**CHAKA ALLEN**

**PYTHON DOMAIN ENGINEER WITH ARTIFICIAL INTELLIGENCE**

Python developer focused on design, enhancement, and support to clients’ mission-critical systems, applications, software, and products. Skills include OpenSearch, pandas, spacy, nltk, scikit-learn, pytextrank, AWS, docker, python notebooks, sentence\_transformers, numpy, and langchain experience. Familiar with Angular v16 and Perl. Comfortable with my and flake8, having used them on several projects.

**RECENT TRAINING**

* **10 hrs Databricks**
* **10 hrs AWS Solution Architect certification**
* **5 hours Azure Synapse Analytics**
* **5 hours React**

**SELECTED CONSULTING PROJECTS & ACHIEVEMENTS**

**Python Engineer/ Developer - Contract client: JP Morgan Chase (June 2024 – present, contract)**

* **Responsible for data pipeline development in AWS, moving data to parquet files for transport to a managed virtual server environment.** Utilized pySpark to process data in Databricks environment. Full CICD pipeline process used, including Python3 black for formatting and flake8 for finding code issues prior to deployment.
* **Looking to scale an application targeting Databricks with data withdrawn from Hadoop.** Code runs in multiple environments, including Kubernetes. Testing with pytest, coverage 70 to 80 percent with goal of 90 percent. SONAR tests used as gateway check prior to deployment through Jenkins. Blue Ocean used for Jenkins interface.
* **Created React interface to be used for Net Income calculations tool**
* **Built tools to process Amazon EMR data lake, transferring data to AWS Databricks**

**Contract client: Deloitte (April 2024 – June 2024, contract, short term contract)**

**Python NLP Engineer and Developer, short term**

* **Performed document classification for FEMA disaster reports** using Python, scikit-learn, nltk and pytextrank
* **Ingested documents into OpenSearch, with pytesseract used** for optical search
* **Utilized pandas to separate text into cleaner formats for users.**
* **Python notebooks used to demonstrate capabilities. sentence\_transformers and langchain used to build notebooks for demonstration of nlp capabilities.**
* **Utilized langchain capabilities to bring in embeddings from openai**

**Contract client: Argonne National Laboratories (June 2023 – Dec 2023, contract)**

**Python Prompt Engineer and Developer**

* **Utilized prompt engineering** with GPT-4 to produce python SSO module code to use as plugin to existing internal websites to support move towards increased cyber security and to sunset use of Active Directory direct authentication for these sites. API for existing applications defined by **OpenAPI interface, formerly known as Swagger**.
* **Constructed prompts to eliminate hallucinations generated by GPT-4,** producing clean, maintainable code that utilized the Python onelogin2 package, with working certificates, to successfully replace the current Active Directory implementation. Utilized pySpark to process data.

**Contract client: Common Securitization Solutions** (Oct 2022 – Jun 2023, contract)

Python Architect and Developer

* **Created Docker images running Python, deployed to AWS ECR. Deployed applications to Amazon AWS ECS.** Built applications in Python supporting work done for Fannie Mae and Freddie Mac to support the loan securitization pipeline. Ran images in ECS and stored them in ECR. Applications stored configurations in Amazon **S3**, and utilized **AWS** **Parameter Store** and **AWS** **Systems Manager** to manage parameters across the containerized applications. Used mypy for static type checking during development process.
* **Created sidecar code in Python to run along Java modules.** Sidecar modules were run using a **Python Flask** application. Built modules using Maven with TeamCity. Deployed modules to AWS also using TeamCity, storing artifacts in **Nexus** repository.
* **Tests written using pytest. Unit test mocks used.**

**Python Developer/ Architect - Contract client: Verizon (Nov 2021 – Oct 2022, contract, remote)**

* **Hired as the only consultant working on the project**
* **Developed a flexible automation to assist with configuration of network resources.** Created a front end and back end application designed to configure Cisco routers with configuration details for **AWS Outposts**, entered by the user.
* **Built the front and the back end services.** Front end consisted of chart.js charts for real time metrics monitoring, Javascript and HTML for form creation, Python **Flask** for backend and **AWS, GCP and Microsoft Azure** configuration information gathering. Used Python3 black and flake8 to validate that code was ready for release.
* **Built a Prometheus engine to utilize for gathering data, charted some of the data in Grafana, and used chart.js for the real time data.** Python **asyncio** was used to create the interface between **chart.js** and **Flask**.

**Python Developer/ Architect - Contract client: Turnberry Solutions (Nov 2021 – Jan 2022, contract, part time)**

* **Supported data conversion from TreasureData to Snowflake.** Deployed code through **AWS Managed Workflow for Apache Airflow**. Converted SQL queries from **TreasureData** to **Snowflake**, validated dashboards build in **LookerML** against Snowflake. All applications hosted in AWS.

**Python Developer/ Architect - Contract client: Cognizant (Apr 2021 – July 2021, Short term, remote)**

* **Supported delivery of Django app, in AWS, to Petco.** Mentored team of junior engineers through development and release of **Django, JQuery, and HTML/CSS3** features through **Jenkins** targeting Django application in collaboration with Petco client. Performed code reviews, advised on development algorithms, conducted extended requirement reviews, supported success of feature closure with team, and encouraged ownership of the project and process. Resulted in improved dev team confidence and independence, closure of multiple difficult features, and kudos at the end from the client for the dev team. Python3 black and flake8 were required as part of the CI/CD process.
* **Coordinated communication between technical client leads and development team.** Served to translate understanding of the existing system as communicated by the senior leads at Petco to the development team at Cognizant. Resulted in easier implementation from the Cognizant side, and closure of issues.
* **Django app included Docker containers run in Amazon ECS, also using AWS Lambda functions, numpy prod and dev deployments, admin panel work, front end Javascript modifications and Django forms.** Helped train the dev team on unfamiliar features, aided communication of deadlines to dev team, helped to make deadline accomplishment easier, and took pressure off the product team, allowing the product team to be relieved of dev team management duties

**Python Developer for Prescription Benefit Application - Contract client: FliptRx (Jan 2021 – April 2021)**

**Worked as part of Operations Team, supporting resolution of customer issues.** Worked as part of Operations team to respond to customer issues in **AWS hosted application released through Jenkins**, write code to help improve the process, and communicate with the medical provider to coordinate provider actions to support needs of the customer.

* **Developed several Python 3 Apache Airflow DAGs to process new customers.** Wrote prod data validation DAG using several operators. Processed medical files from provider.
* **Utilized AWS Couchbase as backend with app containerized using Docker.** Wrote SQL queries in Couchbase frontend to pull data from different buckets, summarize results, and analyze data errors. Used mypy for static checks.

**Contract client: Capital One, ModelOne Team (Oct 2020 – Dec 2020, Short term, remote)**

**Python Developer for Access Recommender Tool POC**

* **Developed Python 3 command line code to request access to Capital One resources using Python released through Jenkins.** Project was designed as a short two month proof of concept. The code I wrote served as a wrapper for credentials processing as well as an API call into the service that grants requests. Code was also designed to eventually be integrated into a webservice.
* **Code also checked to see if courses were required prior to access.** Normally, if a person requests access manually, they can be told that they have to complete a course first prior to access being granted. The wrapper I wrote provided an interface to the access API, as well as the API that provided information about those course rerequisites.
* **Added all tests for code, as well as Jenkins configuration for code deployment.** pylint was used, black was used (part of Python 3…formatting tool), and pytest was used for the testing. We also integrated with Sonar and Eratocode.
* **Worked with Bogiefile and Jenkinsfile as part of the effort.** Also utilized the Ogie Slack interface to attend office hours to get accurate information to support deployment of the script.

**Python Developer/ Architect Consultant - Contract client: Zoomi (Feb 2020 – Oct 2020, Remote)**

* **Presented analysis to owners and management regarding potential for expansion of existing AWS containerized code base, using Docker, released through Jenkins.** Analyzed legacy and newly developed code. Wrote new module to import new SCORM course written with Composica authoring tool. Module prepared course for 10 phase processing pipeline which included NLP analysis.
* **Dockerized existing Natural Language Processing (NLP) web app.** Made algorithm more efficient. Mentored younger developer. Enhanced Falcon framework code. Deployed dockerized containers to **AWS EC2** system.
* **Analyzed existing complex platform after SME moved on.** Working on enhancements to legacy platform to support new course analysis. Worked with PHP code to stabilize processing of Totara interface with Moodle learning platform.
* **Added sqlalchemy to python Falcon project to create data model for NLP app. Used numpy technology to analyze word embeddings.**

**Contract client: Cigna** **(Feb 2019 – Jan 2020, Remote)**

**Senior Python Engineer/ Developer Consultant supporting Oracle, Teradata and Spark ETL**

* **Building tools using Python Pandas library to support data validation prior to ETL between AWS hosted Oracle and AWS hosted Teradata, released through Jenkins**. Supporting the movement of these tools to secure production environment using algorithms written in Python. Working on developing the validation as a service to be accessed via Postman. Negotiating security regarding viewing of production data. Could not release without passing flake8 and code coverage requirements.
* **Developing scripts to support data cleaning for address data received from Spectrum address validation tool.** Unicode character removal was the biggest issue.
* **Writing Ansible scripts for dev deployment via Jenkins.** Built automatic deployment script to be used within production environment to establish Oracle Wallet security. Script was initiated through a Jenkins job to allow for SME access without compromising security.
* **Configuring Elasticsearch for single and multi node operation.** Prepared Elasticsearch implementation for on premises use, and developed configuration in preparation for AWS configuration efforts.
* **Coding ETL from Apache Hive to Spark using Scala for Spark** and advanced SQL to support data lake and data warehouse integration**.**
* **Utilizing Docker containers with Ubuntu to deploy various applications.**
* **Configuring Informatica for ETL and workflow development.**

**Contract client: Library of Congress (July 2018 – Feb 2019, Remote)**

**Senior Python Consultant contracted to provide Django and Ansible support**

* **Updated Django 1.11 application running on AWS EC2, using Python 3.5, connected to PostGRES database, released through Jenkins**. Consumed API data from government site to provide SOLR documents consumed by front facing PHP site to provide data used by congress.gov. Used Python 3.6 “black” tool and flake8 for code validation prior to checkin to git. Unit tests were written using unittest and unittest.mock.

**Contract client: Omnicom Media Group (Aug 2018 – Sept 2018, part-time, Remote)**

**Senior Python Consultant contracted to provide Django and VueJS support to multiple apps**

* **Developed VueJS screens related to scoping tool used by media group for internal contract scoping, running on AWS EC2, released through Jenkins.** Developed code using Vagrant CentOS 7 box, running Node.js.

**Contract client: Drakontas (Mar 2018 -- July 2018, Glenside, PA)**

**Senior Python Consultant contracted to provide Django support to the DragonForce app**

* **Updated Django 1.11 application running on AWS EC2 connected to PostGRES database, released through Jenkins.** Modified code used as backend to mobile app used to track real time situation response image data for police and military. Used Websockets, XMPP, Django Channels, Django signals on CentOS 7 to update backend for use in scaling system.

**Contract client: United States Department of Agriculture**  (Nov 2017 – Feb 2018, Remote)

Senior Python Consultant contracted to provide Django support to the FSIS Department

* **Developed code connecting AWS EC2 Django app, released through Jenkins, to Elasticsearch for faster query processing**. Developed front end using Django Forms, ModelForms, CreateView, FormView, Widgets, and Templates. Used JQuery and CSS3 to develop front end. GitLab was used to manage code and issues.

**Contract client:** **Bank of America**  (Feb 2017 – August 2017, Jersey City, NJ)

Senior Python Consultant contracted to provide Flask support for Devops work supporting private cloud development

* **Updated AWS EC2 Flask application connected to MongoDB database, released through Jenkins.** Built server instances used to provide JSON configuration information used by Ansible Playbooks to instantiate servers in private cloud. Used MongoDB command line interfaces to alter collections, validate user interface used to collect configuration information, validated data in Kibana (open source version of Splunk), and performed scripting in RHEL Linux using Bash. Git was used for source control.

**Contract client: Wells Fargo** (Nov 2016 – Jan 2017, Remote)

Senior Python Consultant contracted to provide OpenStack software support to the Private Cloud Enablement group

* **Modifying AWS EC2 Django application** helping to connect new OpenStack instances to Wells Fargo management infrastructure. Branching and merging performed with Git. Puppet is used for deployment and standardization of infrastructure configuration. Development performed using localized RHEL Vagrant instances within VirtualBox on Windows, in Python 2.7.

**Contract client: Billtrust** (Aug 2016 – Nov 2016, Lawrenceville, NJ)

Senior Python Consultant contracted to provide software support to help ease customer integration after a new merger, providing IronPython support, MySQL interface support, and user interface skill to ensure statements and invoices meet customer expectations

* **Developing XML lexing and parsing support for translating heterogeneous AWS based billing system output into usable input for our system,** allowing the core translation system to integrate new customers into the Billtrust billing engine. User interface development involves ensuring look and feel of statements, and invoices satisfy all requirements. MySQL is used as the primary backend for configuring and maintaining status of batch jobs executed against the core software. IronPython is used to interface with a .NET core platform, providing Python hooks used to implement customer logic requirements. C# code provided by the merged company is translated into IronPython logic to control the business process and to support integration into our core system. SVN is used as the configuration management system. Business processes include open balance billing, pass thru processing, statement and invoice output, and electronic/print routing configurations. All development performed on the Windows platform.

**Contract client: Indiana Legislative Services** (Jul 2014 - Aug 2016, Remote)

Senior Python Consultant retained directly and provided 100% remote expertise in bringing in-house, stabilizing, and implementing new features into the Online Legislative Bill Presentation and Voting Service System leveraged by legislators to conduct business electronically.

* **Assumed responsibility for enhancing and stabilizing major components of the AWS EC2 Python tablet-based online voting system, released through Jenkins** that enhanced the recording of all transactions through the House and Senate chambers. Redis was used for recording transactions, and for signaling consumers during votes and roll calls. AngularJS version 1 was used to update the main panel as votes changed, and when speakers requested speaking time. Implemented Continuous Deployment utilizing Jenkins to internal virtual environment. Utilized ActiveMQ for message transfer between website and document conversion application. Communicated with backend using a REST API provided by the third party whose code we inherited. Utilized Puppet to configure Vagrant instances used as test box prior to deployment to our virtual dev environment.
* **Designed, developed, tested, and implemented front- and back-end enhancements** that increased usability leveraging Python 2.7, WebSockets, Django 1.8, redis, Javascript, Angular.js, HTML, and CSS technologies. One enhancement included an optimization of ODT to PDF conversion that allowed us to sunset a Java app, and improve the performance dramatically. Another was to improve the UI look and feel of the Reporting tools used to communicate with legislators, and accurately represent the status of the system. Another was an enhancement to a simple Django app that visualized the backend SVN database as a file system, using third party code. This enhancement allowed business analysts to acquire behaviors they were accustomed to having, including multiple file moves, multiple selections, and other visual updates to a web based home grown file browser.
* **Executed the conversion from Django 1.4 to 1.8 and changes to JavaScript code to support Django template changes in 1.8. Upgraded the Voting System from Python 2.6 to 2.7.** Built and deployed RedHat RPMs for internal distribution on Red Hat Enterprise Linux 6.2. After conversion of the Voting application, and after deployment, no production level bugs were reported. The stability was sufficient to prevent emergency releases throughout the entirety of the legislation session.
* **Replaced SVN version control system with Git for front-end enhancements.** Leveraged GitLab to submit merge requests following check-in leveraging Git remote update and push.

**Contract client: Bank of America** (Nov 2012-Apr 2014, Jersey City, NJ)

Contract as Consultant as a team member of 8 to develop risk management tools leveraging the Python framework to automate the identification and mitigation of risks.

* **Wrote Python 2.6 code in a Windows environment to build rich user interfaces** and provide business with improved visibility on data / metrics to manage risk. Contributed to design sessions, helping to drive the product roadmap. Utilized a NoSQL database built by Bank of America to manage Python objects, utilized as risk analysis artifacts. Leveraged the Quartz Python platform (> 1M line Python framework) to build application.
* **Leveraged Agile process and JIRA issue management tool** to track the Sprint cycles. Built interfaces based on designs, reviewed screenshots with business partners, developed functionality, and rigorously tested features with internal QA team and business users. Iterated on QA and Production releases, partnering with Business Analysts and management to make sure customer requirements were satisfied.

**Contract client: Idirect, LLC.** (Nov 2011 – Nov 2012, Herndon, VA)

Recruited as Consultant to advance critical project for satellite internet communication equipment created to support Ka band satellite technology for use in providing internet services on planes, ships, and remote locations.

* **Designed, implemented, and tested Network Acquisition Server leveraging** **C++** on **Red Hat Enterprise Linux 6 to authenticate remotes prior to acceptance into network.** Ported tens of thousands of lines of code for new system from CVS to Git.
* **Led institution wide integration team for first drop of software,** coordinating efforts with principal engineers to successfully demonstrate system to customers.
* **Developed C++ classes to implement data plans for selling bandwidth and throttle bandwidth to distribution partners.** Modified Makefiles to support new automated build system using Jenkins. Developed code using JSON for file processing.
* **Built an UML design in two weeks for a proxy client used to transmit statistics to a proxy server.** Mentored junior engineers and new contractors.

**Contract client: Vectorworks, Inc.** (Oct 2011 – Nov 2011, Columbia, MD)

Retained as Consultant to assist in developing a Web-based Payment System leveraging the Django Framework.

* **Developed the payment processor leveraging PayPal and Python 2.6 on Windows** to support online PayPal payments and subsequently alternative vendors**.** Deployed the Django website using Amazon EC2 environment and fabric.

**Contract client: General Dynamics Robotics Systems and Honeywell** **(Dec 2010-Oct 2011, Morristown, NJ)**

Chosen by Honeywell and subsequently by General Dynamics to assist in developing software in support of the Autonomous Navigation System (ANS) for the Brigade Combat Team Modernization (BCTM) Program.

* **Developed, tested, and implemented autonomous navigation software for ground-based vehicle transport leveraging C++ and Python 2.6** on Red Hat Enterprise Linux 5.3.
* **Designed, wrote, and implemented code to provide enhanced ISR and maintenance capabilities to soldiers in combat utilizing C++, DB2, XML, Perl, and QT** on Red Hat Enterprise Linux 5.3.

**Contract client: BAE Systems** (Jan 2009 – Oct 2010, Nashua, NH)

Brought in as a Consultant member of the Senor Image Processing Lab to develop new data analysis tools for $1.4B contract to build the Common Missile Warning System.

* **Developed and tested code leveraging C, C++, FORTRAN, ADA, and PV-WAVE technology** for the launch of the next-generation laser countermeasures system and enhance the protection of helicopters and attack aircrafts against heat-seeking missile threats.

**Contract client: Vertex, Inc. (May 2008 – Oct 2008, Berwyn, PA)**

Retained as Consultant to develop enterprise test integration & automation suite for Vertex Enterprise, an end-to-end tax processing solution.

* **Developed, tested, and implemented tools leveraging Python 2.5 in Windows** that strengthened the integration testing and automated the configuration of product.

**EARLIER EMPLOYMENT EXPERIENCE & CONTRIBUTIONS**

**Susquehanna International Group** (2007-2008, Bala Cynwyd, PA)

Recruited as a Senior Software Engineer for this global technology-powered financial trading firm to develop, enhance, and support the Arbitrage Strategy Framework utilized to simulate, validate, and strengthen trading strategies created by Analysts on proprietary trading on stock markets across the country.

* **Created new tools leveraging C++ and Python 2.5 on Linux to enhance overall success of trading strategies**. Developed interfaces for computing skew amongst collected data sets, provide statistical data on collected ticket data, and enable rending on Graphical User Interfaces (GUIs).

**Alliant TekSystems** (2005-2007, Woodand Hills, CA)

Brought in as a Senior Software Engineer for key DoD Advanced Anti-Radiation Guided Missile (AARGM) Program.

* **Designed and implemented software to enhance the range and accuracy of the missile leveraging C++ on Windows** across a CMM Level 3 environment.

**Northrop Grumman – Xontech Division** (2003-2005, Van Nuys, CA)

Originally brought in by Xontech and kept on following acquisition by Northrop Grumman to develop core modules to support Ground Based Missile Defense (GDM) System simulation prior to delivery to DoD.

* **Designed, developed, and implemented modules to simulate functionality of radar and defection systems** across a CMM Level 3 environment.

**Teradyne – VLSI Test Division** (1998-2002, Agoura Hills, CA)

Earned promotion to Senior Software Engineer within 18 months of hire into Software Engineer role.

* **Contributed in developing components to increase functionality and test components prior to integration into the complex testing systems for leading semiconductor manufactures.**

**EDUCATION**

**Master of Science in Computing Engineering**

IOWA STATE UNIVERSITY – Ames, IA (1998)

**Bachelor of Science in Computing Engineering**

IOWA STATE UNIVERSITY – Ames, IA (1996)

Placed Top 10% nationwide on William Lowell Putnam Mathematics Competition, 1994

**PUBLICATION**

Chaka A. Allen, Jennifer L. Davidson, “Steganography Using the Minimax Eigenvalue Decomposition,” Proc. SPIE Conference on Mathematics of Data/Image Coding, Compression and Encryption, vol. 3456, pp. 13-24, July 1998