



Dr. Saroja Kumar Singh

Assistant Professor

Department of Statistics

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EDUCATION

• Ph.D. in Statistics	Year
<i>Sambalpur University, Sambalpur, Odisha</i>	2020
• M.A. in Statistics	Year
<i>Sambalpur University, Sambalpur, Odisha</i>	2014

PROFESSIONAL EXPERIENCE

- Assistant Professor, Department of Statistics, Ravenshaw University, Kataka (March 2022 – Present)
- Guest Faculty, Central University of Odisha, Koraput (October 2021– March 2022)
- Guest Faculty, Department of Statistics, Ravenshaw University, Kataka (January 2021 – October, 2021)
- Guest Faculty, Department of Statistics, Gangadhar Meher University, Sambalpur (January 2015 – October 2019)

RESEARCH INTERSET

- Queueing Theory; Classical and Bayesian Inference; Reliability Theory; Stochastic Processes

COMPUTATIONAL SKILLS

- R; Python; MATLAB; SPSS

PROJECTS

- **Change point problem in queueing models and associated inference** 2023–2025
OURIIP Seed Fund, OSHEC, Govt. of Odisha

PUBLICATIONS

1. Singh, S. K. and Dalai, J. (2026). *E-Bayesian and hierarchical Bayesian estimation of performance measures in Geo/Geo/1 queueing system*. Communications in Statistics - Simulation and Computation, 1–33. <https://doi.org/10.1080/03610918.2026.2689450>
2. Dalai, J. and Singh, S. K. *E-Bayesian Estimation of Arrival and Service Rates in an M/M/1 Queueing System*. Asian Journal of Probability and Statistics, 28 (5), 31–45.
3. Barik, S., Banik, A. D., Chaudhry, M. L. and Singh, S. K. (2025). *Computational Procedure for System Length and Waiting-time Distribution in an $M^X/D/c/N$ Queue*. Indian J Pure Appl Math 56, 973–988. <https://doi.org/10.1007/s13226-025-00814-5>
4. Singh, S. K., Aguirre, J. F. R. and Cruz, F. R. B. (2025). *Estimating changes in traffic intensity for Markovian finite queueing systems: a Bayesian perspective*. International Journal of System Assurance Engineering and Management, 16, 2467–2479. <https://doi.org/10.1007/s13198-025-02791-8>
5. Gomes, E. S., Cruz, F. R. B., Quinino, R. C., and Singh, S. K. (2025). *Performance measure estimations in Erlang single server queues*. Communications in Statistics - Simulation and Computation, 1–14. <https://doi.org/10.1080/03610918.2025.2501750>
6. Hendi, M.K., Qomi, M.N., Singh, S.K. (2024). *E-Bayesian and Hierarchical Bayesian Estimation of Traffic Intensity in the M/M/1 Queueing System*. American Journal of Mathematical and Management Sciences, pp. 1–10.
7. Singh, S.K., Cruz, G.M.B., Cruz, F.R.B. (2024). *Change point estimation of service rate in M/M/1/m queues: A Bayesian approach*. Applied Mathematics and Computation, 465, 128423.

8. Singh, S.K., Cruz, F.R.B., Gomes, E.S., Banik, A.D. (2024). *Classical and Bayesian estimations of performance measures in a single server Markovian queueing system based on arrivals during service times*. Communications in Statistics – Theory and Methods, 53, 3517–3546.
9. Gomes, E.S., Cruz, F.R.B., Singh, S.K. (2023). *Algorithms for determination of sample sizes for Bayesian estimations in single-server Markovian queues*. American Journal of Mathematical and Management Sciences, 42, 307–322.
10. Singh, S.K., Acharya, S.K., Cruz, F.R.B., Cançado, A.L.F. (2023). *Change point estimation in an $M/M/2$ queue with heterogeneous servers*. Mathematics and Computers in Simulation, 212, 182–194.
11. Singh, S.K. (2023). *Maximum Likelihood Estimation in Single Server Queues*. Sankhya A, 85, 931–947.
12. Singh, S.K., Acharya, S.K., Cruz, F.R.B., Quinino, R.C. (2023). *Bayesian inference and prediction in an $M/D/1$ queueing system*. Communications in Statistics – Theory and Methods, 52, 8844–8864.
13. Singh, S.K. (2022). *Change point problem for Markovian arrival queueing models: Bayes factor approach*. International Journal of System Assurance Engineering and Management, 13, 2847–2854.
14. Singh, S.K., Acharya, S.K. (2022). *A Bayesian inference to estimate change point for traffic intensity in $M/M/1$ queueing model*. Opsearch, 59, 166–206.
15. Singh, S.K., Acharya, S.K., Cruz, F.R.B., Quinino, R.C. (2021). *Estimation of traffic intensity from queue length data in a deterministic single server queueing system*. Journal of Computational and Applied Mathematics, 398, 113693.
16. Singh, S.K., Acharya, S.K., Cruz, F.R.B., Quinino, R.C. (2021). *Bayesian sample size determination in a single-server deterministic queueing system*. Mathematics and Computers in Simulation, 187, 17–29.
17. Singh, S.K., Acharya, S.K. (2021). *ε -Upper and Lower Class Functions for the Maximum Likelihood Estimator for Single Server Queues*. International Journal of Mathematics and Statistics, 22, 73–86.
18. Cruz, G.M.B., Singh, S.K. (2021). *A discrete event simulation algorithm to finite single-server Markovian queues*. Proceedings of the XXVII Symposium of Production Engineering (SIMPEP), pp. 1–11.
19. Singh, S.K., Acharya, S.K. (2021). *On the Rate of Convergence in the Bernstein–von Mises Theorem for $M/M/1$ Queue*. Journal of the Indian Society for Probability and Statistics, 22, 181–200.
20. Singh, S.K., Acharya, S.K. (2021). *Bernstein–von Mises theorem and Bayes estimation from single server queues*. Communications in Statistics – Theory and Methods, 50, 286–296.
21. Singh, S.K. (2020). *Moderate deviation for maximum likelihood estimators from single server queues*. Probability, Uncertainty and Quantitative Risk, 5, 1–13.
22. Acharya, S.K., Singh, S.K., Villarreal-Rodríguez, C.E. (2020). *Asymptotic study on change point problem for waiting time data in a single server queue*. International Journal of Management Science and Engineering Management, 15, 39–46.
23. Singh, S.K. (2019). *Bayesian estimation of change point for traffic intensity in $M/M/1$ queueing model under different loss function by using quasi prior*. Queueing Models and Service Management, 2, 112–113.
24. Singh, S.K., Acharya, S.K. (2019). *Equivalence between Bayes and the maximum likelihood estimator in $M/M/1$ queue*. Communications in Statistics – Theory and Methods, 48, 4780–4793.
25. Singh, S.K., Acharya, S.K. (2019). *Bayesian change point problem for traffic intensity in $M/E_r/1$ queueing model*. Japanese Journal of Statistics and Data Science, 2, 49–70.
26. Singh, S.K., Acharya, S.K. (2019). *Asymptotic properties of maximum likelihood estimators from single server queues: A martingale approach*. Communications in Statistics – Theory and Methods, 48, 3549–3557.
27. Singh, S.K., Acharya, S.K. (2019). *Normal approximation of posterior distribution in $GI/G/1$ queue*. Journal of the Indian Society for Probability and Statistics, 20, 51–64.

28. Singh, S.K., Acharya, S.K. (2018). *Upper and Lower Class Functions for Maximum Likelihood Estimator for Single Server Queues*. Journal of the Indian Statistical Association, 56, 95–110.
29. Singh, S.K., Acharya, S.K. (2017). *Bayesian Change Point Problem for Erlang Inter Arrival Time Distribution*. Journal of Statistics and Mathematical Engineering, 3, 1–8.

List of PG Dissertations Supervised

1. Sanjana Soni (2026). *Forecasting Gold Prices in India Using ARIMA and Machine Learning Techniques*. (Enrollment No.: 24MST005)
2. Barsharani Baral (2026). *Forecasting Brinjal Prices in Odisha: A Machine Learning Approach*. (Enrollment No.: 24MST014)
3. Silpa Suman Sahoo (2026). *Forecasting Area, Yield, and Production of Cotton in Odisha Using ARIMA and Machine Learning Techniques*. (Enrollment No.: 24MST018)
4. Subhashree Maharana (2026). *Smart Loan Decision System Using Machine Learning Techniques*. (Enrollment No.: 24MST020)
5. Sucharita Pujari (2025). *Forecasting GDP in India Using Classical and Bayesian Autoregressive Models with Heavy-Tailed Errors*. (Enrollment No.: 23MST005)
6. Jayashree Sethi (2025). *Forecasting of Indian Coal Mine Fatal Accident Using ARIMA Model*. (Enrollment No.: 23MST008)
7. Nishant Rana (2024). *A Study on Impact of UPI Transactions: With Reference to Cuttack City*. (Enrollment No.: 22MST019)
8. Lipika Rani Patra (2023). *Use of Technology after COVID-19 Pandemic in Ravenshaw University*. (Enrollment No.: 21MST002)
9. Sourabha Kumar Behera (2023). *Classifying the Air Pollutant Using Clustering Technique*. (Enrollment No.: 21MST011)
10. Suvasmita Swain (2023). *The Use of Social Media and its Influence on the Students of Ravenshaw University Outside of the Classroom*. (Enrollment No.: 21MST019)
11. Mausumi Dutta (2022). *The Impact of the COVID-19 Pandemic and Associated Suppression Measures on the Burden of Tuberculosis in India*. (Enrollment No.: 20MST014)
12. Jayashree Das (2022). *Awareness of Risk Factor for Skin Infection among the Girls' Students Residing in the Hostels*. (Enrollment No.: 20MST016)

Faculty Development Programmes / Workshops

1. Inter/Multidisciplinary Refresher Course in Research Methodology and Statistical Analysis, UGC-MMTTC, Ranchi University, June 24–July 7, 2025 (Two weeks).
2. Hands-on Training Programme of ZBSA/PFMS, State NSS Cell, Department of Higher Education, Government of Odisha, May 23, 2025 (One day).
3. International Workshop on Bayesian Frontiers: Unveiling the Future of Statistical Modeling and Inference, Department of Statistics, DST-CIMS & Mahila Mahavidyalaya, Banaras Hindu University, January 03–05, 2025 (Three days).
4. Problem Solving Using Design of Experiments (DoE-09), Indian Statistical Institute, Bangalore, August–September, 2024 (Four days).
5. Online Short-Term Training Program (STTP) on Data Science and Statistical Analysis through R and Python Software 2.0, Centre for Continuing Education (CCE), SVNIT Surat, Gujarat, May 29–June 02, 2024 (One week).
6. One-Day National Workshop on Uses of Census Data in Social Science Research, P.G. Department of Population Studies, Fakir Mohan University, Balasore, Odisha, April 24, 2024 (One day).

7. NSS Empanelled Training Institute, NSS ETI OUAT, Bhubaneswar, Odisha, February 06–12, 2024 (One week).
8. Faculty Induction Programme, Jawaharlal Nehru University, November 22–December 20, 2023 (Four weeks).
9. MATLAB for Beginners, Human Resource Development Centre, Fakir Mohan University, Balasore, Odisha, April 03–07, 2023 (One week).
10. Copy-Paste Saga of Infringement: Basics of Similarity Detection and Prevention of Plagiarism, Human Resource Development Centre, Fakir Mohan University, Balasore, Odisha, October 18, 2022 (One day).
11. Two-Day National e-Workshop on Research and Publication Ethics, P.G. Department of Population Studies, Fakir Mohan University, Balasore, Odisha, April 29–30, 2022 (Two days).
12. Two-Day Training Programme on Design and Development of Contents and Proposals for SWAYAM, Ravenshaw University, Cuttack, Odisha, April 05–06, 2022 (Two days).

Awards and Recognitions

1. Best Record of Publications (2023–24), Ravenshaw University, Cuttack.
2. Dynamic Teacher of the Year (2022), Kiteskraft Production, SCF 126, Urban Estate Phase 1, Jamalpur, Ludhiana, Punjab.
3. Popular Personality Award (2022), St. Xavier's High School, Bilahat, Mahammad Pur, Cuttack.

Papers Presented in Conferences/Seminars

1. Classical and Bayesian Estimation of Traffic Intensity in an M/M/1 Queueing System Based on the Customers Served During a Busy Period, National Conference on Statistics and Data Science: Empowering Society Through Data, Department of Statistics, Utkal University, National.
2. Introduction to Markov Chains: Predicting the Future with Probability, Autonomy Seminar, Department of Statistics, Salipur Autonomous College, Salipur, College Level.
3. Estimating Change Point in Traffic Intensity for an M/D/1 Queueing Model, International Conference on Recent Developments in the Techniques of Bayesian Paradigm, Department of Statistics, Institute of Science, Banaras Hindu University, International.
4. Bayesian Estimation of Change Point in Traffic Intensity for M/M/1 Queueing Model under Conjugate Prior, Odisha Research Conclave, Odisha State Higher Education Council and Fakir Mohan University, Balasore, Odisha, National.
5. Bayesian Estimation of Change Point in the Single Server Queueing System, International Conference on Innovative Trends in Statistics, Optimization and Data Science (IC-ITSODS-2024), Department of Statistics and Operational Research, Kurukshetra University, Haryana, International.
6. Globalization and Indigenous Communities in India: Locating Social Change Approach in Niyamgiri, Indian Sociological Society 49th All India Sociological Conference, BML Munjal University, Haryana, National.
7. Testing of Hypothesis (Large Sample Test), Department Seminar, Udayanath Autonomous College of Science & Technology, Adaspur, College Level.
8. Change Point Problem in an Open Jackson Queueing Network, National Conference on Statistics and Data Science for Progress and Prosperity, Department of Statistics, Utkal University, National.
9. Bayesian Inference to Estimate Traffic Intensity in M/E_k/1 Queues, National Conference on Recent Developments in Data Science and 51st Convention of Odisha Mathematical Society, P.G. Department of Mathematics, Fakir Mohan University, Balasore, Odisha, National.
10. Classical and Bayesian Estimation of Performance Measure in Erlang Single Server Queues, International Conference on Operation Research and Game Theoretic Approach in Decision Making, Indian Statistical Institute, Delhi, International.

11. Globalization, Livelihood and Crises: A Case Study of Trafficking among Indigenous Women of Sundergarh, Indian Sociological Society 48th All India Sociological Conference, Vellore Institute of Technology, Vellore, National.
12. Globalization and Changing Pattern of Livelihood: A Sociological Understanding of Trafficking among Indigenous Communities of Sundargarh, Odisha, UIAF World Anthropology Congress Post-Congress Conference, Department of Anthropology, Sambalpur University and Gangadhar Meher University, National.
13. Digitalization of Education and its Challenges in Indian Society: A Sociological Analysis of Odisha, Indian Economic Association Annual International Conference on Post-Pandemic Economic Recovery of India: Policies and Challenges, Department of Social Science, Fakir Mohan University, Balasore, Odisha, International.
14. Educational Accessibility by Scheduled Castes in Indian Society: Contemporary Issues and Challenges, Education Outside the Classroom, Department of Humanities and Social Sciences in collaboration with Teaching Learning Centre, K.K. Birla Goa Campus, International.
15. Impact of Digital Payments on Waiting Time of Customer in Supermarket, International Conference on Digital India: A New Initiative for Development, Department of Social Science, Fakir Mohan University, Balasore, Odisha, International.
16. Bayesian Control Chart for Monitoring Traffic Intensity in a Single Server Markovian Queueing System, International Conference on Applied Mathematics (ICAM-2022), Department of Applied Mathematics, Vidyasagar University, Midnapore, West Bengal, India, International.

Invited Lectures / Academic Sessions

1. Introduction to Markov Chains: Predicting the Future with Probability, Autonomy Seminar, Department of Statistics, Salipur Autonomous College, Salipur, State Level.
2. Testing of Hypothesis (Large Sample Test), Department Seminar, Udayanath Autonomous College of Science & Technology, Adaspur, State Level.
3. Estimation of Parameters in Various Queueing Models, Departmental Seminar, School of Basic Science, IIT Bhubaneswar, State Level.
4. Change Point Problem in M/M/1 Queue, New Age Statistics for Data Science and Artificial Intelligence, Department of Statistics, Ravenshaw University, Cuttack, State Level.

Academic and Administrative Activities

1. NSS Program Officer (2023 – Continue)
2. Assistant Professor In-Charge, Kanika Library (2022 – Continuing)
3. Deputy Warden, Jagannath Chhatrabas Hostel (2022 – Continuing)
4. Member, University Calendar Publication (2025)
5. Member of Academic Bodies (BOS, DPAC) (2022 – Continuing)
6. Department Time Table Preparation (2025 – Continue)
7. Syllabus Preparation (Department) (2022–Continuing)
8. Admission in Charge (UG, PG, PhD), Department of Statistics (2022–2024)
9. Admission in Charge (PG, PhD), Department of Statistics (2025 – Continue)
10. Department AQAR / NAAC Institutional Documentation Work (2022 and 2025–Continuing)
11. Co-convenor, Department Level National Seminar (2022)