

# Bharathkumar Ayyadurai

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## Summary

Data Engineer with 4 years of experience in the development, implementation, and optimization of data pipelines and ETL processes, with a Proven track record of spearheading initiatives to automate data validation processes and create high-performing machine learning models. Build and maintain data processing infrastructure on cloud platforms such as AWS and Azure. Developed and maintained automated CI/CD workflows and tools for code deployment.

## Experience

### Data engineer

01/2022-present

#### Techy Geeks IT

- Build an data pipeline using **AWS Kinesis**, **AWS Glue**, and **PySpark** specializing in transforming raw machine data into actionable insights for predictive maintenance.
- Implemented algorithms **Random Forest** and **Gradient Boosting** to develop predictive models, achieving a 70% improvement in early detection of potential equipment failures and minimizing downtime.
- Integrated **MLOps** practices, leveraging **AWS SageMaker** and **MLflow**, to streamline model training, deployment, and monitoring.
- Leverage **AWS Glue** for **ETL** processes, extracting financial data and utilizing **Python scripts** for transformation before loading into **Snowflake**.
- Utilized financial statistical models, including **Monte Carlo simulations** and **Black-Scholes pricing**, within **AWS SageMaker** for precise portfolio analysis, optimization, and future outcome predictions.
- Orchestrate the workflow with **Apache Airflow**, ensuring seamless execution, and deploy results using **AWS CloudFormation**, showcasing insights in **Power BI** for intuitive visualization.
- Implement continuous deployment practices, monitoring with **CloudWatch**, ensuring a dynamic and responsive data engineering and machine learning pipeline.

### Data Analyst(R&D)

05/2019 – 08/2020

#### Integra Software Services Private Limited

- Routed IoT sensor data seamlessly from **Azure IoT Hub** to **Azure Data Factory** and further processed it in **Azure Databricks**, or enhanced ETL within the Azure ecosystem.
- Applied **time series analysis techniques** (STL) to uncover seasonal patterns in energy usage, leading to a 90% improvement in identifying peak consumption periods.
- Implemented **anomaly detection** using models like Isolation Forests and One-Class SVM, resulting in a 85% increase in accuracy for detecting irregular energy consumption.
- Employed **K-Means clustering** for consumer segmentation based on energy consumption profiles, using features engineered from the cleaned data.
- Collaborated closely with the client's sales teams to strategically modernize data infrastructure, migrating historical data to Azure .
- Implemented Azure Machine Learning for predictive analytics for data-driven sales foresight. Utilized **Azure Synapse Analytics** for efficient data processing and advanced analytics.
- Employed an **agile DevOps methodology** with Azure DevOps and **Azure Kubernetes Service**, ensuring seamless deployment and continuous improvement based on iterative analysis of historical data.

### Python web developer(Intern)

11/2017 – 12/2018

#### HashInclude Computech Private Limited

- Architected dynamic web applications using **Python**, **Django**, **HTML**, **CSS**, and **JS**, to enhance user interaction and experience.
- Spearheaded Azure cloud deployments, employing **Docker** for containerization and **Terraform** for Infrastructure as Code, Instituted **Git**-based version control workflows, implemented **CI/CD** pipelines using **GitHub Actions**

- seamlessly integrating **REST APIs** and **PostgreSQL** to establish a robust and scalable backend architecture.
- Engineered chatbot systems featuring web scraping functionality using **Selenium**, **BeautifulSoup**, and **XPath** to extract data from diverse online sources.
- Implemented regular expressions (**regex**) for data cleaning, resulting in a 45% enhancement in the quality of the extracted information. Additionally, integrated natural language understanding (**NLP**), leading to a 80% improvement in logical comprehension of user queries and contextually appropriate responses.
- Engineered a sophisticated database system with proactive stock shortage detection algorithms to **optimize** inventory management and ensure uninterrupted product availability.

## Education

**Global Certificate in Data Science & AI -INSAID(Diploma)** **03/2022-12/2022**

**Modules Learned:-**Python, Data Analysis, Tableau, ML, OpenCV, NLP, Tensorflow and DeepLearning,

**Projects done:** Sales Forecasting, genetic variant classification, Analysis of HMDA data

**Masters in Big Data and High-performance Computing** **09/2020- 11/2021**

**University of Liverpool**

**Modules Learned:**Big data analytic, Optimization, Data mining and visualization, Machine learning

**Projects done:** Developed CNN model for bio-energy source identification and comparing ML techniques.

**Bachelors in Computer science** **05/2015- 04/2019**

**S.R.M University**

**Modules learned :** Oops, Database management, cloud computing, web development

**Project done:** Developed a real-time intelligent camera monitoring system leveraging CNNs within the OpenCV Python framework.

## Technical Skills

<b>Python:</b>	Django, FastAPI,request, unit test, pytest, Streamlit,JSON, OAuth
<b>ML:</b>	NumPy, Pandas, Scikit-learn, TensorFlow,PyTorch, SciPy, Time-series analysis, Anomaly detection, Prediction,clustering
<b>Analytical:</b>	Dask, Matplotlib, Seaborn, Statsmodels, Geopandas, SQLAlchemy, PowerBI
<b>DeepLearning:</b>	Tensorflow,CNN,Gan,LSTM,NLTK,OpenCV,LLM
<b>Web Scrapping:</b>	Selenium, BeautifulSoup, Xpath
<b>Database:</b>	PostgreSQL, MySQL, Sqlite, MongoDB, snowflake
<b>Cloud:</b>	Azure,AWS
<b>CI/CD:</b>	GitHub, Jenkins, Docker, Kubernetes, Ansible, Terraform
<b>web Development:</b>	HTML, CSS, JavaScript

## Other technical skills

- Developed a real-time Python trading bot with technical indicators for trading decision-making
- Had hands-on experience with geo-spatial analytic using ArcGis and processed USGS data.

## Certifications

- IBM Data Science Specialization
- Microsoft Azure data engineering associate
- AI Machine Learning Specialization. Stanford University & DeepLearning.
- Generative AI for Developers Learning Path from google skill learning
- Artificial Intelligence Job Simulation from cognizant

## Portfolio

- **Linkedin Profile:** <https://www.linkedin.com/in/bharathkumar-ayyadurai-612607158/>
- **GitHub Profile:** <https://github.com/Bharathkumar2704>
- **Portfolio:** <https://bharathkumar2704.github.io/Portfolio/>
- **Kaggle:** <https://www.kaggle.com/bharath2704>
- **Medium:** <https://medium.com/@a.bharath98>