

Paxton Banerjee

☎ (919) 555-4832 ✉ paxton.banerjee@example.com

🌐 linkedin.com/example/paxtonbanerjee 📍 Cary, NC 27513



SUMMARY

Senior network and automation engineer with 9 years of experience delivering **production software**, AI enabled operations tools, network integrations, and reusable engineering services. Builds Python solutions from architecture through release, support, and continuous improvement across complex operational environments. Practical work includes agentic AI, Google ADK, LangChain, LangGraph, LangFuse, SCAPE, **Retrieval Augmented Generation**, vector search, **knowledge retrieval**, **contextual reasoning**, APIs, workflow orchestration, and enterprise data integration. Leads design reviews, code reviews, testing, research, vendor evaluation, release planning, and technical documentation with platform engineers, architects, data teams, product partners, and operations stakeholders. Combines network expertise with thoughtful collaboration, clear technical decisions, and process improvement that strengthen reliability, employee experience, and customer outcomes.

EXPERIENCE

Senior Automation Engineer

July 2023 - Present

AsterWave Networks

Raleigh, NC

Leads production engineering for network operations automation, AI workflows, integrations, and reusable services. Guides architecture, delivery, research, and cross functional decisions for reliable support platforms.

- Defined Python service boundaries and API contracts for network incident workflows, improving release consistency.
- Built **LangChain** and **LangGraph** troubleshooting agents with LangFuse tracing, giving support teams guided context.
- Designed **vector search RAG** services with ingestion testing, retrieval evaluation, and response quality controls.
- Integrated ticketing, telemetry, network management, and enterprise data systems through versioned **APIs**.
- Chaired design and **code reviews**, aligning architects, data engineers, and operations on resilient releases.
- Directed AI orchestration evaluations, producing case studies and recommendations for production implementation.

Network Software Engineer

March 2021 - June 2023

Northstar Fiber Solutions

Charlotte, NC

Developed Python services and integrations for network provisioning, workflow automation, **knowledge retrieval**, and operational support. Translated frontline requirements into tested designs, research findings, and maintainable releases.

- Automated provisioning validation with **Python**, improving consistency before regional network changes reached production.
- Connected workflow tools, inventory systems, controllers, and support platforms through documented API contracts.
- Indexed runbooks for retrieval prototypes, testing search relevance and **contextual reasoning** with support engineers.
- Defined algorithms for configuration analysis, converting operational needs into testable software designs.
- Delivered production code, peer reviews, automated tests, and release support for network operations services.
- Presented vendor and internal tool evaluations, helping leaders select practical implementation approaches.

Network Automation Engineer

June 2019 - February 2021

Redwood Communications Lab

Durham, NC

Engineered network inventory, device health, workflow, and knowledge lookup automation. Partnered with engineering and frontline users on specifications, prototypes, testing, documentation, and **process improvement**.

- Reconciled network inventory with Python APIs and operational data from multiple source systems.
- Created reusable authentication, validation, logging, and error handling libraries for engineering workflows.
- Modeled operational requirements as specifications and test cases with **network engineering** partners.
- Compared workflow orchestration prototypes against integration effort, maintainability, and operational fit.
- Authored API documentation, evaluation plans, and test reports supporting release decisions.
- Mapped manual support steps with frontline users, identifying practical candidates for **automation**.

Associate Network Engineer

July 2017 - May 2019

Piedmont Digital Infrastructure

Greensboro, NC

Supported Ethernet and IP network operations through analysis, early automation, integration testing, documentation, and supervised **technical research**. Converted recurring support patterns into clear improvement requirements.

- Analyzed alarms, inventory, configurations, and tickets to prepare accurate actions for senior engineers.
- Wrote Python utilities for recurring data checks and network maintenance reports.
- Tested API endpoints and integration behavior, recording defects and validation results for developers.
- Maintained test evidence, engineering documentation, and change records for release reviews.

- Investigated recurring support issues with operations and software teams, clarifying requirements for tooling.
- Executed lab test plans for automated network checks, presenting findings to engineering leaders.

PROJECTS

Agentic Network Troubleshooting Service 📅 2025

Built a guided troubleshooting service with LangChain, LangGraph, LangFuse, retrieved engineering knowledge, operational tools, and controlled reasoning paths. Testing supported a production ready design.

Network Knowledge Retrieval Platform 📅 2024

Created a vector search and RAG prototype for runbooks and engineering references. Retrieval evaluation, traceability, and contextual reasoning tests shaped release recommendations.

Operational Integration Framework 📅 2022

Developed reusable API patterns connecting workflow orchestration, inventory, network controllers, telemetry, and support systems. Documentation improved handoffs and failure analysis.

LEADERSHIP & AWARDS

- Technical lead for AI orchestration research, guiding prototypes, evaluations, and production recommendations across engineering teams.
- Recognized by architecture and operations leaders for clear technical documentation, practical research findings, and dependable release decisions.
- Led cross functional design reviews that aligned platform, data, product, and frontline operations partners around maintainable automation.

EDUCATION

Bachelor's Degree in Computer Engineering

2017

North Carolina State University GPA: 0

Raleigh, NC

Coursework: Software engineering, computer networks, artificial intelligence, systems integration

CERTIFICATIONS

- Cisco Certified Network Professional Enterprise 📅 2024
- AWS Certified Developer Associate 📅 2025

TECHNICAL SKILLS

- **Programming Languages:** Python, API scripting, algorithm design
- **AI Orchestration:** Google ADK, LangChain, LangGraph
- **AI Observability:** LangFuse, traceability, response evaluation
- **Retrieval Systems:** RAG, vector search, knowledge retrieval
- **Network Platforms:** Network controllers, Ethernet, IP networking
- **Integration APIs:** REST APIs, API contracts, versioned interfaces
- **Workflow Systems:** Workflow orchestration, ticketing systems, support systems
- **Data Integration:** Telemetry sources, inventory systems, enterprise data
- **Software Delivery:** Testing strategies, release planning, production support
- **Engineering Methods:** Code reviews, architecture reviews, technical design
- **Research Practices:** Prototypes, case studies, evaluation plans
- **Documentation:** Technical requirements, API documentation, test reports

SKILLS

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|--------------------|-----------------------|--------------|--------------------------|
| • Python | • APIs | • LangChain | • Workflow orchestration |
| • AI orchestration | • Systems integration | • LangGraph | • Technical research |
| • RAG | • Network engineering | • LangFuse | • Process improvement |
| • Vector search | • Automation | • Google ADK | |

PROFESSIONAL AFFILIATIONS

- Cisco technical community participant, sharing network automation practices with engineering peers.
- Python engineering community participant, exchanging approaches for APIs, testing, and production services.

LANGUAGES

- English (Native)
- Bengali (Proficient)

ADDITIONAL INFORMATION

Work Status : Authorized to work in United States. No sponsorship required.

REFERENCES

AVAILABLE ON REQUEST