

# Tanya Gupta

Indian Institute of Technology, Bombay

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I am interested in solving solid mechanics problems using numerical computations. On a broader perspective, I am passionate about resolving practical problems using principles of engineering. I am also fascinated by prototype manufacturing and algorithm designing.

## Education

- 2015-Present **Indian Institute of Technology, Bombay.**  
B.Tech + M.Tech Dual Degree in **Mechanical Engineering** with specialisation in Computer Aided Design and Automation and Minor in **Computer Science** Overall CPI - 8.53/10.00.
- 2013-2015 **Intermediate/+2, PACE Junior Science College, Borivali** Percentage - 96.92.
- 2013 **Matriculation, Vibgyor High School, Goregaon** Percentage - 96.00.

## Scholastic Achievements

- **All India Rank 1889** in Joint Entrance Examination (Advanced) 2015, among 150,000 candidates.
- **All India Rank 166** in Joint Entrance Examination (Mains) 2015, among 1.2 million candidates.
- Awarded the **Maharashtra State Gunwan Vidhyarathana Aarthik Sahaya** scholarship, which is aimed at encouraging students who have done well in the intermediate board examinations
- Secured 5th rank overall, 1st rank among girls in Common Engineering Tests in Maharashtra
- Achieved **rank 1 in Mumbai** in Higher Secondary Certificate Board Examinations
- Changed branch from Civil to Mechanical engineering owing to exceptional academic performance
- Bagged **Maharashtra Rank 8** in National Science Olympiad
- Acquired **International Rank 36** in International English Olympiad

## Standardized Tests

- GRE® Score: **328/340** (Quantitative: 170/170, Verbal: 158/170, Writing: 4.5/6)
- GMAT™ Score: **740/800** (Quantitative: 51, Verbal: 38, Writing: 6/6, Integrated Reasoning: 6/8)
- TOEFL® Score: **115/120** (Reading: 29/30, Listening: 30/30, Speaking: 26/30 Writing: 30/30)

## Key Courses

- Mechanical** Manufacturing Processes I and II, Solid Mechanics, Fluid Mechanics, Microprocessors and Automatic Control, Thermodynamics, Data Analysis and Interpretation, Applied Thermodynamics, Heat Transfer, Advanced Heat Transfer<sup>†</sup>, Kinematics and Dynamics of Machines, Machine Design, **Manufacturing Automation, Rapid Product Development**
- Computer** Computer Programming, Data Structures and Algorithms, Design and Analysis of Algorithms, Machine Learning, Computer Networks, Principles of Data and System Security<sup>†</sup>
- Mathematics** Calculus, Differential Equations, Linear Algebra, Discrete Math, **Stochastic Processes**
- Applied Math** **High Performance Scientific Computing<sup>†</sup>**, Introduction to Numerical Analysis, **Computational Fluid Dynamics, Computer Aided Simulation of Machines<sup>†</sup>**
- Certifications** Bloomberg Market Concepts, IIT Bombay Finance Bootcamp, KPMG Lean Six Sigma Green Belt, Thomson Reuters Eikon 4, Certified Marketing Analytics Practitioner

<sup>†</sup> to be completed by May 2019, **electives outside core curriculum**

## Academic Projects

### Box Transport Mechanism, *Computer Aided Simulation of Machines* [Spring '19]

Supervisor: [Prof. Anirban Guha](#), Department of Mechanical Engineering

- Simulated the **displacement, velocity and acceleration profiles** of the 8 bar box transport mechanism
- Modeled the mechanism in **ADAMS Software** and performed sensitivity and joint clearance analysis
- Performed **static** and **dynamic force** analysis to understand motion of the output component
- Submitted an extensive report containing the observations and results, currently discussing a working prototype

### Design and Fabrication of a Foldable Helmet, *Machine Design* [Autumn '18]

Supervisor: [Prof. Parag Tandaiya](#), Department of Mechanical Engineering

- Designed a motorcycle helmet with reliable **collapsing mechanisms** for volume reduction during storage
- Created a telescoping model on **Autodesk Fusion 360** and, used **ATOM** (Abaqus Topological Optimization Module) for structural optimization and material reduction in the model
- Manufactured the prototype by 3D printing in **ABS**, assembled the final helmet and displayed it in the Trade Show with **prototype demonstration** and **poster presentation**
- Currently **discussing patenting** the design with the Industrial Design Centre at IIT Bombay

### Scott Russell Mechanism, *Rapid Product Development* [Autumn '18]

Supervisor: [Prof. K P Karunakaran](#), Department of Mechanical Engineering

- Designed a **3-axis CNC machine** using Scott Russell mechanism for **combining Y-Z axis** on the table
- Created CAD Model after several design iterations to get the most efficient model
- Inspired by the **Kappa 3D Printer**, did kinematic analysis for motor control along the two axes
- Used **MATLAB** to **plot the envelop** which can potentially be covered by the machine

### Production Line in Small Scale Industries, *Manufacturing Automation* [Spring '18]

Supervisor: [Prof. K P Karunakaran](#), Department of Mechanical Engineering

- Conducted **extensive floor survey** of a small-scale manufacturer and designer of kitchen equipments and exhaust systems for restaurants to identify scope for automation
- Recommended optimized costs based on use of machines, labor, time and floor space
- Owner implemented suggestions leading to effective **space utilization, improved finishing & increased productivity**

### Black Scholes Merton Model, *Financial Economics* [Spring '18]

Supervisor: [Prof. Puja Padhi](#), Department of Humanities and Social Sciences

- Delved deep into the **2008 financial crisis** and presented an extensively detailed synopsis of Michael Lewis' The Big Short by explaining the **subprime mortgage crisis**, the **housing bubble** and **fraudulent underwriting**
- Understood derivation by doing extensive literature survey from research papers and reference books
- Presented my findings to a group of 40 students, modified the model for **currency pair option derivatives**

### Handwriting Recognition, *Introduction to Machine Learning* [Autumn '17]

Supervisor: [Prof. Preethi Jyothi](#), Department of Computer Science and Engineering

- Compared prediction accuracy of **logistic regression, multilayer perceptrons** and CNNs on MNIST database
- Evaluated the dependence of classifier performance on **pre-processing techniques** like fourier transform
- Computed **confusion matrix** for error identification and verifying accuracy

### Othello Game AI Implementation, *Data Structures and Algorithms* [Spring '17]

Supervisor: [Prof. Ganesh Ramakrishnan](#), Department of Computer Science and Engineering

- Used vectors and game trees in a program with **reduced time complexity** to play Othello against the computer
- Implemented **negamax algorithm** using **alpha beta pruning** to design the AI and employed graphics

### Lean Six Sigma Green Belt Training Program, *KPMG* [Oct '18]

- Learnt Six Sigma methodology and Define-Measure-Analyse-Improve-Control (**DMAIC** approach) for project analysis and management
- Derived solutions for hypothetical **six sigma business problems** using statistical tools and techniques in a group

## Professional Experience

### Deutsche Bank (Global Markets Division)

[May 2018 - Jul 2018]

*Advisory Team, Asia Pacific Desk, Mumbai*

- Developed a **Client Solution** tool, supported by excel VBA for opportunity identification, custom analysis and derivative pricing of hedging solutions for all Asian currency pairs vs USD and EUR
- Contributed to a **6 billion USD** deal with a multinational phone manufacturer which recently had its IPO, did custom **Value at Risk** analysis and **correlation matrix** comparison to assess risks in different currency pairs
- Deployed **Cost Savings Analysis** for onshore and offshore curves for companies which have both options
- Undertook research regarding **historical and implied volatilities** and their implications
- Increased efficiency by 90%, since the company has been slower than its peers in incorporating technology in its day-to-day activities, there was huge scope for improvement
- Desk work: Biweekly M&A posts, trading range updates and company benchmarking

### Indian School of Business (Center for Analytical Finance)

[May 2017 - Jul 2017]

*Received Letter of Recommendation from director, Center for Analytical Finance*

- Devised algorithms in Python and VBA to implement 5 **trading strategies** on the Indian Equity Markets using existing literature based on F-Score, Accruals, Betting against beta, G-Score, Momentum Factors
- Successfully found **complexity** of Independent Auditor's reports of **FTSE 800** companies, performed sentiment analysis on analyst call reports and incorporated the results through wordcloud using R
- Evaluated **related party transactions** with respect to **Corporate Governance** standards and violations in India, recommendations from this research included in final report to the SEBI Committee

### Great Eastern Shipping Co. Ltd. (Accounts Department)

[May 2016 - Jun 2016]

- Reviewed preparation and analysis of **financial statements** and **journal entries**
- Investigated the importance and use of **Books of Accounts** in recording business transactions
- Assisted accounts department in reviewing the company's **Annual Report** for Financial Year 2016
- Studied different investment plans and collected data to compare investment options in diverse public sector companies, on the basis of **IRR and NPV values**

## International Exposure and Conferences

### Nanyang Technological University, Singapore, Semester Exchange

[Autumn '17]

- One of 3 students** selected on basis of exceptional academic performance for semester abroad program
- Joined the chess, basketball, dance and word games clubs, learnt Latin dances like **Rumba** and **Cha Cha Cha**
- Did courses in Computer Science and Engineering, Mechanical Engineering and Mathematics Departments

### World Business Dialogue, Germany, Business Conference

[Feb 2019]

- Secured second position in **Covestro Creation Lab**, mapped the digital customer journey of a product designer
- Attended **keynote speeches** and panel discussions on digitalization in educational institutions and workspace
- Solution included **virtual reality** space, upgradation of **web services**, suggestions of **iterative prototype** cycles

### Future Leaders Congress, Thailand, United Nations Conference Center

[Sep 2018]

- Chosen as one of 300 delegates across Asia Pacific Region to discuss the world's biggest problems
- Gained **invaluable insights** from speakers Ankit Kawatra, Gamal Albinsaid, Florince Epphe, Dong Chan Kim and Dinno Pati as they shared their success and failure stories
- Collaborated with delegates from Africa, Thailand and China and **proposed business model** for a **Schoolage for the elderly**: a place where the elderly can contribute effectively to society despite their age

### Women Emerging in Finance, Bangalore, Goldman Sachs

[Jan 2018]

- Selected among 100 women from all over IITs and IIMs for a **two-day interactive workshop**
- Successfully presented a **business plan** of an interior design firm, based on growth of the decor industry
- Heard from their senior leaders, met and networked with their risk management and global markets teams and learn about the firm, its divisions and its culture

## Youth Delegation to South Korea, *Ministry of Youth Affairs & Sports* [May 2017]

- Represented India as part of a **34-member delegation**, greeted the **Korean Minister for Gender Equality**
- Interacted with Korean youths from various high schools on topics ranging from technology to culture
- Participated in a **2 day Homestay Program** to understand daily life of Koreans
- Attended sessions on economic and political affairs at Gangwon Foreign Language High School

## Positions of Responsibility

### Institute Student Mentor, *Institute Student Mentorship Program* [Apr 2018 - Present]

- One of **92** mentors selected from **290 applicants** after rigorous screening based on **personal interview, peer reviews and all-round performance**
- Responsible for guiding a batch of **12 freshmen students** to increase their overall performance and to help them cope up with the academics, hostel life and social culture in the institute.
- Responsibilities include facilitating and improving faculty-student interaction within the department.
- Volunteered as point of contact between freshmen and institute clearing issues regarding reservation quota

### Institute Events Sports Convener, *Institute Sports Council* [Apr 2016 - Mar 2017]

- Responsible for ideating and conducting all sports events in the institute catering to **10,000+ people**
- **Successfully organized** and executed the inter-hostel Basketball, Badminton and Chess General championships
- Conceptualized and designed the publicity posters for the **Summer School of Sports**, leading to a **300 % y-o-y increase**
- Contributed to **girls' sports mentorship program** by motivating participation in unconventional sports like cricket, hockey and football

### Institute Exchange Buddy, *International Relations Office* [Jan 2018 - Dec 2018]

- Guide and **support system** to incoming exchange students from ETH Zurich and KTH Sweden
- Facilitated their smooth transition into the institute and helped them get accustomed to the working of the campus, city and the country

## Extra-Curricular Activities

### Sports

- Represented IIT Bombay as a member of the **institute basketball team** at 51st Inter-IIT Sports Meet, Kanpur
- Member of **National Sports Organisation (NSO)** Basketball for a year
- Bestowed **Hostel Player of the Chess General Championship**
- Awarded **Hostel Sports Special Mention** for contribution to the hostel's sports culture
- Secured **gold** in KJ Somaiya's sports fest SKREAM, **silver** in the ICT basketball tournaments
- Bagged Gold in **Tug of War** and Basketball GCs; Silver in **Squash** and **Chess** GCs; Bronze in **Carrom** GC
- Stood **1st** in Chess Tournament organised by PACE Junior College
- Won numerous basketball tournaments as part of the school's basketball team for five years
- Engaged in Summer sports camps in swimming and lawn tennis, received yellow belt in judo

### Culturals

- **Finalist** of group dance BollyNritya competition in Kaleidoscope, cultural fest of Sophia College
- Actively participated in institute **Dance and Drama showcases** (Performing Arts Festival, Annual Insync Dance Show, Salsa Night, Arabian Nights)
- Awarded **Trinity Guildhall** for clearing Speech and Drama Grade 1, 2 and 3 with distinction

### Social

- Conceptualized the **DhyanChand Donation Drive** for donating old sports equipment in orphanages
- Contributed to social campaign, **Rethink Pink: Breast Cancer Awareness**, with an outreach of 3 Lakh+
- Volunteered in events and an active member of **Saathi, The LGBTQ Resource Group** of IIT Bombay
- Did Socially Useful Productive Work (SUPW), performed a play on women education in Alibaug villages, visited orphanages and participated in beach clean-up post Ganesh Visarjan
- Member of Red Cross NTU (Nanyang Technological University) Chapter, visited an old age home