

# Ayush Goel

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## EDUCATION

- **University of Pennsylvania, GRASP Lab** Philadelphia, PA  
*Master of Science - Robotics*  
*Relevant Coursework: Machine Learning, Machine Perception, Computer Vision*  
*expected May 2024*
- **Thapar Institute of Engineering and Technology** Punjab, India  
*Bachelor of Engineering - Mechatronics Engineering | GPA: 3.89*  
*Relevant Coursework: Advanced Control Systems, Robotics Engineering, Kinematics & Dynamics of Machine, Signals & System*  
*Awards: Certificate of Merit for 3 consecutive years*  
*Achievements: 3<sup>RD</sup> rank in Undergrad, Merit-based Scholarships for all 4 years*  
*June 2018*

## SKILLS SUMMARY

- **Programming:** C++, Python, JAVA, Shell Scripting, JavaScript, SQL, MATLAB, HTML5, CSS, XML, NodeJS
- **Tools:** Git/GitHub, Docker, Latex, IntelliJ, Jenkins, Android Studio, MySQL, SQLite, MongoDB, Postman
- **Operating Systems:** Unix, macOS, Windows
- **AI/ML:** PyTorch, Scikit, NumPy, pandas, Matplotlib
- **Technologies:** AWS, Spring Boot, REST APIs, Docker
- **Others:** Data Structures, Algorithms

## WORK EXPERIENCE

- **Unicommerce eSolutions Pvt. Ltd.** Gurugram, India  
*Senior Software Development Engineer ( Team Lead )*  
*Aug. 2019 - Aug. 2022*
  - Responsible and decision-maker of **critical deliverables for high & low-level design changes** and ensuring **robust end-to-end architecture** of the platform.
  - Served as **Team Lead** and **mentored & managed team of Software Engineers** & ensured shipping of **high-quality products; fulfilling 80% more business requirements per sprint.**
  - **Reduced cost of infrastructure** by redesigning integrations for **optimal bandwidth utilization** and implementing **load distribution, IP-rotation**, and fallback to achieve a **25% reduction** in costs.
  - Led integration of International marketplaces; establishing **company's presence** in 7 middle-eastern regions.
  - Regular discussions with **Engineering and Business leaders** for **product and engineering roadmap.**
  - Reduced **On-call ticket count** by implementing **managed self service controls** for **OPS & L1 support.**
  - **Awards:** Above and Beyond Call of Duty (ABCD) Award *[Certificate]*
  - **Tech stack:** Spring Boot, Java, Mongo, SQL, Zookeeper, ActiveMQ, Elastic Search, AWS, Kibana, Grafana

## PROJECTS

- **Led Proxy Service development for Amazon SP and SmartConnect Integration** *[Video]*
  - Pioneered the **design, development** and **maintenance** of an **end-to-end architecture** for a **microservice** in Spring Boot to support **synchronous and asynchronous integrations** with different logistic, omni-channel and external partner systems, thereby increasing the efficiency of integrations by **50%.**
  - Implemented **horizontal scaling** by introducing **Load Balancer** with **Round Robin** logic to route the incoming requests to different proxy instances to increase the **availability of the system, lower downtime and increase throughput.**
  - Integrated **Time aware Least Recently Used (TLRU)** cache, worked on **aspect-driven** and **annotation-driven** architecture, implemented **ThreadPool executors** to support multiple IO operations.
  - Maintained SQL and NoSQL databases in the **master-slave** mode to increase the **reliability** of the system.
  - Onboarded marketplaces like **Amazon Marketplace (SmartConnect and Seller Party models), CloudTail (Vendor APIs)**, and logistic partners like **Amazon Shipping Provider (Shipping APIs).**
- **Integration of Event-driven Architecture using Amazon Web Services**
  - Integrated **EventBridge** to receive **events** from **downstream systems** and route them to target **Simple Queue Service (SQS)**, thereby reducing API calls by **25%** and increasing efficiency of system by **30%.**
  - Used **CloudWatch metrics** to monitor the health of the various **SQSs** and notify on critical events.
- **Visualized system metrics using Elastic Search** *[Video]*
  - Added **Filebeat** on the Integration proxy layer for forwarding log data to a **centralised Logstash server**, which processed the data from various clusters and passed them to **ElasticSearch instances.**
  - Set-up **Kibana** to visualize the ElasticSearch data for each metric and created **Visualization charts** to monitor the different metrics. This helped in reducing the oncall ticket count by **15%.**
- **Dynamic Obstacle avoidance for Self-Driving Car** *[Github]*
  - Implementing **LSTM** and **conformal prediction** for pedestrians' and cars' dynamic **trajectory prediction.**
  - Using the prediction, planning the car's **optimal path** using **MPC.**

## LEADERSHIP EXPERIENCE

- **Unicommerce eSolutions Pvt. Ltd.** Gurugram, India  
*Team Lead*  
*Dec 2021 - July 2022*
  - Reviewed the works of my team members, set up best coding practices and held tech sessions with team members for each assigned tasks. Also, mentored the members of the team for the various tasks.