Ayush Goel

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EDUCATION

- **University of Pennsylvania** — Philadelphia, PA
  Master of Science in Robotics | GPA: 3.83 — May 2024
  Coursework: *Internet & Web Systems, Software Systems, Operating Systems, Full Stack Deep Learning, Machine Learning, Computer Vision |* **Position:** *Teaching Assistant for Data Structures, Algorithms and Software Design; and Operating Systems*

SKILLS SUMMARY

- **Programming**: C++, Python, JAVA, Shell Scripting, AWS, ElasticSearch, CUDA, JavaScript, Android
- **Tools**: Git/GitHub, Docker, Jenkins, CMake, SQL, Maven, MongoDB, Linux, Microservices, Apache Tomcat
- **AI/ML/Robotics**: ROS(1&2), OpenCV, PCL, PyTorch, scikit-learn, pandas, TensorFlow, Tensor-RT, ONNX, MLOps

WORK EXPERIENCE

- **TDK InvenSense** — San Jose, California
  Robotics Software Engineering Intern — May 2023 - Present
  - Designed an efficient **AWS pipeline** combining IoT, Lambda, and Elastic Search; coupled with ROS2 C++ drivers, resulting in a **50%** surge in data processing speed, **30%** cost savings, and enhanced real-time dashboard.
  - Integrated **ROS2 Nav2** point-to-point navigation for mobile robots using **LiDAR, Depth Cameras**, **IMUs** with SLAM toolbox for **Lifelong Mapping** optimized adaptability with **Behavior Trees** for increased efficiency.
  - Crafted a robust object detection system using **NVIDIA Issac** SDK, merging **Depth Camera** imagery with **3D point clouds**, achieving a **60% mAP** and reducing false positives for improved robotic reactions.

- **Unicommerce eSolutions Pvt. Ltd.** — Gurugram, India
  Senior Software Engineer — Aug 2019 - July 2022
  - Managed & mentored team of Software Engineers as **Team Lead**, delivering high-quality products. Innovated **infrastructure redesign**, leveraging **residential** & **datacenter** proxies with **load distribution** & **IP-rotation**, achieving **25%** cost reduction. Introduced self-service optimization tools, notably reducing in support tickets.
  - Led **design** & **architecture** of a robust platform, overseeing both **high** & **low-level design** changes, spearheading integration with major international marketplaces like Lazada and Shopee, expanding company's footprint to **7** international regions. Played pivotal role in maintaining in-house DSL for partner system integrations.

- **Capgemini India Pvt. Ltd.** — Pune, India
  Senior Software Engineer — Sep 2018 - June 2019
  - Spearheaded migration of **Malaysia's CIMB Bank's** financial web app from SOAP to **RESTful APIs** & pioneered development of 'Capbook', enterprise social media platform using **React** & **Spring**, serving 500+ employees.

SOFTWARE PROJECTS

- **End-to-End Microservice Architecture: Scalable Integrations and Performance Optimizations** ▶
  - **Architected** & **deployed end-to-end microservice** using Spring, facilitating **synchronous** & **asynchronous** integrations with diverse logistic, omni-channel, & partner systems; increasing system efficiency by **50%**.
  - **Optimized system scalability** by incorporating a **Load Balancer** employing **Round Robin** logic, boosting system **availability**, enhancing **throughput**, and minimizing **downtime**. Seamlessly integrated **CI/CD** pipelines for automated microservice deployment across multiple server environments.
  - Enriched system performance using **Time-Aware Least Recently Used** (TLRU) cache & employing **aspect**, **event** & **annotation-driven** architectures. Leveraged **ThreadPool executors** for concurrent IO operations.
  - Enhanced system **reliability** by managing SQL and NoSQL databases in **primary-replica** configurations. Successfully integrated major marketplaces and logistic partners, including **Amazon Marketplace (SmartConnect & Seller Party models)**, **CloudTail (Vendor APIs)**, and **Amazon Shipping Provider (Shipping APIs)**.

- **ML Ops-Driven System Design: E-commerce Revenue Forecasting & Continuous Deployment**
  - Architected & operationalized **ML Ops pipeline** for revenue forecasting, leading to **30%** surge in revenue using state-of-the-art machine learning models on historical data, encompassing orders, inventory, and seller metrics, across diverse e-commerce platforms. Ensured model accuracy with continuous training and deployment.

- **Event-Driven Microservice Design: Optimizing Event Routing with AWS EventBridge and SQS**
  - Designed and deployed an **event-driven microservice** architecture on **AWS**, leveraging **EventBridge** to seamlessly intercept and route events from downstream systems to target **SQS** queues. This architectural enhancement led to a **25%** reduction in API calls, optimizing system efficiency by **30%**.
  - Incorporated **CloudWatch metrics** for real-time monitoring of the health and performance of various **SQS** instances, ensuring **proactive** notifications and rapid responses to critical system events.

- **Scalable Log Monitoring System: Enhanced Insights with Elasticsearch and Kibana Integration** ▶
  - Architected **scalable Elasticsearch logging** solution, integrating **Filebeat** at proxy layer, centralizing logs at **Logstash**, streamlining data processing across multiple clusters, efficiently feed them to Elasticsearch instances.
  - Designed comprehensive **monitoring dashboards** in **Kibana**, offering granular visualizations for each metric. This data-driven approach enhanced system insights, leading to a significant **15%** reduction in on-call ticket incidents.