

Ankush Arora

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EDUCATION

Indian Institute of Technology Delhi

B.Tech. in Mechanical Engineering

GPA: 8.55/10.00

Hauz Khas, New Delhi, India

July 2019 – June 2023

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

Assistant Manager, Steering Systems, Vehicle Design, Research and Development

Akurdi, Pune, Maharashtra, India

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

Quality Assurance Tester

United States (Remote)

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

Undergraduate Researcher

Montréal, Québec, Canada

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

Undergraduate Researcher

Hsinchu, Taiwan (Remote)

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 Algorithm 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]