript, PL/SQL, Perl, Shell, bash, HTML/CSS
<b>Tools:</b>	Apache Kafka, Jenkins, Postman, Docker, Power BI, Kubernetes, Git
<b>Databases:</b>	MySQL, SQL Server, Oracle DB, Postgres, MongoDB, Firebase
<b>Frameworks:</b>	Spring Boot, Keras, TensorFlow, PyTorch, REST
<b>Libraries:</b>	JUnit, Retrofit, NumPy, Pandas, Seaborn, XGBoost, Plotly
<b>OS / Networking:</b>	Processes, Threading, Synchronization, TCP/IP, DNS, DHCP, NTP, SMTP, SNMP
<b>AI / ML:</b>	LLM, ETL/ELT, Data Science Life Cycle(Transformation, Modelling, Normalization)
<b>Other:</b>	Redis, CI/CD, 340+ Leetcode DSA Problems Solved ( <a href="#">Link</a> )
<b>Certifications:</b>	AWS Academy ( <a href="#">Link</a> ), GCP Badges ( <a href="#">Link</a> )

## EXPERIENCE

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**Android Java Developer Trainee**, InfoLabz

May 2019 - June 2020

- Developed 5+ Java and Kotlin-based applications, applying OOP principles and implementing MVVM design patterns.
- Built RESTful APIs (Spring Boot) and designed optimal SQLite databases (12+ tables), improving backend efficiency by 25%; additionally developed scalable Spring Boot APIs for a logistics management side project.
- Coordinated with QA teams to ensure consistent app functionality, which involved conducting testing and developing test scripts, achieving a 40% reduction in deployment time and increased unit testing coverage.
- Utilized Notion to track progress across all project phases, documenting reports detailing 16+ requirements, and implementation details.

**Project Intern**, Institute for Plasma Research

December 2022 - March 2023

- Implemented 4 new functionalities following driver code updates in C to optimize performance of embedded devices, collaborated with a team of 3 scientists to integrate the EPICS framework for a LIGO project.
- Deployed EPICS on Docker for LIGO's embedded systems, accelerating IOC testing and reducing deployment time by 30%.
- Leveraged internal database to fetch and monitor process variables via SQL on a dashboard, enabling real-time analysis of 34+ data points.
- Resolved critical integration issues within the EPICS on Linux by identifying and fixing dependency mismatches, ensuring stable IOC configurations, and improving system reliability and cross-departmental communication.

## PROJECTS

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### 3D Data Viewer with GIS Integration – React/Three.js App

December 2024 - January 2025

- Developed a React-based web application using Three.js to visualize 3D point cloud data and integrate GIS maps with interactive features like color-by-altitude mapping, point size adjustment, and metadata display.
- Deployed via Github Pages CI/CD; optimized Three.js rendering (WebGL instancing, 60 FPS for 100K+ points) and synced Leaflet.js GIS maps for real-time visualization.

### Water Quality Monitoring – Network/IoT Project

May 2024 - September 2024

- Engineered a network-based IoT water monitoring system in Proteus, utilizing Arduino microcontrollers programmed in C++ language, integrating sensors for TDS, turbidity, and temperature measurements.
- Implemented TCP connections for real-time data transmission, enhancing water quality monitoring processes and enabling remote access to collected information.

### Twitter User Analytics - Data Science Project

June 2024 - August 2024

- Designed and implemented an ETL pipeline using Apache Airflow and Python to process Twitter data, leveraging DAGs for orchestrating the extraction of tweets, transformation of data, and loading into AWS S3 buckets.
- Utilized Airflow's PythonOperator to execute custom Python functions for data extraction and transformation, enhancing pipeline efficiency and reliability.

### ECG Time Series Classification - ML Project

April 2024 - July 2024

- Developed over 10 neural network models using TensorFlow and PyTorch, achieving a 65% validation accuracy by leveraging ensemble learning, dropout, and early stopping to enhance model performance and prevent overfitting.
- Engineered a comprehensive data preprocessing pipeline that prepared ECG time series data for model input, ensuring high-quality, normalized data, which significantly contributed to the model's classification accuracy.

### Spotify Music Discovery - Database/ML Project

January 2024 - March 2024

- Coded a Streamlit application using Python and the Spotify Web API to create a web interface, enabling users to receive personalized music recommendations through two different models based on their listening habits.
- Modeled Spotify database in MySQL from scratch with over 100,000 songs loaded, and developed a music recommender system for up to 4 users leveraging content-based filtering and cosine similarity techniques.

### Database Restructuring and Query Optimization - Database Project

October 2023 - January 2024

- Engineered a comprehensive data model for the NHL database, implementing efficient table structures and relationships to capture complex game statistics, player information, and team data across multiple seasons.
- Identified execution plans for over 20 complex SQL queries and applied targeted optimizations to main attributes, enhancing query efficiency and ensuring accurate insights extraction.

### Optimal Placement of Security Cameras - C++ Project

September 2023 - November 2023

- Utilized NP-complete Vertex Cover to strategically position cameras for monitoring city traffic, deploying graph algorithms for precise distance calculations.
- Optimized Boolean Satisfiability solver using multithreading to reduce time complexity for larger datasets, achieving a reduction in processing time from  $10^7$  ms to  $10^2$  ms for datasets with over 20 vertices.

### Hybridclass - Java/Android App

May 2022 - December 2022

- Crafted a Java application utilizing REST APIs for data exchange to facilitate 7+ in-class activities such as attendance tracking via QR codes, material sharing through Firestore, and quiz through sessions for professors.
- Designed 20+ visually appealing and user-friendly Android interfaces employing material design techniques and XML Schema to craft intuitive and modern user experiences.