Rishikesh Yadav, PhD

+1 (514) 234 8251 | kesdev101@gmail.com; rishikesh.yadav@kaust.edu.sa | yadavrishikesh.github.io | github.com/yadavrishikesh | linkedin.com/in/rishikesh-yadav-69ab371b7

Researcher with extensive research experience in the field of statistical analysis and data science across various organisations. Expertise in deploying advanced statistical models, R and Python programming, shaping decision-making frameworks, and suggesting scalable data-driven solutions. Skilled in utilizing machine learning tools to manage, validate, and interpret data. The main areas of research include Bayesian computing, spatio-temporal modeling, extreme value theory, statistical learning, and deep learning.

Professional Experience

HEC Montréal and McGill University | *Postdoctoral research fellow* | Montréal, Canada *August 2022 - Present*

- Used the Gaussian Markov random field (GMRF) techniques for scalability and ease in inference in high spatio-temporal dimensions.
- Used some popular Bayesian inferential tools such as simulation based Markov chain Monte Carlo (MCMC) and approximate Bayesian inference platforms such as INLA.
- Proposed spatial, temporal, and spatio-temporal models for several challenging real-life spatio-temporal datasets, including precipitation, landslides, transportation, wildfires, etc.
- Continuously foster communication with principal investigators (PIs) and collaborators to remain actively engaged in the research.
- Produced high-quality refereed journals in the area of specialisation, as well as wrote progress reports and present statistical findings.

King Abdullah University of Science and Technology | *Research Assistant* (Prof. Raphaël Huser) | Thuwal, Saudi Arabia *August 2017 - June 2022*

- Developed multiple novel univariate extreme value models that surpass traditional ones, while also expanding their applicability to spatio-temporal modeling. Additionally, proposed tailored Bayesian inference techniques specifically designed for these models, thereby advancing the field and addressing complex statistical challenges.
- Extensive literature reviews on spatial modeling and Bayesian inferential tools to conduct inferences, employing methodologies such as MCMC approaches. Explored advanced MCMC techniques that exploits gradient, stochastic gradient, and hessian matrices to enhance the efficiency and accuracy of the inference process, thereby contributing to robust statistical analyses.
- Prepared computational codes for projects, making them available online through GitHub for reproducibility.
- In addition to publishing in esteemed journals and writing a Ph.D. thesis, actively engaged in relevant coursework focusing on topics such as statistics, statistical learning, and machine learning, along with enhancing coding skills in R and Python.

Novartis Healthcare Pvt. Ltd. | *Associate Statistician* | Hyderabad, India *June 2016 - July 2017*

- Conducted statistical analyses on clinical trial data, involving data cleaning, summary statistics, and the use of traditional statistical methods to draw meaningful conclusions from the trial results.
- Shared statistical findings with the healthcare team, conveying key insights and implications from the data analyses in a clear and accessible manner to facilitate informed decision-making and patient care.

Ministry of Statistics and Program Implementation (MOSPI) | *Internship* | Allahabad, India *May 2015 - July 2015*

- Acquired proficiency in the sampling procedures employed by the Government of India for assessing the social status of Indian states.
- Performed statistical analysis on the BIMARU (socially backward) states of India, mainly focusing on socio-economic indicators and development metrics to assess their status and identify areas for improvement.

Education

3.7/4.0 **PhD in Statistics**, *King Abdullah University of Science and Technology (KAUST)* | Thuwal, Saudi Arabia *2017-2022*

8.4/10 **Master (M.Sc.) in Mathematical Statistics**, *Indian Institute of Technology Kanpur* | Kanpur, India *2014-2016*

77% **Bachelor (B.Sc.) in Mathematics, Physics, and Statistics**, *University of Allahabad* | Allahabad, India *2011-2014*

–Key PhD and Master Courses: Data Mining | Statistical Pattern Recognition | Machine Learning | Statistics of Extremes | Spatial Statistics | Bayesian Statistics | Computational Statistics | Contemporary Topics in Computational Science | Special Topics in Statistics | Functional Data Analysis | Advanced Statistical Inference | Linear Models

–Self learning through Coursera: Python for Data Science, AI & Development (Certificate) | Crash Course on Python. (Certificate)| Improving Deep Neural Networks: Hyperparameter Tuning, Regularization and Optimization (Certificate) | Neural Networks and Deep Learning (Certificate)

–Achievements: Secured All India Rank (AIR) - 40 in IIT JAM - 2014 (Joint Admission Test for M.Sc.) in Mathematical Statistics | Received Gold medal award for the best academic performance in bachelor degree at the University of Allahabad | Received an excellence award for best academic performance in higher secondary school

Competitions on High Dimensional Spatio-Temporal Datasets

2023 KAUST Competition on Spatial Statistics for Large Datasets *January 2023 – April 2023*

KAUST, Saudi Arabia

- Equally contributed with two peers to develop and enhance statistical and deep learning models to accurately estimate unknown model parameters and perform efficient predictions at unobserved spatial locations in very high-dimensional spatial data.
- Won two out of four competitions, and in the other two, we were runner-up among the well-known teams of experts in the field.
- Successfully published our work in a well-known statistics journal, showcasing the effectiveness of our models in handling high-dimensional spatial data.

2021 Extreme Value Analysis (EVA) Data Challenge *January 2021 - June 2021*

The University of Edinburgh, The UK

- Equal collaboration with three peers produced a spatio-temporal model combining statistical and machine learning methods for simultaneously forecasting high quantiles of wildfire counts and burnt areas. Our model, customized with GMRF structures, effectively managed high-dimensional spatio-temporal data.
- Our team ranked third among leading researchers and published our work in renowned statistics journals.

Publications

- [1] Hazra, A.*, Nag, P.*, **Yadav, R.***, Sun, Y (2024). Exploring the efficacy of statistical and deep learning methods for large spatial datasets: A Case Study. *Journal of Agricultural and Biological Statistics*. 10.1007/s13253-024-00602-4
- **Yadav, R.**, Huser, R., Opitz, T., Lombardo, L. (2023). Joint modeling of landslide counts and sizes using marked log-Gaussian point processes. *Journal of the Royal Statistical Society Series C* . 10.1093/jrsssc/qlad077
- [2] Cisneros, D.*, Gong., Y.*, **Yadav, R.***, Hazra, A., Huser, R. (2023). A combined statistical and machine learning approach for spatial prediction of extreme wildfire frequencies and sizes. *Extremes*, volume 26, 301–330. 10.1007/s10687-022-00460-8
- **Yadav, R.**, Huser, R., Opitz, T. (2022). A flexible Bayesian hierarchical modeling framework for spatially dependent peaks-over-threshold data. *Spatial Statistics*. 10.1016/j.spasta.2022.100672
- **Yadav, R.**, Huser, R., Opitz, T. (2021). Spatial hierarchical modeling of threshold exceedances using rate mixtures. *Environmetrics* **32**(3), e2662. 10.1002/env.2662
- Belzile, L., Hazra, A., **Yadav, R.** (2024). An utopic adventure in the modeling of conditional univariate and multivariate extremes. *In revision*. arXiv preprint
- **Yadav, R.**, Huser, R., Lombardo, L. (2024). Statistics of extremes for natural hazards: landslides and earthquakes. A book chapter. *Soon to be submitted*
- Belzile, L., **Yadav, R.**, Beck, N. (2024). Modeling of sparse conditional spatial extremes processes subject to left-censoring. *Soon to be submitted*
- **Yadav, R.**, Schmidt, S., Labbe, A., Jeganathan, P. (2024+). Optimizing bike networks of sensors on Montreal Island: A spatio-temporal Bayesian modeling framework. *In preparation*
- **Yadav, R.**, Huser, R., Opitz, T., Lombardo, L., Hakan, Belzile, L., T. (2024+); Joint modeling of Wenchuan landslide counts and sizes using multivariate SPDE. *In preparation*

Conferences/Workshops/Research Visits

2023 Joint Statistical Meeting (JSM 2023) | *Contributed talk* | Toronto, Canada	*Aug. 5 – Aug. 10, 2023*
2023 Extreme Value Analysis Conference | *Topic contributed talk* | Milan, Italy	*Jun. 26 – Jun. 30, 2023*
2022 IISA Conference | *Poster presentation* | Banglore, India	*Dec. 26 – Dec. 30, 2022*
Yearly Workshop for Sparse Extreme Value Models | *Topic contributed talk* | Blatten, Switzerland	*May. 30 - Jun. 2, 2022*
2022 Joint Statistical Meeting (JSM 2022) | *Topic contributed talk* | Washington, D.C., The USA	*Aug. 6 – Aug. 11, 2022*
2021 Extreme Value Analysis Conference | *Contributed talk* | Virtual	*Jun. 28 – Jul. 2, 2021*
2020 CMStatistics Conference | *Invited talk* | Virtual	*Dec. 19 – Dec. 21, 2020*
2020 Joint Statistical Meeting (JSM 2020) | *Contributed talk* | Virtual	*Aug. 1 – Aug. 6, 2020*
2019 Extreme Value Analysis Conference | *Contributed talk* | Zagreb, Croatia	*Jul. 1 – Jul. 5, 2019*
2019 Joint Statistical Meeting (JSM 2019) | *Contributed talk* | Denver, Colorado, The USA	*Jul. 27 – Aug. 1, 2019*
2018 and 2019 Statistics and Data Science Workshop | *Poster presentation* | KAUST, Saudi Arabia	*Nov. 2018 and Nov. 2019*
Visited Dr. Thomas Opitz twice at INRAE, France, for collaborative research purposes | *Research visits* | Avignon, France	*March 2018 and September 2018*

Training Experiences

Teaching assistant for the course *Linear Models (STAT 230)* | KAUST, Thuwal, Saudi Arabia	*Fall 2018 semester*
Teaching assistant for the course *Probability and Statistics (STAT 220)* | KAUST, Thuwal, Saudi Arabia	*Fall 2020 semester*

Skills and Other

Programming	R (advanced) | Python (intermediate) | SAS and C (beginner)
Technical skills	Microsoft Office (Word, Excel) | R interface to Keras | R-Markdown | LaTeX
Languages	English (Fluent) | Hindi (Fluent) | Bhojpuri (Native)
Affiliations	Member of American Statistical Association (ASA) | Member of International Indian Statistical Association (IISA)
Soft Skills	Time Management | On-site coordination | Social gatherings | Active physical workouts
Citizenship	Indian
Nickname	Rishi
Age	May, 1995

[1] ⋆ denote equal contribution
[2] ⋆ denote equal contributions