Ankush Arora

+91 945 691 6921 | nkusharoraa@gmail.com |
in/nkusharoraa | nkusharoraa | nkusharoraa.github.io

Education

Indian Institute of Technology Delhi — Hauz Khas, New Delhi, India
B.Tech. in Mechanical Engineering — *July 2019 – June 2023*
GPA: 8.55/10.00

Areas of Interest

Supply Chain Management: Demand Forecasting, Inventory Management, Warehousing, Network Design, Production Planning, Logistics Management, Sourcing and Shoring, Procurement, Process Analytics, INCO terms.
Engineering: Mechanical Design, Vehicle Dynamics, Steering Systems, Motion Simulation, DFMEA, Multi-body dynamics, Manufacturing System Design, Game Theory, DSA, Stochastic Modeling, Simulation Optimization.

Industry Experience

Bajaj Auto Limited — Akurdi, Pune, Maharashtra, India
Assistant Manager, Steering Systems, Vehicle Design, Research and Development — *July 2023 – Present, Full-time*

- Theoretically evaluated Kingpin Moment for 4 Wheeler and compared with the Testing Data to analyse steering torque hysteresis loop formation, closing in on testing average within 5.8% range of the estimated effort.
- Related Kingpin Moment to Steering Wheel Effort having a rack and pinion arrangement, and estimated Steering Wheel Returnability close to the angle achieved till 3 seconds in physically testing the vehicle.
- Compared Roller Chassis Dynamometers using Levene's test on absolute differences in *python* using CAN loggers.
- Attained Geometric Dimensioning and Tolerancing (GD&T) training for practical designing of vehicle parts
- Introduced variety reduction of bolts by 12% on the basis of close class, across flat and application.

Colonist LLC — United States (Remote)
Quality Assurance Tester — *April 2023 – June 2023, Part-time*

- Performed end-to-end testing on colonist.io, an online board game platform with millions of active users, to identify and report software defects, ensuring the smooth functioning of the platform.
- Collaborated with developers and designers to provide feedback on game mechanics, user interface, and quality.

Research Experience

McGill University — Montréal, Québec, Canada
Undergraduate Researcher — *May 2022 – July 2022, Internship*
Guide: Prof. Adam Hendricks, Department of Bioengineering, McGill University

- Ventured Cell Culture and Western Blotting for detecting huntingtin protein concentration for COS-7 lysate.
- Scaled the antibody coupling step by 2.5 to get 1.25 mg coated magnetic beads; optimizing immunoblot analysis.
- Documented the protocol for sample preparation illustrating the precautions focusing 80% confluent P100 of cells.

National Tsing Hua University — Hsinchu, Taiwan (Remote)
Undergraduate Researcher — *June 2021 – July 2021, Part-time*
Guide: Prof. Lee-Wei Yang, Inst. of Bioinformatics and Structural Biology, National Tsing Hua

- Employed the use of Visual Molecular Dynamics to attain energetically stable positions of any protein structure.
- Implemented Kabsch Algoritm lowering RMSD by 7% for superimposition of the new structure.

Awards & Achievements

MITx MicroMasters: Successfully passed (DI) the SCM MicroMasters affiliated to MIT (Massachusetts). [2023-2024]
MITACS GRI: Selected among top 1% for undergraduate research in Canada with 10000+ eligible applicants. [2022]
Teaching Assistant at IIT Delhi: Offered Teaching Assistantship on merit basis for a course of 400+ students. [2022]
Department Change at IIT Delhi: Secured department change among top 9% in a batch of 1000+ students. [2021]
Joint Entrance Examination: Secured All India Rank 67 in JEE Main Paper II. [2019]
Joint Entrance Examination: Secured top 0.2 percentile in JEE Main & Advanced with 1M+ candidates. [2019]

Projects

Demand Forecasting Using Time Series Analysis and Exponential Smoothing |
Guide: MITx Micromasters in Supply Chain Management *March 2024 – April 2024*

- Improved accuracy in demand forecasting leading to optimized inventory management and reduced stockouts.
- Enhanced decision-making capabilities for supply chain planning and resource allocation using time-series analysis.

Advanced Inventory Management |
Guide: MITx Micromasters in Supply Chain Management *April 2024 – May 2024*

- Optimized inventory levels leading to reduced holding and ordering costs.
- Improved service levels, reduced stockouts and developed procurement strategies, enhancing customer satisfaction.

Transportation Mode Selection Tool |
Guide: MITx Micromasters in Supply Chain Management *May 2024 – June 2024*

- Programmed tools and models related to transportation management to select the best mode of transport.
- Covered inputs of mode selection, lead time variability, transportation operations, economic modes, and constraints.

Discrete Simulation Optimization Package Development |
Guide: Prof. Varun Ramamohan, Department of Mechanical Engineering, IIT Delhi *August 2022 – May 2023*

- Engineered a Python package using simulation-based algorithms for optimizing hyperparameters in ML models.
- Implemented Stochastic Ruler, and Ranking and Selection methods in MLP, SVM, and Random Forest models.
- Through rigorous t-tests, showcased superior performance of SR over Hyperopt TPE in the breast cancer dataset.
- Automated the Adaptive Hyperbox Algorithm (AHA) local search for simulation optimization problems.

Segregated Distribution of Variable Length Boxes on Different Conveyors |
Guide: Prof. Sunil Jha, Department of Mechanical Engineering, IIT Delhi *October 2022 – November 2022*

- Demonstrated expertise in Programmable Logic Control and Electro-Pneumatics logic.
- Utilized Sequential Function Chart coding and *Automation Studio* for speed offset slider and dynamic box-type.

Calibrator level Optimization for Clinical Immunoassays using Simulation
Guide: Prof. Varun Ramamohan, Department of Mechanical Engineering, IIT Delhi *June 2021 – August 2021*

- Explored the solution space for an inverse log-logit function calibrated over 4 parameters.
- Utilized 95% confident Gaussian Haptoglobin concentrations to give the least uncertain medical decision points.

Petroleum Refinery: Processes Impact and Design Aspects
Guide: Prof. Krishnakant Agarwal, Department of Mechanical Engineering, IIT Delhi *April 2021 – May 2021*

- Documented a Literature Review of the primary functionalities in petroleum refineries and energy economics.
- Implemented a Refinery Linear Program to compute the margin maximizing crude and product slate.

Improvised Vending Cart
Sponsor: Ministry of Science and Technology *December 2021 – January 2022*

- Prototyped the fabricated Vending Cart with economically minimal feature addition for attraction and hygiene.
- Designed the Lift & Turn mechanism for 500 kg loaded cart incorporating a mechanical advantage of 67.

Graphene Nanosheet: Nanomechanical Properties Analysis
Guide: Prof. Devendra Dubey, Department of Mechanical Engineering, IIT Delhi *October 2021 – December 2021*

- Determined Young's Modulus of graphene for different loading directions, highlighting its anisotropic properties.
- Investigated the effects of domain size, initial crack length, and lattice orientation on graphene's yield stress.

Extra-Curricular Activities

Representative | Literary Club | Board For Recreational and Creative Activities, IIT Delhi: [2020-2021]
∘ Organized 4 national & 7 institute level events with 500+ participant; organized workshops for 250+ freshmen.
Representative | Content Team | Alumni Affairs and International Programs, IIT Delhi: [2020-2021]
∘ Mapped 6 newsletters to 10000+ alumni globally accompanying monthly interviews.
Winner, as the author, Inter-hostel Script Writing Competition, among 13 hostels, Dramatics Club IIT Delhi. [2020]
Runner Up, as the director, Inter-hostel Film Making Competition, among 13 hostels, Dramatics Club IIT Delhi. [2021]
Winner, as the house Kilinda, House Trophy of the Literary Club, among 13 hostels for two consecutive years. [2021]
Runner Up, as a team of 3, Inter-hostel Chess Competition, IIT Delhi. [2019]