

# Kapil Gupta

PhD Candidate, Decision Sciences Area, IIM Bangalore, India  
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## Research Interests

Spatial Statistics, House Price Dynamics, Spatio-Temporal Modelling, Clustering and Classification, Sports Analytics, Applications of Variable Selection Methods.

## Education

- Indian Institute of Management Bangalore** **Bangalore, India**  
(Expected) Dec 2024
  - Doctoral Candidate in Decision Sciences Area  
Recipient of the Director's Merit List Award in both the years during the coursework  
Thesis: Analysing House Price Dynamics using Novel Spatio-Temporal Methods  
Advisor: [Dr. Soudeep Deb](#)  
Other committee members: [Dr. Venkatesh Panchapagesan](#), [Dr. Kunal Dasgupta](#), [Dr. Anand Deo](#)
- Indian Institute of Technology Delhi** **Delhi, India**  
Jul 2016–May 2018
  - Master of Science in Mathematics  
Thesis: Numerical Solutions of Singularly Perturbed Linear Problems in One Dimension  
Advisor: [Dr. S. Chandra Sekhara Rao](#)
- Indian Institute of Information Technology, Design and Manufacturing, Kancheepuram** **Chennai, India**  
Aug 2012–May 2016
  - Bachelor of Technology in Computer Engineering  
Thesis: The cd-coloring of bipartite graphs  
Advisor: [Dr. Shalu M A](#)

## Experience

- Smart City Mission, Ministry of Housing & Urban Affairs, India** **New Delhi, India**  
Feb 2024–Jul 2024
  - Research Consultant  
- Analysing the improvement in quality of education through smart classrooms.
- Real Estate Research Initiative(IIMB-RERI)** **Bangalore, India**  
Since Mar 2023
  - Research Consultant  
- Working on the development of a commercial rental index through spatio-temporal modeling.
- Indxx, LLC** **Gurgaon, India**  
Jun 2018–Jul 2020
  - Senior Data Analyst, Engineering Division  
- Developed and calculated In-house and client based indices using SQL.
- Indian Institute of Science Education & Research** **Bhopal, India**  
May 2014–Jun 2014
  - Summer Research Intern, Department of Mathematics  
- Reading project in ordinary differential equations under the guidance of [Dr. Ashish Gupta](#).

## Awards and Honors

- The Florintree Scholarship Award, Indian Institute of Management Bangalore** Sep 2024
  - The aim of the award is to promote excellence in management research.
- Doctoral Student Research Paper Awards of 2024, Indian Institute of Management Bangalore** Sep 2024
  - The award aims to recognize good journal papers in the field of management research .
- ISBA Travel Award: BNP Networking Workshop 2024** Jul 2024
  - Awarded 800 USD travel support by the Bayesian Nonparametric Section of ISBA.
- First Best Paper Award- PhD Scholar Category** Dec 2023
  - JOINT EVENT: 2023-ORSI & 2023-ICBAI, IISC Bangalore, India
- Director's Merit List Award** Jun 2021 & 2022
  - Indian Institute of Management Bangalore
- Employee of the Year - Entrepreneurship** Nov 2019
  - Indxx, LLC
- All India Rank 235** Mar 2018
  - GATE Mathematics
- All India Rank 30** Jun 2017
  - CSIR-NET Mathematics
- All India Rank 60** Mar 2016
  - IIT JAM Mathematics

## Graduate Coursework

- Probability Theory, Statistical Inference, Multivariate Statistics, Advanced statistical Methods and Computing, Multilevel Analysis, Advance Econometrics, Financial Econometrics, Marketing Models and Estimation, Mathematical Methods for Management Research, Linear Programming and Networks, Stochastic Models, Dynamic Programming

## Publications

- **Gupta, K.**, Krishnamurthy, V., Deb, S. (2024). What elements of the opening set influence the outcome of a tennis match? An in-depth analysis of Wimbledon data, [IIMB Management Review \(ABDC ranking B\)](#). [\[early view\]](#)
- **Gupta, K.**(2022). An integrated batting performance analytics model for women's cricket using Principal Component Analysis and Gini scores, [Decision Analytics Journal](#). [\[publication\]](#)

## Submitted Articles

- **Gupta, K.**, Deb, S. (2023+) A divide-and-conquer approach for spatio-temporal analysis of large house price data from Greater London. Under review at [The Journal of the Royal Statistical Society, Series A \(Statistics in Society\) \(ABDC ranking A\)](#). [\[Pre-print\]](#)
- Bag, S., **Gupta, K.**, Deb, S. (2022+). A review and recommendations on variable selection methods in regression models for binary data. Under revision at [International Statistical Review \(ABDC ranking A\)](#). [\[Pre-print\]](#)

## Manuscript in preparation

- **Gupta, K.**, Deb, S., Panchapagesan, V. A novel spatio-temporal statistical model to analyze the real estate market in Bangalore. **Abstract:** Our study adds to recent statistical research in real estate by revealing spatial and temporal dependence patterns in real estate prices. Introducing a novel statistical model, we efficiently capture these dependencies using a separable Gaussian spatio-temporal process with an additive mean structure and a random error process.
- **Gupta, K.**, Deb, S., Panchapagesan, V. Spatial Modelling of Residential Real Estate Prices in Bengaluru, India. **Abstract:** We propose a Bayesian spatial model to capture the dynamic patterns of real estate prices. Utilizing a Gaussian spatial process, we integrate an additive mean structure with a random error component to account for spatial dependencies. Applied to transaction data from Bengaluru's 165 micromarkets and 1,127 projects (2017-2023), the model demonstrates flexibility and computational efficiency.

## Work in progress

- **Gupta, K.**, Deb, S. Unveiling dynamics: A mixture model approach for addressing missingness in spatio-temporal data. **Abstract:** This study addresses the challenge of missing spatio-temporal data in housing market analysis, where property transactions occur infrequently. Common assumptions in spatio-temporal analysis do not hold in this context, risking the oversight of valuable insights. We propose a novel spatio-temporal mixture model that distinguishes between observed and unobserved data, incorporating a latent variable to account for missing data points.
- **Gupta, K.** A Robust Multilevel Modeling Approach to Ranking Women's Batting Performances in Cricket. **Abstract:** Historically, women's cricket has received less attention than men's. This study introduces an advanced ranking system for women batters in ODIs, utilizing a two-level negative binomial model to account for runs, strike rates, and variables like not-out status and opposition strength. This model provides a more accurate and equitable ranking compared to simpler approaches, offering valuable insights for enhancing the recognition of women's contributions.

## Teaching Experience at IIM Bangalore

### Course Instructor.....

- *Introduction to Regression Models (Foundations of Management course for undergraduates)* Apr 2024
  - Overall Rating: 3.83/5 (No. of respondents: 35)
- *Probability and Statistics (Pre-doctoral course)* Sep–Nov 2023
  - Overall Rating: 4.25/5 (No. of respondents: 12)
- *Quantitative Techniques (MBA preparatory course)* Jun 2023
  - Overall Rating: 4.5/5 (No. of respondents: 26)
- *R for Data Science (MBA preparatory course)* Jun 2023
  - Overall Rating: 4.3/5 (No. of respondents: 65)
- *Calculus (PhD preparatory course)* Jun 2023
  - Overall Rating: 3.6/5 (No. of respondents: 11)

### Teaching Assistant.....

- *Sports Analytics (MBA)* Jun–Aug 2023, 2024
- *Multivariate Data Analysis (MBA)* Jun–Aug 2023
- *Data Science Doctrines: Prediction, Inference, and Causality (MBA)* Oct–Dec 2022

- *Decision Sciences II (MBA)*
- *Decision Sciences I (MBA)*

Oct–Dec 2022  
Jul–Sep 2022

## Presentation and Talks

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- **MathSport Asia 2024, IIM Udaipur, India**  
“A Robust Multilevel Modeling Approach to Ranking Women’s Batting Performances in Cricket”. Dec 2024
- **India Management Research Conference 2024, IIM Ahmedabad, India**  
“Spatial Modelling of Residential Real Estate Prices in Bengaluru, India”. Dec 2024
- **India Management Research Conference 2024, IIM Ahmedabad, India**  
“A divide-and-conquer approach for spatio-temporal analysis of large house price data from Greater London”. Dec 2024
- **BNP Networking Workshop 2024, National University of Singapore**  
“A divide-and-conquer approach for spatio-temporal analysis of large house price data from Greater London”. Aug 2024
- **(Poster) BAYSM 2024, Ca’ Foscari University of Venice, Italy**  
“A mixture model approach for addressing missingness in spatio-temporal data”. Jun 2024
- **(Poster) ISBA satellite workshop, Università della Svizzera italiana, Lugano**  
“A mixture model approach for addressing missingness in spatio-temporal data”. Jun 2024
- **JOINT EVENT: 2023-ORSI & 2023-ICBAI, IISC Bangalore, India**  
“A Novel Spatio-Temporal Statistical Model to Analyze Real Estate Market in Bengaluru, India”. Dec 2023
- **Annual International Research Conference (AIRC), IIM Lucknow, India**  
“A Novel Spatio-Temporal Statistical Model to Analyze Real Estate Market in Bengaluru, India”. Dec 2023
- **Indo-German workshop on Data Mathematics and Scientific Computing , IIT Tirupati, India**  
“Efficient Divide-and-Conquer Approach for Spatio-Temporal Modeling of Real Estate Data”. Sep 2023
- **Invited Talk: 6th International Conference on Econometrics and Statistics, Tokyo, Japan**  
“Efficient Divide-and-Conquer Approach for Spatio-Temporal Modeling of Real Estate Data”. Aug 2023
- **IMR Doctoral Conference, 2023, IIM Bangalore, India**  
“What elements of the opening set influence the outcome of a tennis match? An in-depth analysis of Wimbledon data”. Feb 2023  
– One of the 10 papers accepted out of 98 submissions.
- **Management Doctoral Colloquium Shodh Samagam, IIM Visakhapatnam, India**  
“Measuring Batting Performance in Women’s Cricket - An In-Depth Analysis of One-Day International Matches”. Dec 2021
- **8th MathSport International Conference, University of Reading, UK**  
“Does the outcome of a tennis match hinge on the opening set? An in-depth analysis of the Wimbledon data”. Jun 2021

## Professional Memberships

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- *The International Society for Bayesian Analysis (ISBA)* Jan 2024–Present
- *The junior section of the International Society for Bayesian Analysis (j-ISBA)* Jan 2024–Present
- *International Indian Statistical Association (IISA)* Dec 2022–Present
- *Institute of Mathematical Statistics (IMS)* Dec 2021–Present

## Positions of Responsibility

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- **Reviewer**  
*Research in Transportation Business & Management Journal* Jan 2024
- **Session Moderator (Young Researchers from India)** Online
- *International Day of Women in Statistics and Data Science* Oct 2023
- **Session Chair (Spatial Statistics Session)** Tokyo, Japan
- *6th International Conference on Econometrics and Statistics* Aug 2023
- **Indian Institute of Management Bangalore** Bangalore, India
- *PhD Students Academic Representative* Nov.2020–Oct.2021
- **Indian Institute of Technology Delhi** Delhi, India
- *MSc Mathematics 2016 batch class representative* Jul 2016–May 2018

## Computer Skills

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R, SQL,  $\text{\LaTeX}$ , Python, MATLAB, C, C++, Microsoft Office.