

# Pawan Kishor Patil

Singapore

+65 8670 8366  
pawanpatil663@gmail.com

linkedin.com/in/pawan-kishor-patil  
github.com/PawanPatil19

## WORK EXPERIENCE

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### Backend Software Engineer

June 2025 – Present

Venti Technologies | Python, Java, Clickhouse, RabbitMQ, RESTful APIs, Spark, Kubernetes

Singapore

- Led the design and development of a real-time insights platform for the fleet management system, enabling analytics workflows for proactive failure detection and historical fleet productivity analysis.
- Implemented backend APIs and event-driven services for telemetry ingestion, supporting asynchronous processing of continuous vehicle data and efficient low-latency access through cached query paths.
- Reduced cloud storage read costs by ~40% by architecting a migration to Apache Iceberg-backed Parquet datasets and implementing an Alluxio caching layer to optimize data retrieval.
- Authored architecture design documents and drove technical design discussions with stakeholders, translating product requirements into scalable backend services and data workflows.
- Enabled natural-language analytics for internal teams by integrating Model Context Protocol (MCP) with centralized data schemas, allowing automated generation of agentic SQL queries across the organization's data platform.

### Full Stack Software Engineer Intern

Jan 2024 – May 2025

Venti Technologies | Python, C++, Spark, Typescript, Airflow

Singapore

- Reworked vehicle workflow analysis algorithms and validation processes, improving metric accuracy by ~99% and strengthening the correctness of real-time data processing workflows used by engineering and operations teams.
- Reduced API response times by ~70% and increased release reliability by engineering backend APIs and asynchronous workflows for the simulation platform, including CI/CD automation.
- Performed Vulnerability Assessment and Penetration Testing (VAPT) remediation and security validation for client-facing applications, helping identify vulnerabilities and strengthen application security before deployment.
- Built backend aggregation pipelines and release-readiness dashboards to consolidate development and operational metrics, improving visibility for stakeholders and supporting release go/no-go decisions.

### Undergraduate Research Assistant

May 2023 – Aug 2023

NUS Smart Systems Institute | C++, Python, PostgreSQL, Swagger, Git

Singapore

- Optimized the YOLOv8 object detection pipeline for a VR application by introducing multithreading and training on custom datasets, improving real-time detection performance and inference responsiveness.
- Built low-latency real-time communication pipelines using WebSockets, WebRTC, and Google Protocol Buffers, reducing server-to-VR headset latency by ~60% and improving responsiveness for interactive VR experiences.
- Built gesture-driven and LLM-assisted interaction workflows within the VR application, integrating LangChain-based pipelines to support more natural user interaction.

### Student Assistant

May 2023 – Aug 2023

National University of Singapore | ROS, C++, Flutter

Singapore

- Developed ROS-based control software for a quadruped robot, building application logic to publish movement goals, process velocity commands, and coordinate real-time robot motion through custom control nodes.
- Implemented the communication architecture between the Flutter application, ROS topics, and robotic hardware, enabling low-latency command delivery and telemetry exchange.
- Integrated navigation and safety-control logic, including waypoint handling, joystick inputs, and ultrasonic sensor-based stop mechanisms, to improve reliability during robot operation.

## PROJECTS

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### Backend Performance Study | C++, perf, valgrind

- Built a microbenchmark suite to study how cache locality, false sharing, and lock contention affect service latency and throughput under concurrency, and to analyze root causes of latency spikes in a storage data plane.
- Used profiling tools to measure CPU time, cache behavior, and thread contention, applying optimizations such as improving data locality, cache-line padding and memory alignment.

### Game Mechanics Engine | Swift, Figma

- Collaborated in a team of four to design and build an iOS-style game application from scratch, applying software engineering principles such as object-oriented design, modular architecture, and maintainable code structure throughout the development lifecycle.
- Designed and implemented a reward-based lottery algorithm to drive in-game reward distribution, ensuring clear game logic, extensibility for future tuning, and a balanced player experience.
- Built an event bus system to coordinate in-game audio and visual mechanics, enabling decoupled communication between components and improving the responsiveness and maintainability of interactive game events.

## EDUCATION

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### Bachelor of Computing in Computer Science

National University of Singapore

Aug. 2021 – May 2025

Singapore

## TECHNICAL SKILLS

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**Languages:** Python, C++, Java, TypeScript

**Data & Infrastructure:** PostgreSQL, ClickHouse, Redis, Kafka, RabbitMQ, Alluxio, Apache Iceberg, Airflow, Docker, Kubernetes, Linux

**Tools / Frameworks:** Next.js, REST APIs, Git, MCP tool orchestration