Rutuj Kankaria

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Professional Summary

Backend systems engineer building real-time, event driven systems with deterministic state management and production deployment experience across trading, mobile, and API platforms.

Experience

Research Assistant (Intern) | Pennsylvania State University
Oct 2024 – Present

– Developed constraint-based workflows for adaptive reuse of existing buildings under real-world redevelopment rules.
– Built transformation pipelines converting architectural layouts into structured grid representations for computation.
– Implemented validation logic to prevent infeasible layout generation and enforce structural and adjacency constraints.

Tech Consultant (Intern) | I-TEK RFID
June 2025 – Aug 2025

– Developed a production C utility to configure and operate RFID readers across retail and logistics workflows.
– Integrated reader operations with backend infrastructure to enable centralized device management and repeatable deployments.
– Designed system architecture for RFID-based walkthrough checkout, defining data flow, reader placement, and transaction handling.

AI Developer / Web QA & UX (Intern) | Viridium.ai
May 2025 – July 2025

– Built and tested AI-assisted search features integrated into a production web application.
– Implemented response validation logic across multiple model outputs to improve consistency and reduce incorrect responses.
– Performed QA testing across functionality, performance, and accessibility prior to release.

Projects

Real-Time Microstructure Trading Engine | Python, AsyncIO, Schwab Streaming API

– Designed and deployed a low latency event driven trading system processing L1/L2 and time and sales data across ~15 exchanges.
– Built async data and execution pipelines with imbalance detection, cooldown safeguards, and SQLite-backed monitoring.
– Executed $1M+ live trading volume since Jan 2026 with deterministic risk controls, maintaining stable operation and positive net profitability.

FitAI — AI Fitness Platform | SwiftUI, Core Data, Firebase

– Built and deployed a production iOS application for generating and tracking workouts using rule-based validation and user feedback loops.
– Designed data pipelines to track workouts, body metrics, and session history with consistent state management.
– Integrated Apple Health, authentication, Firebase backend services, and AdMob monetization for full-stack deployment.
– Shipped to the App Store with 100+ downloads, supporting multi-session tracking and consistent real-time user interactions.

Constraint-Based Generative Design Engine | Python, Rhino 8 APIs

– Developed a geometry to grid pipeline converting architectural floor plans into structured representations.
– Generated 100+ valid layouts under structural and adjacency constraints using deterministic validation rules.
– Applied ranking and Pareto analysis to evaluate layouts across sunlight exposure and compactness tradeoffs.

Multi-Model LLM Validation System ("Knowledge Cloud") | Python, FastAPI

– Built a FastAPI backend routing queries across multiple LLM APIs for cross-model validation and response consistency.
– Improved reliability by enforcing validation sequencing across model outputs before returning responses.
– Deployed RESTful APIs serving validated responses in real time for downstream applications.

Education

Bachelor of Science in Computer Science
2022 – 2026
The Pennsylvania State University – University Park
GPA: 3.51 / 4.0
Entrepreneurship and Innovation – Minor

Technical Skills

Languages: Python, C/C++, Java, SQL
Backend & Systems: FastAPI, REST APIs, Streaming APIs, Real-Time Processing, AsyncIO, Hardware Integration
AI & Modeling: LLM Integration, Validation Pipelines, Constraint-Based Modeling, Generative Systems