

Archi Roy

Doctoral Student
Department of Mathematics
Indian Institute of Science Education and Research,
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RESEARCH INTERESTS

Structural Breaks, Time Series Modelling, Financial Markets, Financial Econometrics, Non-Parametric Methods, Wavelet Regression, Deep Learning

EDUCATION

- Indian Institute of Science Education and Research** Pune, India
Ph.D. in Mathematics Expected completion by Summer 2025
- Indian Institute of Science Education and Research** Pune, India
Masters' Degree in Mathematics; GPA: 6.6 2019-2021
- St. Xavier's College (Autonomous)** Kolkata, India
Bachelor's Degree in Statistics; GPA: 7.35 2016-2019
- Pathabhavan, Visvabharati** Santiniketan, India
Pre-Degree Examination - Stream: Science; Aggregate: 96.3% 2016
- Pathabhavan, Visvabharati** Santiniketan, India
School Final Examination; Aggregate: 91.1% 2014

THESIS

Thesis title: Impact of External Shocks and Disasters on Cryptocurrency Markets

Thesis Supervisor:

- [Prof. Moumanti Podder](#), Indian Institute of Science Education and Research (IISER), Pune, India
- [Prof. Soudeep Deb](#), Indian Institute of Management (IIM), Bangalore, India

Other committee members:

- [Prof. Anindya Goswami](#), Indian Institute of Science Education and Research (IISER), Pune, India
- [Prof. Apratim Guha](#), Xavier School of Management (XLRI), Jamshedpur, India

PUBLICATIONS

- Roy, A., Soni, A., Deb. S. (2023):** A wavelet-based methodology to compare the impact of pandemic versus Russia-Ukraine conflict on crude oil sector and its interconnectedness with other energy and non-energy markets. *Energy Economics*, 124, 106830. [\[link\]](#)
- Roy, A., Deb, S., Chakrawarti, D. (2023):** Impact of COVID-19 on public social life and mental health: a statistical study of Google trends data from the USA. *Journal of Applied Statistics*, 1-25. [\[link\]](#)

WORK IN PROGRESS

- Roy, A., Podder, M., Deb, S.:** A Novel Non-Parametric Method of Detection of Structural Breaks. Manuscript in preparation.
- Roy, A., Guha, A., Chakrabarti, A.:** Extracting Cores with Long-Term Equilibrium Linkages from Financial Time Series Networks. Manuscript in preparation.
- Roy, A., Dattner, I., Podder, M.:** An Adaptive Rate-Optimal Test of Goodness-of-Fit for Systems of Ordinary Differential Equations. Manuscript in preparation.
- Roy, A., Deb, S., Mukherjee, S.:** Multivariate Quantile Crossing in Shape Constrained Regression Model. Manuscript in Progress.

TEACHING EXPERIENCE

- Teachine Assistant:**
 - Generalized Linear Models** (undergraduate), Indian Institute of Science, Education and Research (IISER), Pune (Spring 2024)
 - Probability Theory** (undergraduate), Indian Institute of Science, Education and Research (IISER), Pune (Fall 2023)
 - Bayesian Methods and Practice** (graduate), Indian Institute of Science, Education and Research (IISER), Pune (Spring 2023)
 - Statistical Inference** (graduate), Indian Institute of Science, Education and Research (IISER), Pune (Fall 2022)
- Resource Person:**
 - Probability Theory and R Programming**, Summer School for Women in Mathematics and Statistics (SWMS) 2023 organized by International Center for Theoretical Sciences (ICTS-TIFR), India

HONORS

- **DST SHE (Scholarship for Higher Education) Scholarship (2016-2019):** Offered by Department of Science and Technology, Govt. of India for students pursuing higher education in natural sciences
- **All India Rank 80:** Joint Admission Test for Masters, organized by Indian Institute of Technology (IIT) for admission in post-graduate science programs

CONFERENCES

- **38th Annual Conference of Ramanujan Mathematical Society (2023):** “Nonparametric detection of structural breaks in financial data”
- **3rd Annual International Research Conference (AIRC) and Doctoral Workshop (2023):** “A novel nonparametric changepoint detection method for heavy-tailed data”
- **2022 IMS International Conference on Statistics and Data Science (ICSDDS):** “Wavelet analysis of the impact of the COVID-19 crisis vs Russia-Ukraine war on energy and non-energy markets”

WORKSHOPS

- **Lectures in Statistics: Indo-French Workshop in honor of Professor C.R.Rao:** (2021) Organized jointly by Indo-French Center for Applied Mathematics and Indian Statistical Institute (ISI) Kolkata, India
- **Artificial Intelligence and Machine Learning Using Python:** (2020) Organized by Finland Labs, in association with National Social Summit, Indian Institute of Technology (IIT), Roorkee
- **Machine Learning and Artificial Intelligence for COVID-19 Data Analysis:** (2020) Organized by Finland Labs, in association with National Social Summit, Indian Institute of Technology (IIT), Roorkee
- **Microsoft Training Series on Artificial Intelligence:** (2020) Organized by Microsoft, India and National Association of Software and Service Companies(NASSCOM), India
- **Internet of Things Using Raspberry Pi:** (2020) Organized by Finland Labs, New Delhi, India

SKILLS

- **Proficient:** R, Matlab, Python, MINITAB, \LaTeX , Microsoft Office, Google Suite (Gmail, Docs, Slides, Sheets)
- **Working Knowledge:** C, C++

LANGUAGE PROFICIENCY

- **Proficient(reading, writing, speaking):** English, Hindi, Bengali
- **Working Knowledge:** Urdu, French

OTHER INTERESTS

Outside academia, I love to spend time solving interesting mathematical puzzles and coding challenges available online. I also am enthusiastic about studying literature, theatre, Urdu poetry, feminism, human rights, the history of fine arts and photography. I attended several training programs on Child Protection, Prevention of Sexual Exploitation and Abuse (PSEA), Essential Service Package for Women and Girls Subject to Violence and other short-term training programs offered by UNWOMEN, UNICEF and UNESCO. I wish to study and work more on these in future.