

## Summary of Qualifications

- 5+ years of strong experience in developing high-performance systems, message-oriented middlewares, microservices, and secure, low-latency APIs using Java, Python, RabbitMQ, PostgreSQL, Elasticsearch, AWS, Docker Swarm and Ansible.
- Demonstrated experience in working with databases and raft-based distributed transactional systems. Deep understanding of distributed systems principles, consensus protocols, database systems, concurrency, and general computer science fundamentals.

## Education

2021 – Now **Master of Mathematics in Computer Science**, *University of Waterloo*, Waterloo, Canada



Thesis work: "Eventual Durability of Transactions in Database Systems" under Dr Ken Salem.  
Course average – 93.25%

2014 – 2018 **Bachelor of Engineering in Computer Science**, *Christ University*, Bangalore, India



3.93 GPA, Graduated top of the class with a gold medal.

## Work Experience

2021 – Now **Graduate Research Student**, *University of Waterloo*, Waterloo, Canada

- Thesis work is on "Eventual Durability (ED)" of transactions. We introduce a principled way to manage durability trade-offs in ACID-based transactional systems, and allow transactions to commit first, but become durable eventually.
- Fully implemented ED in [PostgreSQL](#) by modifying its transaction manager. Also implemented an initial ED model in [CockroachDB](#) by modifying its transaction layer, raft (consensus) layer and storage layer.

2020 – 2021 **Senior Software Engineer**, *ARTPARK*, *Indian Institute of Science*, Bangalore

- Led a team of four engineers, and closely collaborated with engineering teams and start-ups in architecting, developing and deploying a service that identified Covid-19 from chest X-Ray images. This platform garnered national attention in India and was featured in major news networks like [NDTV](#), [CNBC-TV18](#) and [India Today](#).
- Spearheaded, and actively contributed to three noteworthy projects while managing timelines, delegating responsibilities and performing code reviews:
  - a) A scalable, low-latency middleware for data exchange built using a Java and RabbitMQ based tech-stack.
  - b) A low-latency, near-real-time video server with robust authentication and authorisation built using the NGINX RTMP module.
  - c) A confidential computing platform built on top of AWS Nitro Enclaves to enable private data exchange with strong cryptographic guarantees.
- Worked with senior engineers to jointly develop good coding guidelines and version control best practices for the team.

2018 – 2020 **Technical Associate**, *Indian Institute of Science*, Bangalore

- Worked extensively on developing high-performance IoT middlewares capable of ingesting data from IoT devices and routing them to downstream subscribers. Used Java, Python, Go, Docker, Docker Swarm, RabbitMQ, LDAP, Elasticsearch, PostgreSQL, NGINX, Digital Ocean and Ansible.
- Managed a team of four engineers to develop a COVID-19 data pipeline that ingested data and provided recommendations to the government for targeted testing. Collaborated with government agencies, senior volunteer engineers, start-ups, and teams from other Indian Institutes.
- Handled multiple responsibilities, including translating user requirements into features, overseeing feature deliveries, and delegating responsibilities while also actively contributing to projects.
- Worked on developing an ETL pipeline for the Indian Urban Data Exchange ([IUDX](#)) to ingest, process and feed data from smart city sources into the IoT middleware we developed. IUDX is now deployed in 35 major Indian cities.

## Internships

### Winter 2017 Intern, Middleware Security, *Indian Institute of Science, Bangalore*

- Developed an “Intrusion Detection and Prevention System” for an IoT middleware platform that was capable of preventing DoS attacks and some kinds of exploits. Built using Fail2ban, Python, Ansible, GoLang and Lua.

### Summer 2017 Intern, Database Systems, *Indian Institute of Science, Bangalore*

- Thoroughly evaluated various NoSQL databases for the high-throughput needs of an IoT middleware.

## Skills

- **Languages:** Java, Python, SQL and C.
- **Databases:** PostgreSQL, CockroachDB, Elasticsearch, MongoDB.
- **Tools:** Docker, Docker Swarm, RabbitMQ, Redis, Ansible, Jenkins, Travis, Git.
- **Platforms:** AWS and DigitalOcean.
- **Others:** Distributed systems, consensus protocols, backend systems, system architecture, REST APIs, networks, message queues, microservices, engineering and coding best practices.

## Teaching Experience

- Teaching Assistantships at the University of Waterloo:
  - Operating Systems: Winter 2022, Spring 2023 and Fall 2023.
  - Designing Functional Programs using Racket: Fall 2021.
- Taught a module “Database Systems and Scaling Strategies for IoT middlewares” as a part of “Foundation Courses on Micro, Nano and Smart Systems” at the [Indian Institute of Science](#).
- Held a three-day workshop on Android Application Development for high school students at a National Science Museum.

## Some Achievements

- 🏆 Invited to attend the highly selective workshop on “Data Management Techniques” organised by Götz Graefe (Google, WI) at Schloss Dagstuhl, Leibniz-Zentrum für Informatik, Wadern, Germany.
- 🏆 Received the International Masters Award of Excellence scholarship along with full funding to pursue MMath CS at the University of Waterloo.
- 🏆 Co-authored four [Bureau of Indian Standards](#) documents on smart city reference architecture and APIs – Unified Digital Infrastructure – ICT Reference Architecture (UDI-ICTRA) IS 18000 : 2020, Unified Digital Infrastructure – Data Layer Part 1 Reference Architecture IS 18002 (Part 1) : 2021, Unified Data Exchange Part 1 Architecture IS 18003 (Part 1) : 2020, Unified Data Exchange Part 2 API specifications IS 18003 (Part 2) : 2021.
- 🏆 Won a paid trip to RabbitMQ Summit 2019 in London – sponsored by [CloudAMQP](#) and the Indian Institute of Science to talk about using RabbitMQ in production.
- 🏆 “Outstanding Academic Performer” award, conferred by Christ University for academic achievements during the undergraduate program.
- 🏆 Recipient of Merit Scholarship for two consecutive years 2016-18 conferred by Christ University.