

ANIMESH JHA

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Academics

Computer Science and Engineering (B.Tech)

Indian Institute of Technology (IIT), Kharagpur

Class XII, Central Board of Secondary Education

Amity International School, Saket, Delhi

2019 - 2023

9.76/10.0

2019

96.2 %

Internship and Research Experience

Rubrik, Inc.

May 2022 – July 2022

Software Engineering Intern – Platform Team

Bangalore

- Migrated datapipelines handling **10+TB** per day from AWS EMR to Kubernetes using the Spark Operator for Kubernetes
- Setup observability and monitoring for production deployment; Pushed all container logs to CloudWatch and S3 via FluentBit
- Collected job and cluster metrics via Prometheus and created Grafana dashboards to analyse and improve resource utilisation
- Increased number of bundles processed per hour by **35%** reduced the EC2 compute cost by **40%** and overall cost by **67%**

Secure and Byzantine Resilient Non-Convex Optimisation

December 2021 – Present

With Prof. Simon Du

University of Washington

- Designed and analysed Byzantine Fault Tolerant algorithms for efficient Distributed Non Convex First Order Optimisation
- Established lower bounds on the number of iterations for finding ϵ approximate saddle points in the presence of adversaries
- Analysing how such algorithms can be used for Federated Learning with secure aggregation, using Zero Knowledge Proofs

Communication Efficient Federated Learning

May 2021 – August 2021

With Prof. Jihong Park

Deakin University

- Improved communication efficiency of Federated Learning by reducing model sizes via sparsification using their lottery tickets
- Used supermasks to prune server-side models, reducing the model size while maintaining accuracy and client-side data privacy

Autonomous Ground Vehicle Research Group

March 2020 – September 2021

With Prof. Debashish Chakravarty

IIT Kharagpur

- Implemented local Frenet Frame pathplanner. Achieved **5x** decrease in latency via OpenMP and memory access optimisations
- Participated in the Indy Autonomous Challenge. Created optimal racelines and a novel vehicular Model Predictive Control
- Created complex models suitable for high speeds with provisions for overtaking and drafting. Tuned to racetrack conditions
- Created DL model for generating interaction-aware trajectory predictions. Extracted features using GCNs to reduce latency
- Used LSTMs to generate trajectories using GCN features. Outperformed the state of the art model on Apolloscape by **10%**

Publications

Local NMPC on Global Optimised Path for Autonomous Racing [PDF] [Code]

OCAR Workshop ICRA 2021

[Re]: Differentiable Spatial Planning using Transformers [PDF] [Code]

MLRC 2021 Fall

[Re]: Contrastive Learning of Socially-aware Motion Representations: [PDF] [Code]

MLRC 2021 Fall

Projects

Resource Efficient Domain Specific QA | Inter IIT Tech Meet 11 – Silver (Team Captain) | [Report] | [Code] **Feb 2023**

- Combined sentence level context retrieval with an ensemble of noisy tuned LLMs with contrastive loss to extract answer span
- Achieved low latency via ONNX, Caching and Quantization. Experimented with MAML for efficient domain adaptation

Bosch Model Extraction for Video Transformers | Inter IIT Tech Meet 10 – Gold | [Code]

March 2022

- Performed model extraction attack on Swim-T and Movinet in greybox setting by a MARS model trained on augmented data
- Used DFME with Conditional GAN and adversarially generated synthetic examples (via perturbation) in the blackbox setting

Custom Shell and Memory Management Library | OS Lab Project | [Code]

February – March 2022

- Created custom shell with piping, redirection, history, background jobs, auto-complete (using automaton) and multi-watch
- Built a custom memory management library in C++ using implicit freelists with paging, garbage collection and compaction

Discord Bot for Quizzing | Personal | [Code]

June 2020

- Created a bot to make online quizzing easier. Helped the Quiz Club to continue during the pandemic, used by 100+ quizzers
- Used Discord.JS to implement features like scoreboard and buzzers and to automate delivery of messages to individuals

Achievements

- Secured All India Rank **60** in the **Kishore Vaigyanik Protsahan Yojna** (SA, 2017) conducted by the Government of India
- Awarded the **National Talent Search Examination Scholarship** (2017) by the Government of India.
- Secured All India Rank **539** amongst 1.3 million students in JEE Mains 2019. All India Rank **843** in JEE Advanced 2019.
- **National Finalist** (amongst the top 5 teams out of 25000+ participants) at the **Uber Hacktag 1.0 2021**.
- Part of the **Bronze** winning Inter IIT Tech Meet Contingent 2021, in Automatic Headline and Sentiment Generator Event.
- Member of the **Gold** winning Quiz Team and contingent of IIT Kharagpur in 4th Inter IIT Cultural Meet 2019.
- ACM ICPC Regionalist: Qualified for and placed **44th** out of 7000+ teams at the Gwalior Pune ICPC Regionals 2020.

Technical Skills

- **Languages:** C++, C, Python, \LaTeX , Scala, Verilog, Java, JavaScript
- **Libraries:** OpenMP, Eigen, Selenium, BeautifulSoup, Pandas, Flask, PyTorch, Scikit-Learn, HuggingFace, Numpy, Jax
- **Tools:** Git, RTI, ROS, Terraform, Bazel, Docker, Kubernetes, AWS, Azure, Heroku, Spark, Snowflake, Kafka, Blender

Relevant Coursework

Algorithms 1&2* | Discrete Structures | Software Engineering* | Probability and Statistics | Theory of Computation | Signals and Networks* | Compilers* | Linear Algebra | Computer Architecture* | Computational Number Theory | Operating Systems* | Machine Learning | Deep Learning | Cryptography | Randomised Algorithm Design | Distributed Systems (*with Lab)