

VISHAL JAYAKUMAR

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TECHNICAL SKILLS

Languages: C++, Python, SQL, Scala, HTML/CSS

Frameworks & Libraries: PyTorch, NumPy, Pandas, Docker, Spark, ROS2

EXPERIENCE

Cloud Database Engine Developer

May 2025 - August 2025

SAP

- Implemented incremental view maintenance algorithms in Scala and Spark for data lakes, enabling self-updating views and efficient data refresh
- Developed custom query optimization rules in Scala using the Spark SQL Catalyst API for subquery and CTE flattening, reducing Logical Plan processing time by 50%

Python Developer

September 2024 - December 2024

Burkett Statistical Consulting

- Used Pandas for data processing of utility meter data, producing a 90% smaller clean dataset
- Engineered features for EV load prediction and fitted numerous machine learning models achieving 80% accuracy
- Automated assembly line scheduling using Google OR-tools, Python and R, reducing manual effort and achieving a potential 5% reduction in production costs while meeting all production constraints
- Created energy arbitrage optimization model in Python, cutting maximum profit computation time by over 99.9%

WiFi Software Test Developer

January 2024 - April 2024

Ford Motor Company

- Implemented and tested Python automation test scripts using the Slash testing framework for in-vehicle WiFi connectivity modules, extending test coverage to new hardware and automating 10% of manual testing

Junior Data Scientist Intern

July 2023 – September 2023

Exponential Exchange

- Scraped price history of over 30 major market indices using Selenium and Python for data analysis
- Used Snowflake and SQL to compute correlations and created an interactive dashboard in Looker

Junior Software Engineer

May 2023 – August 2023

Inwards Inc.

- Upgraded company website using HTML/CSS, JavaScript & PHP, adding pages and improving load times by 50%

Robotics & RL Researcher

October 2023 - Present

Data-driven autonomy research group under supervision of Dr. Mohammad Al-Sharman

- Investigating learned stochastic world models for overcoming sim-to-real gap (targeting EOY publication)
- Co-authored "Autonomous Driving at Unsignalized Intersections: A Review of Decision-Making Challenges and Reinforcement Learning-Based Solutions"
 - * Conducted an in-depth literature review on both classical and deep-learning based (RNN, LSTM, Bi-LSTM with attention, etc.) Driver Intention Inference schemes and synthesized findings
- Contributed to research project into integration of MPC with Reinforcement Learning
 - * Adapted Hybrid Policy Optimization algorithm to use MPC demonstrations to guide reinforcement learning
 - * Wrote custom SAC implementation in PyTorch to get baselines for experimental validation

Autonomy Software Lead

September 2023 – Present

WATonomous - University of Waterloo Autonomous Vehicle Design Team

- Used Docker, CARLA and ROS2 to leverage in-house HPC cluster for high-fidelity AV simulation
- Led team of 10 in development of ROS2 nodes for various world-modeling solutions for autonomy stack

EDUCATION

University of Waterloo

Bachelor of Computer Science, 89.43%, 3.91 GPA

Waterloo, Canada

September 2022 - April 2027