

Ruthvik Uttarala | Software Engineer

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Work Authorization: F-1 OPT, STEM OPT eligible through 2029

EDUCATION

Pennsylvania State University-University Park: BS in Computer Science Dec 2025
Certifications - AWS Certified Machine Learning Engineer, AWS Certified AI Practitioner, Product Innovation Entrepreneurship Certificate
Awards - The President Walker Award, Penn State academic distinction

TECHNICAL SKILLS

LANGUAGES & FULL STACK: Python, SQL, JavaScript, TypeScript, C++, Java, React, Next.js, Node.js, Flask, FastAPI, RESTful APIs, GraphQL, backend, full-stack, HTML5, frontend, Redis, Firebase, JWT, Django, DynamoDB
CLOUD & DEVOPS: PostgreSQL, MySQL, MongoDB, Git, NoSQL, Supabase, AWS, Google Cloud, S3, Lambda, ECS, CloudWatch, Docker, GitHub, Slack, Linux, Kafka, RabbitMQ, Spark, GitLab, Agile, Automated testing, LLM, PyTorch

WORK EXPERIENCE

Software Engineer at OptimalHub LLC Feb 2026 - Present
(Python, Flask, TypeScript, Node.js, React, REST APIs, AWS Lambda, Amazon S3, DynamoDB, Kafka, Firebase, Firestore, Docker, CloudWatch)

- Rearchitected PDF processing into asynchronous Python and Flask services on AWS Lambda, using Amazon S3 and Aiven Kafka to decouple extraction workloads from API requests and support retryable jobs.
- Prevented duplicate parking violation records from repeated vehicle events by implementing idempotent TypeScript processing, time-window deduplication, and Firestore transaction locks in Firebase Cloud Functions.
- Automated PDF extraction and export into 4 formats, including Excel, Word, JSON, and text, by integrating Gemini with PyMuPDF and pdfplumber and validating structured output before file generation.
- Secured 2 applications by implementing server side role based access controls using Firebase Authentication and Firestore for PARKSOL and DynamoDB backed authentication and authorization for PDFextract.
- Delivered a React parking operations dashboard through 5 successful Vercel production deployments, providing authenticated access to Firestore-backed vehicle events, violations, and operator notifications.
- Stabilized PDFextract releases by resolving Kafka ACL and SCRAM authentication failures, AWS Lambda packaging issues, and retry-state conflicts, validating fixes against 123 passing backend tests.

Researcher at Plant Village Jun 2025 - Aug 2025
(Python, FastAPI, REST APIs, TypeScript, Vue 3, PostgreSQL, Amazon S3, LangChain, LangGraph, ChromaDB, LangSmith, Promptfoo, Docker)

- Developed 8 versioned REST API endpoints using Python and FastAPI, integrating PostgreSQL conversation persistence, Amazon S3 image storage, and a Vue 3 frontend for agricultural advisory and image analysis workflows.
- Evaluated a LangChain, LangGraph, and ChromaDB RAG pipeline using 24 agricultural test prompts and 179 LangSmith traced query executions to investigate response latency and retrieval behavior.
- Expanded automated regression testing to more than 150 Python and TypeScript test cases, validating REST APIs, PostgreSQL sessions, authentication, image uploads, and Vue 3 conversational workflows.

LEADERSHIP EXPERIENCE

Startup Founder and Accelerator Participant at Happy Valley Launchbox May 2023 - Jun 2025

- Earned selection into Penn State's competitive FastTrack Accelerator with a 25% acceptance rate, securing expert mentorship to advance Ramaniyam's business strategy.
- Directed 7 creator partnerships producing 25+ promotional posts, contributing to a reported 40% increase in engagement and 15% growth in weekly sales for Ramaniyam.
- Led a 3 member founding team to shape and pitch MentorYou.ai through Idea TestLab, translating student feedback into a personalized academic planning concept and product strategy.

PROJECTS

Flowwick - AI Powered E-commerce Product Launch Platform
(Next.js, React, TypeScript, Supabase, PostgreSQL, Shopify GraphQL, Instagram Graph API, OpenAI)

- Engineered a full-stack commerce application using Next.js, React, TypeScript, and Supabase, building 33 API route files to support authenticated product management, merchant onboarding, and image uploads.
- Integrated Shopify Admin GraphQL and Instagram Graph APIs into a 2 channel publishing workflow, implementing OAuth connections and channel-specific error reporting to surface incomplete publishing operations.
- Developed AI assisted product listing workflows using OpenAI GPT 4o mini to enhance titles and descriptions, integrating input validation, error handling, and merchant-editable outputs to streamline product preparation.

NovaArchitect - AWS Infrastructure Cost Optimization and Simulation Agent
(Python, FastAPI, AWS, Amazon Bedrock, Pydantic, pytest)

- Developed a Python and FastAPI cloud discovery service integrating 4 AWS service families through boto3, with STS identity verification, paginated retrieval, and partial-failure reporting to consolidate infrastructure metadata for analysis.
- Engineered an Amazon Bedrock Converse pipeline with Pydantic schema validation, JSON recovery, retry logic, and deterministic fallback plans to handle malformed AI responses and maintain valid analysis outputs.
- Implemented 7 REST API endpoints and 41 automated test functions across 13 pytest modules, covering API contracts, AWS discovery failures, AI response recovery, reporting, and infrastructure action policies.