# Harshdeep S.

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## Education

**Arizona State University (Ira A. Fulton School of Engineering) –** *M.S. in Computer Science* | *GPA: 4.0/4.0* May 2024
**University of Delhi (Netaji Subhas Institute of Technology) –** *B.E. in Computer Science* | *GPA: 8.2/10* May 2021

## Technical Skills

**Languages**: Python, Java, C/C++, Javascript, Scala, Typescript, Go, Kotlin, C#, , HTML, CSS, SQL, Git, clingo, LaTeX
**Technologies**: Springboot, Tensorflow, Pytorch, Docker, Apache Spark, Apache Kafka, AWS, D3.js, GraphQL, Android, React.js, Angular, jQuery, Next.js, LangChain, Jenkins, Redis, Apache Sedona, FastAPI, Vector DBs, MongoDB, Firebase, Kubernetes, MS Azure, .NET, Node.js

## Experience

**Research Assistant (ML/AI)** March 2023 – May 2024
*Lab V2 @ Arizona State University* *Tempe, AZ*

- Developed machine learning models to forecast commodity prices, enhancing model performance further by 1-2% using EDCR technique, a neuro-symbolic approach.
- Achieved 2X precision in identifying spoofed AIS data in ships using attention-based deep learning models built with *PyTorch*.
- Managed and pre-processed 10TBs of AIS data utilizing *Hadoop*, *PySpark*, *AWS S3* and *AWS EMR* for feeding ML models.

**Software Engineer** July 2021 – July 2022
*Expedia Group* *Gurugram, Haryana*

- Engineered Tier 1 *Java Spring Boot* microservices, enabling seamless payment processing for 50M Expedia customers.
- Implemented fine-grained auth using Google's *Zanzibar* on a *gRPC* microservice, resulting in a reduction in unauthorized access to user data.
- Spearheaded effort to set up monitoring dashboards with *Datadog* and *Splunk*, reducing time to detect & resolve incidents by 60%.
- Optimized notification system by implementing *Apache Kafka, Apache Storm, and Redis cache*, boosting user engagement by 40% and enhancing booking communications for increased customer satisfaction and loyalty.
- Rebuilt batch jobs consuming terabytes of data utilizing *Apache Spark*, *AWS EMR* and *AWS Data pipeline* to drastically reduce execution time by six-folds and decrease execution cost by 50%.
- Leveraged technologies such as *AWS EMR*, *AWS Datapipeline*, *Qubole*, *AWS Kinesis* to run ETL processes that drove business analytics tool.

**Founder/Developer (Part-time)** July 2019 – July 2021
*XanderApps* *Remote*

- Conceptualized, developed, and launched a Java Android app with MVC, replicating notification LED functionality, amassing over **5M+ downloads and user base of 200K+ weekly users**.
- Efforts were recognized by **XDA** and **Android Authority** for innovation and impact.
- Owned full software development life-cycle, managing planning, UI/UX, testing and deployment.
- Integrated CI/CD using Bitrise, ensuring seamless updates and quality assurance reducing time to production by one-third.
- Actively incorporated user feedback, resulting in the introduction of new features that increased user retention by 20%.

**Software Engineering Intern** May 2020 – July 2020
*Expedia Group* *Remote*

- Delivered an end-to-end virtual agent system using *Python*, *FastAPI*, and NLP techniques, achieving a 95% accuracy rate in recognizing customer queries.
- Utilized *FastAPI*'s async architecture & *AWS DynamoDB* to create scalable backend service with an SLA of 300ms.

## Projects

**RAGbot: Simplifying PDF Navigation with Chat** | *Python, LangChain, Qdrant, React, FastAPI, Docker*
Revolutionized PDF navigation by employing *LangChain*, *Ollama*, *Qdrant* vector DB, and *FastAPI* for web service. Integrated *React.js* frontend for seamless user experience. Utilized local version of *Llama3* LLM for intuitive chat-based PDF exploration.

**Reinforcement Learning in Pacman** | *Python, AI, RL*
Implemented and leveraged reinforcement learning methodologies, specifically employing Approximate Q-learning and True Online SARSA algorithms, to enhance performance of Pacman game in a Python-based project increasing average score by 20%.

**Disaster Management Dashboard** | *Javascript, React, D3.js*
Constructed a visualization dashboard employing *React.js*, *Redux.js*, and *D3.js* to assist first responders in disaster management by creating novel plot representations from scratch. Project served as a plausible solution for VAST 2019 MC1.