# Soudeep Deb

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| **CURRENT POSITION** | **Assistant Professor**, Young Faculty Research Chair<br>Decision Sciences Area<br>Indian Institute of Management Bangalore, India. | Webpage: soudeepd.github.io<br>Phone: +91 80-26993387<br>E-mail: soudeep@iimb.ac.in |

**CITIZENSHIP** India

**RESEARCH INTERESTS** Time series data, Spatial statistics, Spatio-temporal modeling, Clustering and classification, Sports analytics, Application of time series and spatial statistics in finance and other disciplines.

**EXPERIENCE**

**Indian Institute of Management Bangalore**, KA, India. Mar 2020 - Present

- Assistant Professor, Young Faculty Research Chair, Decision Sciences Area.

**NBC Universal Media, LLC.**, New York, NY, USA. Sep 2018 - Feb 2020

- Senior Lead Data Scientist, Decision Sciences Division.

**EDUCATION**

**University of Chicago**, Chicago, IL, USA.

**Ph.D., Statistics** Aug 2018

- Thesis: Irregular spaced random field, Spatio-temporal data and Clustering of time series
- Advisor: Dr. Wei Biao Wu
- Other committee members: Dr. Ruey S. Tsay and Dr. Michael L. Stein

**Indian Statistical Institute**, Kolkata, WB, India.

**Master of Statistics (M. Stat.)** May 2013

- First Division with Distinction
- Specialization: Mathematical Statistics and Probability
- Dissertation: Association analysis for identifying rare genetic variants
- Advisor: Dr. Saurabh Ghosh

**Bachelor of Statistics (B. Stat.)** May 2011

- First Division with Distinction

**TEACHING & ADVISING**

**PhD thesis advisor**:

- Anchal Soni, Indian Institute of Management Bangalore. (Expected) Summer 2023
- Siddharth Rawat, Indian Institute of Management Bangalore. (Expected) Summer 2023
- (Co-advised) Archi Roy, Indian Institute of Science Education & Research Pune. (Expected) 2025
- Kapil Gupta, Indian Institute of Management Bangalore. (Expected) 2025

**Course instructor**, at Indian Institute of Management, Bangalore:

- Decision Sciences I (PGP/MBA) Term 1 of 2022
- Multivariate Statistics (FPM/PhD) Term 3 of 2021
- Decision Sciences I (PGP/MBA) Term 1 of 2021
- Statistical Inference (FPM/PhD) Term 2 of 2020
- Decision Sciences I (PGP/MBA) Term 1 of 2020

**Course instructor**, at University of Chicago:

- Introductory Statistics, Chicago Academic Achievement Program (UG) Summers of 2015, 2017
- Statistical Models and Methods I (UG) Winter 2015

**RESEARCH GRANTS**

**Research Seed Grant** from IIM Bangalore, India:

- Project: New techniques to analyze categorical and discrete time series data
- Amount: INR 250,000 for two years (August 2021 to July 2023)

**Young Faculty Research Grant** from IIM Bangalore, India:

- Amount: INR 900,000 for three years (March 2020 to February 2023)

PUBLICATIONS

1. **Deb, S.**, Deb, S. (2022). An ensemble method for early prediction of dengue outbreak. Journal of the Royal Statistical Society Series A, 185(1), 84-101.

2. **Deb, S.**, Majumdar, M. (2022). A quadratic trend-based time series method to analyze the early incidence pattern of COVID-19. Accepted in Biostatistics & Epidemiology.

3. Rawat, S., **Deb, S.** (2021). A spatio-temporal statistical model to analyze COVID-19 spread in the USA. Accepted in the Journal of Applied Statistics.

4. **Deb, S.** (2021). Analyzing airlines stock price volatility during COVID-19 pandemic through internet search data. Accepted in the International Journal of Finance & Economics.

5. Nahata, S., **Deb, S.** (2021) A Machine Learning Approach to Analyze the Effect of Situational and Player-Dependent Features on Converting Freekicks in Soccer. In Conference Proceedings 2021 Asia-Singapore Conference on Sport Science (p. 19).

6. **Deb, S.**, Tsay, R. S. (2019). Spatio-temporal Models with Space-time Interaction and Their Applications to Air Pollution Data. Statistica Sinica, 29, 1181-1207.

7. **Deb, S.**, Dey, D. (2019). Spatial Modeling of Shot Conversion in Soccer to Single out Goalscoring Ability. Journal of Sports Analytics, 5(4), 281-297.

8. **Deb, S.** (2019). VAR Model Based Clustering Method for Multivariate Time Series Data. Journal of Mathematical Sciences, 237(6), 754-765.

9. Prickett, K.C., Guiterrez, C., **Deb, S.** (2019). Family Firearm Ownership and Firearm-related Mortality among Young Children: 1976-2016. Pediatrics, 143(2), e20181171.

10. Chazin, H., **Deb, S.**, Falk, J., Srinivasan, A. (2019). New Statistical Approaches to Intra-individual Isotopic Analysis and Modelling of Birth Seasonality in Studies of Herd Animals. Archaeometry, 61(2), 478-493.

11. **Deb, S.**, Pourahmadi, M., Wu, W. B. (2017). An Asymptotic Theory for Spectral Analysis of Random Fields. Electronic Journal of Statistics, Vol. 11, No. 2, p. 4297-4322.

12. Zechner, C., **Deb, S.**, Koeppl, H. (2013). Marginal Dynamics of Stochastic Biochemical Networks in Random Environments. In Control Conference (ECC), 2013 European, p. 4269-4274, IEEE.

13. Ghosh, S., **Deb, S.** (2013). A Clustering Approach for Mapping Rare Variants Based in Mutual Association. Human Heredity, Vol. 76, No. 2, pp. 98-98.

SUBMITTED ARTICLES

1. **Deb, S.**, Jana, K. (2022+). Nonparametric quantile regression for time series with replications and its application to climate data. Under revision. Pre-print: https://arxiv.org/abs/2107.02091.

2. **Deb, S.**, Karmakar, S. (2022+). A novel spatio-temporal clustering algorithm with applications on COVID-19 data from the United States. Under review.

3. Rawat, S., **Deb, S.** (2022+). Impact of rising temperature on rainfall: A spatio-temporal study from Bangladesh. Under review.

4. Soni, A., **Deb, S.**, Das, D., Zaremba, A. (2022+). The Value-at-Risk transmission of cryptocurrencies using group transfer entropy: New evidence under structural breaks and alternate choice of conditional distribution. Under review.

5. Roy, A., **Deb, S.**, Chakarwarti, D. (2022+) Impact of COVID-19 on public social life and mental health: A statistical study of Google Trends data from the USA. Under review.

6. Paul, M., Roy, R., **Deb, S.** (2022+). Effect of influence in voter models and its application in detecting frauds in an election. Under review.

7. Roy, A., Soni, A., **Deb, S.** (2022+) A wavelet-based methodology to compare the impact of pandemic versus Russia-Ukraine conflict on Brent's Crude Oil and its interconnectedness with S&P500, Bitcoin and gold. Under review.

8. **Deb, S.**, Das, S. (2022+). Optimal selection of the starting lineup for a football team. Under review.

9. Bag, S., Gupta, K., **Deb, S.** (2022+). A review and recommendations on variable selection methods in regression models for binary data. Under review. Pre-print: https://arxiv.org/abs/2201.06063.

10. **Deb, S.**, Roy, R., Das, S. (2022+). Forecasting Elections from Partial Information Using a Bayesian Model for a Multinomial Sequence of Data. Under review. Pre-print: https://arxiv.org/abs/2104.02924.

11. Mareeswaran, M., Sen, S., **Deb, S.** (2021+). New methods of structural break detection and an ensemble approach to analyze exchange rate volatility of INR during COVID-19. Under revision.

12. **Deb, S.** (2021+). A goal based index to analyze the competitive balance of a football league. Under second revision. Pre-print: https://arxiv.org/abs/2102.09288.

Seminars
1. Analyzing count data using a time series model with an exponentially decaying covariance structure. EURO 2022 Conference, Finland. Jul 2022

2. A goal based index to analyze the competitive balance of a football league. 8th Western Conference on Football and Finance, Reading, UK. May 2022

3. Developing statistical methods in Health (Epidemiological) Data. SERB-AV Workshop 2022, IIIT Dharwad, India. May 2022

4. New methods of structural break detection in multivariate time series and its use in modeling financial data. StatFin Webinar 2022, IISER Pune, India. Mar 2022

5. A new classification method for multivariate time series data. 14th International Conference of the ERCIM WG on Computational and Methodological Statistics, London, UK. Dec 2021

6. Impact of global warming on rainfall: A Spatio-temporal study. RSS International conference 2021 (virtual), Manchester, UK. Sep 2021

7. Analyzing count data using a time series model with an exponentially decaying covariance structure. 2021 Australian and New Zealand Statistical Conference (virtual), Australia. Jul 2021

8. Spectral density based clustering method for spatio-temporal datasets. 4th International Conference on Econometrics and Statistics, EcoSta 2021 (virtual), Hong Kong. Jun 2021

9. A Mathematical Take on the Competitive Balance of a Football League. Guest lecture (virtual), Mathematics of Sports, Stanford University, Stanford, USA. May 2021

10. New Methods of Clustering Time-series Data and its Applications. Colloquium, Indian Statistical Institute, Bangalore, India. Nov 2019

11. Spatio-temporal Models with Space-time Interaction and Their Applications to Air Pollution Data. Statistics colloquium, Northern Illinois University, Dekalb, USA. Dec 2017

12. VAR Model Based Clustering Method for Multivariate Time Series Data. XXXIV. International Seminar on Stability Problems for Stochastic Models, Debrecen, Hungary. Aug 2017

13. Spatio-temporal Models with Space-time Interaction and Their Applications to Air Pollution Data. NBER/NSF Time Series Conference, New York, USA. Sep 2016

14. Hydropower Construction and Deforestation in the Tapajós River Basin: The Effect on Water Balance. Symposium on deforestation, Ministry of Environment, Brasília, Brazil. Aug 2016

15. Estimating Genetic Relationship between Random Individuals from Genome Sequence Data. Young Statisticians Conference, Melbourne, Australia. Feb 2013

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| PROFESSIONAL SERVICES | **Reviewer** for the following journals: |

- Biometrics
- Electronic Journal of Statistics
- IIMB Management Review
- Indian Journal of Science and Technology
- Journal of Advances in Management Research
- Journal of Behavioral and Experimental Finance
- Journal of Sports Analytics
- Journal of the Royal Statistical Society: Series C
- Linear Algebra and its Applications
- Sankhya A and Sankhya B
- Statistics and Probability Letters

HONORS

**University of Chicago:**

- International House Ralph W. Nicholas Fellowship Award     2017-18
- Graduate Council Travel Fund Award     2017
- Senior Consultant, Department of Statistics     2016-17
- Runner-up for Department of Statistics Consulting Award     2016
- Nominated for Best Teaching Assistant in Physical Sciences Division     Winter 2014

**Other Awards:**

- Kishore Vaigyanik Protsahan Yojana scholarship, Indian Institute of Science     2007 to 2013
- Selected for International Mathematical Olympiad Training Camp, India     2007 & 2008

OTHER EXPERIENCE

**The Alan Turing Institute**, London, United Kingdom     Dec 2017

- Position: Delegate for the Data Study Group.
- Project: Geospatial time-series analyses to predict demand for a global satellite communications network.

**Instituto de Pesquisa Ambiental do Amazônia**, Brasília, Brazil     Jun - Aug 2016

- Position: Summer fellow.
- Project: Hydropower Construction and Deforestation in the Tapajós River Basin: Linking Forest Cover to Changes in Water Balance.

**Eidgenossische Technische Hochschule** (ETH), Zurich, Switzerland     May - Jul 2013

- Position: Summer research intern.
- Project: Moment-Closure Approximations for Mass-action Models in Chemical Kinetics.

**Eidgenossische Technische Hochschule** (ETH), Zurich, Switzerland     Jun - Jul 2012

- Position: Summer research intern.
- Project: Marginal Dynamics of Stochastic Biochemical Networks in Random Environments.

**Ministry of Statistics and Programme Implementation**, Govt. of India     May 2012

- Position: Team member
- Project: Forecasting of Foreign-tourist Arrivals in India.

**Johns Hopkins University**, Baltimore, United States of America     May - Jul 2011

- Position: Summer research intern
- Project: Estimating Relationship between Random Individuals from Genome Sequence Data.

SKILLS

**Technical strength:**

- Proficient: R, MATLAB, LaTeX, Microsoft Office
- Working knowledge: Python, SQL, C.

**Languages:**

- Fluent in reading, writing, speaking: English, Bengali, Hindi.
- Basic reading and speaking: Portuguese.