Colin Curtis - AI Systems and Software Engineering

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PROFESSIONAL SUMMARY

Software engineering in the AI era is a complex and fast-moving profession where team-work and clear communication is as important as technical skill. Delivering great customer experience and value is the goal. In order to consistently reach that goal, cleanly-architectured systems and a focus on cost-effective practices are the vehicle.

EDUCATION

2012 - 2014 M.S. (Physics) at **North Carolina State University**
2007 - 2012 B.S. (Physics w/ Math Minor) at **Appalachian State University**

SKILLS AND INTERESTS

- Professional
    - C4 software system design
    - SOLID, YAGNI, DRY coding principles
    - ICE product/feature design
    - Linear Algebra, Calculus, Statistics, Error Analysis
- Personal
    - Gardening, Cooking, Sci-fi
    - Mountain Biking, Skiing, Running, Soccer

WORK EXPERIENCE

Senior Machine Learning Ops and Software Engineer - Fidelity Investments   April 2023 - Present

- Data Science Platform and MLOps Chapter, AI/ML Solutions Engineering Squad
- Cloud Systems and Tech Stack:
    - AWS: Sagemaker, Cloudwatch, ECR, S3, Bedrock, RDS, EKS, IAM, Cost Explorer
    - Azure: OpenAI (OAI) portal + Tofu (Terraform) for model deployment/management
    - python 3: botocore, flask, fastapi, pydantic, openai, streamlit, pandas, numpy, sqlalchemy
    - Docker, kubernetes, Splunk, Argo, Jenkins, Snowflake, Datadog, jupyter NB
- Projects and Responsibilities:
    - Implemented enterprise-grade JWT authentication system to enhance platform security, enabling identity management and request attribution for data science workflows; enables fine-grained access control and audit capabilities while maintaining compatibility with existing OAuth2-token authentication flows
    - Re-worked automation code (Jenkins) for integration and performance tests on our primary customer-facing application, GenAI Gateway; upgraded the test-runners to run on a weekly schedule in addition to manual usage; modified the test suites to upgrade lower-env deployed applications to their latest version(s) before launching tests against them
    - ML-training/inference cost-savings initiative, five-figure monthly savings outcome
    - SSO-authentication flask wrapper to secure data science web apps
    - Tested deployed models for LLM token-usage and response-time metrics
    - Extensive code review and deployment support for engineers and data scientists across teams
    - Handled database migrations, surgery and any other troubleshooting/fixing that needs doing
    - Defined and added new pieces of work to the JIRA ticket queue
    - Onboarded GenAI-Gateway to Fidelity's Enterprise-wide API platform, including careful documentation for team-internal as well as customer usage
    - Anticipate the needs of, and potential issues within, our code and tooling before they arise

Senior Software Engineer - Garner Health   August 2022 - February 2023

- Systems and Tech:
    - Python 3: connexion/flask, psycopg2, sqlalchemy, boto3, pytest, alembic, asyncio, behave
    - AWS: S3, VPC, IAM, RDS, ECR, EKR, Step Functions, Lambda, Transfer Family, Secrets Manager
    - Docker, Kubernetes, Terraform
- Projects and Responsibilities:
    - PGP decryption module for the file ingestion system
    - Designed and implemented Client Data Configuration Versioning
    - System testing of RESTful APIs using Behavior Driven Design (behave library)
    - Product Requirement Documents for engineering/management communications

Software Engineer - Actalent Services   April 2019 - July 2022

- Systems and Tech:
  - Microservices architecture for Bridgestone's tire-design CAD web application
  - Python 3, react.js, numpy, logging, pytest, mongoDB
- Projects and Responsibilities:
  - Designed and built a Dynamometer Dashboard for engine test data analysis at Ford Motors
  - Contributed to Bridgestone tire design CAD/analysis system written in Python 3 and React.js
  - Added 'overlays' to the CAD system, allowing tire engineers to view a transparency of one tire design overlaid on to another
  - Refactored the automatic Excel report generation - tire engineers click a button in the CAD system and the Python back-end generates a downloadable report
  - Converted and upgraded FMAT, a tire image analysis tool, from MATLAB to Python 3 and introduced 'alpha-shapes' computational geometry technique to improve the boundary estimates of complex 2-D shapes

Junior Software Engineer - Renassaince Computing Institute   June 2018 - March 2019

- NIH National Center for Advancing Translational Sciences (NCATS) - Biomedical Data Translator
- Wrote and deployed APIs using Marathon, Mezos, Github, Jenkins, Docker, nginx, and python3

Research Assistant, NCSU Physics   May 2013 - April 2018

- Designed and coded ALAI, a MATLAB application for automating fractal analysis of nanoscopic images
  - Reduced the user's active analysis time, per image, by a factor of ~50
- ANSYS Maxwell mesh-calculation to simulate 3-D electromagnetic fields
- LabVIEW software systems for instrument control and data collection
- Author/co-author of 3 peer-reviewed papers in experimental physics