Shristi Raj

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Education

Indian Institute of Technology BHU, Varanasi **Jul. 2016 – Jun 2020**
Bachelor of Computer Science & Engineering *Cumulative GPA: 9.85/10*

Experience

Qube Research & Technologies **Feb 2023 – Jan 2025**
Quantitative Developer - LPXD Desk *London, UK*

- Part of the core team for a greenfield project, co-developing a high-performance distributed data server using ClickHouse, Apache Arrow, gRPC, and Rust achieving 20x speed improvements, enhanced scalability against legacy Python-based distributed data server (REST/WebSockets, PostgreSQL, Pandas, Msgpack, Redis) for quantitative research.
- As part of LPXD-RAD Team (Equities desk at QRT), responsible for designing, developing and scaling data and performance analytics applications to support portfolio & strategy management in collaboration with research teams to develop and test quantitative performance metrics.
- Developed daily performance metrics reports for global signals across 15K securities, leveraging 410 financial factors and ROI data tailored to in-house trading universes. Enabled the researchers to assess signal effectiveness before trading hours, improving decision-making and strategy calibration.
- Implemented OpenTelemetry tracing across legacy and new data servers, integrating Amazon Timestream and Prometheus, improving debugging efficiency by 60% and reducing incident resolution time for high-throughput.
- Analyzed system overload patterns and introduced throttling mechanisms, optimizing resource allocation and ensuring consistent uptime during peak loads.
- Managed an intern on a project to decouple individual access authentication from the distributed server, later improvising it to include RBAC based on group membership and manager-subordinate relationships. This streamlined access management, reduced authentication latency by 30%, and ensured private access to alphas and data sources.
- Proposed and designed an intern project for 2025 to modernize metadata management by migrating data source configurations from Alembic versioned config files to a DynamoDB-backed catalog, enhancing update efficiency and streamlining new data source integration

Smarkets **Jul 2022 – Jan, 2023**
Mid Level Software Engineer *London, UK*

- Platform Engineer on Edge Team, responsible for the design, development, and maintenance of critical components in the data pipeline and pricing engine, ensuring seamless integration and scalability for real-time pricing and market data systems. Tech Stack: Python, Rust, PostgreSQL, Kafka, Redis, Kubernetes.
- Designed and developed end-to-end infrastructure to onboard a new data source, enabling real-time Kafka streams for pricing and live market feeds. Applied fuzzy string matching to clean & structure misformatted event data, improving accuracy and efficiency. This resulted in a 30% increase in revenue and user acquisition by adding more markets, enhancing the trading experience.
- Migrated pricing engine from REST to gRPC, achieving a 10x performance improvement by enabling low-latency, scalable microservices for real-time pricing updates, while automating class generation and implementing strongly-typed schemas, which streamlined inter-team collaboration, accelerated development, driving efficiency.

D.E. Shaw & Co. **June 2020 – June 2022**
Software Engineer, Front Office Tech *Hyderabad, India*

- As a member of Market Data Feeds team, under R&D Tech division, working on building system that supports real-time, low-latency data-feed infra. My responsibilities include interaction with multiple teams, developing quarterly plans, alongside design, development, testing & deployment.
- POC for 100% EMEA direct feed parsers and responsible for handling all their Exchange driven changes. Worked on low-latency parsers development for EURONEXT, SIX SWISS which uses FIX SBE protocol.
- Co-developed a low-latency, conflated market data feed service using Apache Kafka and multithreading, implementing an efficient snapshot mechanism to normalize price and volume updates at configurable intervals (1s, 5s, etc.), improving scalability and accuracy for high-frequency trading and research.
- Worked on analysing 15 years of market tick data from major China exchanges for the Equities group to back-test their strategies on daily price limits fluctuation and deployed the LimitUp and LimitDown rules in trading.
- Owned primary data source used for real-time HF trading applications in C++ & Java. Made it more robust by analyzing data and resolving issues to narrow down maintenance & operational cost by 70%, attracting usage against other sources, estimated to save around $100k annually.

- Developed centralized scalable framework to collect vast archives of data-sets in a very efficient, optimized and seamless manner in Python. Currently being used for 100+ quantitative analysis projects with few in real-time analytics.
- Eligible for **promotion to Senior Member of Tech** after 2 years due to significant contributions to high-impact, production-critical projects. Chose to pursue a new opportunity before promotion.

Goldman Sachs **May 2019 - July 2019**

Software Engineering Internship - Offered full-time Role in team *Bengaluru, India*

- Developed UDP Pcap Recorder-Replayer in C++ for Market Data which records the incoming packets from the exchanges, dumps them to pcap files for future storage. Once required for regression, implemented a light weight replayer which replays the packets in the ASCII messages. Deployed to production for regression testing. Concluded to save their storage DB by 50% space as replaced ASCII files with the binary pcap formatted files in the cheap storage.
- Completed 8 weeks work in 6 weeks with deployment so worked on aligning reference data streams with their market data, eliminated heavy template based encoders and decoders in C++ with python generated fields which decreased Complexity of Existing Environment.

Research

Database Management Lab, IIT BHU | *C Ravindranath Chowdary* **January 2019**

- Worked on a model to recommend possible research peers to a user efficiently by modelling all the authors along with their attributes as an attributed graph and then perform community search on this attributed graph to find the most appropriate peer for a user.
- Successfully published an article on our research -Raj, S., Sharma, P., Kumar, C. et al. Peer recommendation by using pattern mining to generate candidate keywords in attributed graphs. Sādhanā 48, 70 (2023).

Science Academies' Summer Research Fellow | *Indian Academy of Sciences* **May 2018 - July 2018**

- Worked on a kernel density estimation based deep learning approach for real-time classification of events in a power system. Designed Multilayer Perceptron (MLP) network for multiclass softmax classification in Keras to optimize the classification task.
- IEEE Publication: Real-time Event Classification in Power System with Renewables using Kernel Density Estimation and Deep Neural Network. In IEEE pages 6849 - 6859.

Relevant Skills

Languages: Python, C++, Bash, Rust, Perl, SQL, HTML
Developer Tools: NumPy/SciPy, Pandas, Apache Arrow, Dask, Docker/Kubernetes
Technologies/Frameworks: Clickhouse, Jenkins, GitHub, Kafka, Prometheus, AWS
Soft Skills :Problem-Solving, Analytical Thinking, Adaptability & Continuous Learning, Time Management & Prioritization, Proactive Stakeholder Engagement, Collaborative Teamwork, Technical Writing

Relevant Coursework

- Data Structures
- Machine Learning
- Algorithms
- Database Management
- Artificial Intelligence
- Operating System
- Networks
- Computer Architecture
- Mathematical Modelling

Positions of Responsibility

• **Interview Panelist - QRT** Led technical screening and in-house interviews for full-time roles with LPXD QD Team.
• **Question Curator & Interviewer - DE Shaw India** for Tech Campus Recruitment Team.
• **Panel Member** for interviewing 140 candidates for KAF 2022 merit based scholarships as an alumni of IIT BHU.
• **Teaching Assistant** for Introduction to Computer Programming and Linux.
Institute Student Mentor to guide freshmen focusing on academic and holistic development.
• Member of the IIT BHU Athletics Team, won Bronze in Spardha 2017.
• Selected for **Microsoft Codess'18 Meet**, went to Hyderabad campus visit and got the opportunity to network and hear from a panel of senior technical women. Participated in the product hackathon mentored by Microsoft engineers. Organized four teams for a summer project mentored by Microsoft Engineers, led one of them, and managed the communications and meetings between mentors and students.

Awards

• IIT BHU 2021 Gold Medalist for achieving a CPI of 9.85/10.0 GPA.
• Finalist at LinkedIn Wintathon 2020, one of 60 out of 3300 applicants.
• Scholarship to attend the Grace Hopper Celebration of Women in Computing Conference in 2019.
• Received National & Summer Research Fellowship from IAS, INSA or NASI in 2018.
• Received IIT BHU & Kasi 1981 Merit-Cum-Means Scholarship twice in 2017 and 2018.
• Secured the top 0.1 % percentile among 1.8M candidates in IIT-JEE Advanced and JEE Mains Examination 2016.