Subrata Pal

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Education

2018-2025 (Expected) Ph.D. candidate, Department of Statistics, Iowa State University.
Advisors: **Somak Dutta** and **Ranjan Maitra**.

2016-18 M.Stat., Indian Statistical Institute, Kolkata, India - passed with distinction (Specialization: Theoretical Statistics)

2013-16 B.Stat. (Hons.), Indian Statistical Institute, Kolkata, India - passed with distinction.

Areas of Interest

Computational Statistics • Spatial Statistics • Tensor-variate data • Machine Learning • Matrix-free methods.

Honors & Awards

2025 **Student paper award from the American Statistical Association (ASA) Sections on Medical Devices and Diagnostics** for *"Tensor-on-Tensor Time Series Regression for Integrated One-step Analysis of fMRI Data"*.

2023 **Research Excellence Award, Graduate College, Iowa State University**.

2023 **Student paper award from the American Statistical Association (ASA) Sections on Statistical Computing and Graphics** for *"Fast matrix-free methods for model-based personalized synthetic MR imaging"*.

2023 **Best Narrative (Statistics), International Cherry Blossom Prediction Competition**, George Mason University, Department of Statistics, jointly with Aniruddha Pathak, Kunal Das.

2022 **Vince Sposito Computing Excellence Award, Iowa State University**.

2022 **Outstanding Student Presentation Award, Honorable Mention**, 21st Conference on Artificial Intelligence for Environmental Science, 2022, American Meteorological Society Annual Meeting.

2013-18 **Inspire Scholarship**, funded by the Department of Science & Technology, Govt. of India.

Publications & Talks

Peer-reviewed Articles

2024 Tirone, E., *Pal, S.*, Gallus, W. A., Dutta, S., Maitra, R., Newman, J. L., Weber, E., and Israel Jirak, I., (2024) A Machine Learning Approach to Improve the Usability of Severe Thunderstorm Wind Reports, *Bulletin of the American Meteorological Society,* 105(3): E623-E638.
DOI: https://doi.org/10.1175/BAMS-D-22-0268.1.

2023 *Pal, S.*, Dutta, S., Maitra, R. (2023) Fast matrix-free methods for model-based personalized synthetic MR imaging, *Journal of Computational and Graphical Statistics,* 33(3): 1109-1117.
DOI: https://doi.org/10.1080/10618600.2023.2284208.

2023 *Pal, S.*, Dutta, S., Maitra, R. (2023) Personalized Synthetic MR Imaging with Deep Learning Enhancements, *Magnetic Resonance in Medicine,* 89(4): 1634-1643. DOI: 10.1002/mrm.29527.

2022 Ray, S., *Pal, S.*, Kar, S., Basu, A. (2022) Characterizing the Functional Density Power Divergence Class, *IEEE Transactions on Information Theory,* 69(2): 1141-1146. DOI: 10.1109/TIT.2022.3210436

Submitted/In-preparation Articles

2024 *Pal, S.*, Maitra R., ToTTR: Tensor-on-Tensor Time Series Regression for Integrated One-step fMRI analysis.

2024 *Pal, S.*, Dutta S., Matrix Free computations for Spatial functional Data.

2024 *Pal, S.*, Dutta S., Matrix Free Analysis of Multivariate Spatial Data.

2022 Ray, S., *Pal, S.*, Kar, S., Basu, A. Characterizing Logarithmic Bregman Functions, arXiv:2105.05963.

Invited/Juried presentations

2023 (Topic contributed session) "Fast matrix-free methods for model-based personalized synthetic MR imaging", *Joint Statistical Meetings 2023, Toronto, Canada.*

2022 (Juried) "Model-based Personalized Synthetic Magnetic Resonance Imaging", *2022 IISA Conference, Bengaluru, India.*

contributed presentations

2024 (Poster) "Matrix-free computations for factor analysis of multivariate Gaussian spatial data" *2024 ENVR Workshop in Boulder, CO, USA.*

2024 "Matrix-free computations for factor analysis of multivariate Gaussian spatial data", *Joint Statistical Meetings 2024, Portland, USA.*

2024 "ToTTR: Tensor-on-Tensor Time Series Regression for Integrated One-step fMRI analysis", *Graduate student showcase, statistics in imaging virtual working group.*

2023 (Poster) "ToTTR: Tensor-on-Tensor Time Series Regression for Integrated One-step fMRI analysis" *75th Anniversary Research Conference 2023, Ames, USA.*

2022 ' "Blowin' in the wind" - Diagnosing the Probability that a Severe Thunderstorm Wind Report is Truly Due to Severe Intensity Wind Event.', *21st Conference on Artificial Intelligence for Environmental Science, American Meteorological Society Annual Meeting 2022 (virtual Houston).*

2022 "Model-based Personalized Synthetic Magnetic Resonance Imaging", *NISS Graduate Student Research Conference, 2022, online*

2022 (Poster) "Personalized Synthetic Magnetic Resonance Imaging using Deep Learning Enhancements", *57th Summer Research Conference (SRC)in statistics and biostatistics, Georgia.*

Packages

2024 ToTR: an R package for Tensor-on-Tensor Regression with Kronecker Separable Covariance, contributing author.

2022 DeepSynMRI - Python package for Synthetic Magnetic Resonance Imaging Program using Deep Learning Enhancements, creator, maintainer, and contributing author.

2021 symr - C++, R, and Python package for model-based Synthetic Magnetic Resonance Imaging Program, creator, maintainer, and contributing author.

Other Academic Activities

Teaching & mentoring

2024-25 Mentored Srika Raja, a student of Data Science for the Public Good Young Scholars Program at Iowa State University, under the supervision of Professor Somak Dutta

2022 Grader, Introduction to Statistical Computing (STAT 579) 2022F.

2019 Lab TA, Introduction to Business Statistics II for Business school students (STAT 326) 2019S.

2018 Lab TA & grader, Statistical Methods for Research Workers (STAT 587), 2018F.

2018-19 Lab TA, Principles of Statistics (STAT 101), twice, 2018F, 2019S.

Workshop

2023 Conducted 'A Python workshop to bridge the gap between statistics and practical machine learning,' jointly with Aniruddha Pathak, Gautham Venkatasubramanian, Benjamin Jacobs, and Federico Veneri Guarch. Github link.

2019 Conducted workshop on 'Text analysis,' jointly with Fan Dai, under the supervision of Prof. Somak Dutta and Prof. Ranjan Maitra. Github link.

2014 Attended workshop on 'Winter School on Interplay between Statistics and Cryptology,' link.

Research Assistantship

2022-25 Research Assistant, Iowa State University
supervised by Maitra, R., National Institutes of Health (NIH).

2019-2022 Research Assistant, Iowa State University
"Predict the Probability that Severe Thunderstorm Wind Reports are from Severe Intensity Wind,"
supervised by Gallus, W. A., Dutta, S., Maitra, R., Newman, J. L., and Weber, E., funded by NOAA.

Journal Reviewer Services

Cancer Imaging(2021, 2024); Sankhya, Series A (2022, 2023).

Skills

Programming Languages	*Experienced:* R, C/C++, Python (including NN frameworks PyTorch and torch in R), *Familiar:* Unix systems, Shell script, Julia.
Computational Software:	*Experienced:* Matlab, Microsoft Excel; *Familiar:* JMP, SAS.
Editing Software:	LaTeX, Microsoft Word.

Others

• Contributed to various open-source programs. See Github profile.
• Extracurricular activities include photography (a few of my pictures have been/will be exhibited digitally across the globe), calligraphy, painting, playing tabla (Indian style drum), and sculpting.
• Part of a group called *Kochi Songsod* that produces Bengali audio dramas and other online content. We are on Facebook, Instagram, and YouTube. Please do visit in case you are interested!

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