

GANESH P SHIVAKUMAR

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Open to Relocate

SUMMARY

Experienced **Senior / Lead Software Developer / Machine Learning Engineer** with **6+ years** of expertise in building large-scale, high-performance distributed systems and **e-commerce** search. Proficient in **Java** and **Python, GoLang** with deep knowledge in **Machine Learning, SQL/NoSQL** databases, **BigData** processing, and cloud technologies (**AWS/Azure**). Skilled in DevOps practices. Specialize in Search & Recommendation Systems, Personalization, LLMs, and Generative AI.

Key Achievements:

- Played a pivotal role in a startup's journey from inception to its ~\$100 million acquisition.
- Held significant positions at **Amazon, and Amazon Robotics**, and collaborated with dynamic teams at Microsoft.
- Led the development of ML pipelines and LLMs at **Google for Developers**.

SKILLS

- **Languages:** Java, Python, C#, R, Javascript, ReactJS, NodeJS, Scala, Bash, Redux, HTML
- **Statistics:** Inferential Statistics, Experimental Design, Hypothesis Testing (A/B Testing)
- **Big Data:** Hive, Hadoop, Scala, Spark, Sqoop, AirFlow, Cassandra, Kafka, Kinesis, Zookeeper, Grafana
- **DataBases:** SQL, MySQL, PostgreSQL, DynamoDB, MongoDB, Redis, RedShift, Neo4j, AeroSpike
- **Cloud:** AWS (Lambda, Glue, Kryo, EC2, CloudWatch, S3, Redshift, EKS, IAM), Azure, GCP
- **CI/CD:** Travis, GitHub Actions, Jenkins, Docker, Kubernetes, ELK, Prometheus, Flink
- **Frameworks:** Tensorflow, Keras, Torch, Django, Gunicorn, Flask, Numpy, Pandas, Jupyter
- **Search FrameWorks:** Lucene, Apache Solr, Elasticsearch
- **Certifications:** Coursera Neural Networks and DeepLearning, Udemy Certified Kubernetes Administrator

PROFESSIONAL CERTIFICATIONS AND ACHIEVEMENTS

- Featured on the “Employee Spotlight” for **leading** an engineering team of **10 people** to create tools for catalog extraction and indexing to conceptualize, design, and maintain the whole pre-processing catalog pipeline
- Received “GoGetter & Challenger” recognitions consistently for my persistence and problem solving ability at work
- Awarded “Most Valuable Player” by Unbxd, for teamwork and spearheading several teams to excel in innovation
- Headed HackAI (Largest AI hackathon) organized by the Artificial Intelligence Society at Northeastern University, and the third iteration of WEHack hackathon, as part of Techmakers

PROFESSIONAL EXPERIENCE

GOOGLE FOR DEVELOPERS (NEU STUDENT CLUB)

Boston, MA

Machine Learning Researcher

Sep 2023 – Present

- Led the development of **LLMs (BERT, GPT2)**, **multi-modal variational autoencoders (VAE)** with convnets, and transformers, effectively calculating visual semantic embedding in political social media (Instagram) data with 400,000 records
- Facilitated disentangled representation learning and discovered generative factors by implementing innovative latent space exploration, partitioning it into private and shared spaces, enabling controlled robust image and text reconstruction
- Deployed the model on **GCP with advanced loss functions akin to beta-TCVAE**, achieving remarkable generative capabilities and results in generating images from text and vice versa with a 30% boost in processing, enhancing multi-modal data analysis workflows

AMAZON.COM, INC

Seattle, WA

Software Development Engineer

Jan 2023 - Sep 2023

- Achieved 30% reduced response time by changing paginationKey serialization from orthodox string concatenation to **Kryo** on **Java-SpringBoot** based REST application
- Optimized retrieval of Quadrillion bytes of data from **Data Planes (Cairns, Andes)** by redesigning paginationKey whilst orchestrating data storage. Deployed this crucial **API** change with zero percent downtime on the existing traffic leveraging **Amazon Weblab**
- Evolutionized paginationKey which helped in modifying in-memory processing of inPredicate queries to logically evaluated queries, reducing memory usage by 50% that helped handle system overhead. (Stack: **AWS Glue, AWS Lambda, DynamoDB, Kryo**)

AMAZON ROBOTICS

Boston, MA

Software Development Engineer

Jan 2023 - May 2023

- Pioneered a data pipeline with **Kinesis Data Firehose - SNS - Lambda in Python**, establishing a pub-sub architecture for sharing real-time package details among downstream services.
- Significantly minimized the time lag between real-world events and software execution by implementing a **near-real-time data snapshot** dissemination mechanism.
- Surpassed expectations by implementing in-memory snapshot solutions to reduce storage overhead, whilst achieving updated info-delivery in milliseconds through **SNS** topics
- Developed a **CDK package** for downstream services, enabling in-memory snapshots in a central storage system for package info updates, achieving 99% synchronization between the system and real-world package movement

UNBXD INC. A NETCORE COMPANY

Lead Software Developer / Solution Architect

Nov 2017 - Dec 2021

- Managed team of engineers to build generic **Shopify e-commerce app** in **NodeJS** with **GraphQL queries**, and **JS WebHooks** for fetching catalog from the platform. The tailored app injects **CDN ReactJS scripts** to enable custom search. Helped in reducing customer onboarding time by nearly 70%.

- Created an auto scalable platform to fetch and index catalogs from one e-commerce platform to another. Application built and deployed using **Argo workflow, Kubernetes, and Terraform**, where the **Kube pods** will be rolled up as per the load. (Stack: **Python, MongoDB, Django, Celery**).
- **Led** comprehensive testing initiatives including Above the Line (**ATL**), Below the Line (**BTL**), and User Acceptance Testing (**UAT**) for order analytics systems using **Python**, ensuring accuracy, reliability, and user satisfaction. (Stack: **Selenium, Apache JMeter, GoogleAnalytics, Swagger, PyMock**)
- Initiated and architected a **Kubeflow-based ML pipeline** for entity extraction (**NER**), personalized scoring, recommender model training/testing, and Topic Modeling, yielding a **25%** increase in customer conversion. (Stack: **Glue, Python, PostgreSQL**)
- Coded auto scalable **Python/FLASK application** for **Automating SOLR** cloud clusters auto recovery from various outage scenarios. This took care of **JAVA GC outages** and reduced overhead for SOLR maintenance. (Stack: **Linux, Kubernetes, Helm, MongoDB**)
- Created an auto scalable RESTful platform using **Python-GuniCorn-PostGreSql** to fetch and index catalogs from one e-commerce platform to another. Worked for multiple e-commerce platforms like Shopify, and AdobeCommerce. (Stack: **Python, Gunicorn, Celery, PostgreSQL, Swagger**)
- Coded **RESTful Application in Java with Junit tests** for refactoring **Query Processing Layer** to centralize all the e-commerce search query rewrites and reformulations. Reduced network hops & **API latency by 20%**. (Stack: **SpringBoot, Java11**)
- Mitigated data quality risks by **35%** by developing **advanced SQL queries, Stored Procedures, and Functions**. Performed **ETL/ELT** for direct data ingestion from diverse unit sources, and large-scale data processing using **Spark** and **MapReduce**.
- Pioneered customer propensity scoring Learning To Rank models utilizing (ML) **Gradient Boosting Decision Trees (xgboost)** to rank products based on user analytics, which enhanced Order conversion rates by 20% across users
- Reduced response time by 25% by deploying an embedding-based item recommendation model trained from Factorization Machine, and serving it as an **API** on **AWS EC2** using **FastAPI** and **SCANN**
- Implemented Attention-based **NER** models tailored for healthcare e-commerce queries, leading to a significant **50%** enhancement in search interaction and a consequent **30%** revenue increase. Additionally, built **Tableau** dashboards for visualizing **KPIs**
- Developed Hybrid Memory-Based filtering **Recommender Systems incorporating Transfer Learning**, Graph-based, and Deep Clustering models utilizing **BERT**, resulting in **140% enhancement in MAP@5** for product recommendations.

Software Developer / Data Scientist

Jan 2015 - Dec 2017

- Coded **RestFul application** that validates **JSON schema** using **Talent, MapForce** which extensively used in **Catalog Pipeline Streaming**. Helped in detecting irregularity in data irrespective of formats like **XML, CSV, TXT**.
- Designed and built **Javascript SDKs** in Builder design pattern for integrating Search, TypeAhead, Analytics, and Recommendations on e-commerce websites. This helped in reducing platform onboarding time by nearly 60%. (Stack: **React JS, WebPack, Javascript (ES 6), jQuery, HandleBars**)
- Authored **RESTful Spring boot application in JAVA11** that acts as a source of truth for e-commerce catalogs of indexed sites, used for handling **Differential Indexing using Knowledge**

Graph. Used for reducing internal overload on the search system by **20%**. (Stack: **SpringBoot, Hibernate, Java11, Neo4j**)

- Leveraged **Elasticsearch, Logstash, and Kibana (ELK)** to implement Analytical based Recommendation Systems for powering **personalized recommendations for e-commerce sites**. Created Kibana APM dashboards for monitoring and log analysis
- Developed **PowerBI (Power Query, DAX, JQL)** dashboards to visualize digital KPIs using Time series analysis to track project milestones for 230+ software tools and customer RFQs totaling \$10M in revenue for the organization using Agile Kanban methodology on Jira.

EDUCATION

NORTHEASTERN UNIVERSITY

Boston, MA

M.S. Computer Science (GPA: 4.0/4.0)

Jan 2022 - Dec 2023

Coursework: Algorithms, Programming Design Paradigms, Database Management Systems, Machine Learning, Deep Learning, Large Language Models