DR. JOY BOSE

Senior Data Scientist | Independent Researcher | Author
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Google Scholar: 707 citations, h-index 13 | ORCID: 0000-0002-6717-2187

RESEARCH PROFILE

Senior ML/AI systems researcher and practitioner with a PhD in neuromorphic computing (University of Manchester) and over 15 years of experience in machine learning and AI. Specialises in large language models, RAG architectures, knowledge graphs, and MCP-based agentic systems. Co-inventor on 8 granted US/European patents with 20+ additional filings; author of 50+ peer-reviewed publications spanning spiking neural networks, telecom AI, educational data mining, and neurosymbolic systems. Active independent researcher, writer, and publisher, with parallel expertise in neuroscience, law, and contemplative studies.

EDUCATION

PhD, Computer Science (Spiking Neural Networks) *2002–2007*

University of Manchester, United Kingdom

Supervisor: Prof. Steve Furber (creator of the ARM processor; SpiNNaker project). Overseas Research Studentship (full funding, 3 years). Thesis: Engineering a Sequence Machine Through Spiking Neurons Employing Rank-Order Codes. 3 international + 3 UK conference papers + 1 IEEE journal paper.

LLM, International Business and Finance Law — Summa Cum Laude, GPA 4.0 *2024–2025*

Golden Gate University, San Francisco, USA (online)

MSc, Psychology and Neuroscience of Mental Health (Merit) *2021–2023*

King's College London, United Kingdom

Dean's Award for Outstanding Student Performance in Mental Health in the Community.

BE (Hons, 1st Class), Computer Science — 82.04% aggregate *1998–2002*

MNNIT Allahabad (Motilal Nehru National Institute of Technology), India

Merit scholarship (3 years); NTSE Scholarship; TCS scholarship (HiPC 2001).

PROFESSIONAL EXPERIENCE

Senior Data Scientist | Ericsson Global, Bengaluru *Jul 2020 – Present*

- Built NLP-to-SQL system with RAG for telecom data access, eliminating manual query bottlenecks across multiple teams.
- Developed LLM-based automated Java code review pipeline (open-source Llama models) adopted by ~400 engineers across the BCSS organisation, saving ~20 minutes per review cycle.
- Designed knowledge graph + LLM solution (FalkorDB, MCP-based) for intelligent code understanding and log querying via OpenSearch; adopted by 1,000+ engineers across multiple BCSS teams.
- Applied ML to identify inefficient radios for energy savings, predict trouble ticket resolutions, and categorise financial variance for CSP clients.
- Conducted comparative ML cost analysis across Azure and AWS; published Ericsson blog on AI-driven BSS financial data categorisation.
- 1 granted EPO/WIPO patent, 3 further patents filed; 6 papers published including 1 journal paper (IJMEMS 2025).
- Awards: Power Award (Individual) 2022; Act to Accelerate Award (Team) 2021; AllStars Gold Award 2024.

Lead Data Scientist | Jio Embibe, Bengaluru *Jan 2020 – Jun 2020*

- Built ML models to analyse and improve student performance in standardised exams.
- Developed nudge generation system for personalised learning outcomes.
- Paper published at Educational Data Mining (EDM) 2020 on auto-generation of diagnostic assessments.

Senior Software Development Engineer | Microsoft India (Edge Team), Hyderabad *Aug 2018 – Dec 2019*

- Trained ML model for relevant image extraction in Edge reading view using Bing's Virtual DOM.
- Built client-side neural network for web form field classification (autofill).
- 1 US patent granted; 1 paper at IEEE INDICON 2019; presented at Microsoft MLADS SYNAPSE 2019.

Senior Chief Engineer, Data Intelligence Group | Samsung R&D, Bengaluru *Nov 2011 – Aug 2018*

- Led 4-member team on calendar event classification and personalised recommendation system with 94% accuracy across English and Korean.
- Research PoCs: EEG attention mapping to web DOM elements (Neurosky BCI); real-time news bias detection; web push notification CTR prediction; gesture-based SMS encryption via heteroassociative neural networks.
- Mentored interns, freshers, and first-time inventors; taught internal Data Structures and Algorithms courses.
- Awards: Star IP Award 2013; Best Paper ×2 (INDICON 2015, IEEE DISCOVER 2016); Tech Paper Shepherd Award 2017; Top 10 finalist, C-Lab Intrapreneurship 2017.

Software Engineer | Digital Applications International (now Dematic), Stockport, UK *Oct 2007 – Oct 2011*

- Software development for logistics Warehouse Management Systems (Matflow) for clients including Asda/Walmart, Screwfix, B&Q, Lever Fabergé.

TECHNICAL SKILLS

AI / ML: LLMs, RAG, Agentic systems (MCP), Knowledge Graphs, LLMOps, Prompt Engineering, Transformers, LangChain, Spiking Neural Networks, SVM, FastText, Recommender Systems, Supervised/Unsupervised Learning, Neuromorphic Computing

Cloud & MLOps: Azure ML, AWS SageMaker, Amazon Q, OpenSearch, FalkorDB

Languages: Python (10+ yrs), Java (10+ yrs), C (15+ yrs), C++ (2 yrs), MATLAB (5 yrs)

Domains: Telecom (BSS/OSS), EdTech, Browser Intelligence, Neuroscience & BCI, Logistics, Legal

PUBLICATIONS

Total: 50+ indexed publications | 707 citations | h-index: 13 (Google Scholar, May 2026)
Full list: https://scholar.google.com/citations?user=1E0YgA4AAAAJ | https://dblp.org/pid/84/5687

A. Peer-Reviewed Journal Articles

[J1] Furber S.B., Brown G., Bose J., Cumpstey J.M., Marshall P., Shapiro J.L. Sparse Distributed Memory Using Rank-Order Neural Codes. IEEE Transactions on Neural Networks, 18(3):648–659, 2007. DOI: 10.1109/TNN.2006.890804

[J2] Singla K., Bose J., Varshney N. Word Embeddings for IoT Based on Device Activity Footprints. Computación y Sistemas, 23(3), 2019. DOI: 10.13053/CYS-23-3-3276

[J3] Bandyopadhyay S., Bose J., Roychowdhury S. A Hybrid Framework for Real-Time Data Drift and Anomaly Identification Using Hierarchical Temporal Memory and Statistical Tests. International Journal of Mathematical, Engineering and Management Sciences (IJMEMS), 10(3), 2025. DOI: 10.48550/arXiv.2504.18599

B. PhD Thesis

[T1] Bose J. Engineering a Sequence Machine Through Spiking Neurons Employing Rank-Order Codes. PhD Thesis, University of Manchester, UK, 2007. Supervisor: Prof. Steve Furber. British Library EThOS: uk.bl.ethos.789385

C. Peer-Reviewed Conference Papers (selected confirmed entries)

[c52] Bose J., Adyapak S. A Survey of Security, Privacy, and Ethics of Large Language Models in Telecom. COMSNETS 2026, pp. 1100–1104. DOI: 10.1109/COMSNETS67989.2026.11418201

[c51] Ramesh S., Bose J., Singh H., Raghavan A.K., Roy Chowdhury S., Sridhara G., Saini N., Britto R. Automated Code Review Using Large Language Models at Ericsson: An Experience Report. ICSME 2025, pp. 602–607. DOI: 10.1109/ICSME64153.2025.00061

[c50] Chowdhury S.R., Sridhara G., Raghavan A.K., Bose J., Mazumdar S., Singh H., Sugumaran S.B., Britto R. Static Program Analysis Guided LLM Based Unit Test Generation. COMAD/CODS 2024, pp. 279–283. DOI: 10.1145/3703323.3703742

[c49] Pardhasaradhi N., Bose J., Vikram A., Verma A., Jain M. Identification of Inefficient Radios for Efficient Energy Consumption in a Mobile Network. COMSNETS 2024, pp. 608–612. DOI: 10.1109/COMSNETS59351.2024.10426851

[c48] Banerjee S., Bose J., Puthepurakel S.P., Uppuluri P.K., Bandyopadhyay S., Reddy Y.S.K., Gireesha R.H. Link-Adaptation for Improved Quality-of-Service in V2V Communication using Reinforcement Learning. AIMLSystems 2022, pp. 1:1–1:7. DOI: 10.1145/3564121.3564122

[c47] Bose J., Gireesha R.H., Banerjee S., Umaashankar V. Prediction of Throughput Degradation from Trouble Frequencies, given Environmental Unknowns. COMSNETS 2022, pp. 236–240. DOI: 10.1109/COMSNETS53615.2022.9668474

[—] Dhavala S.S., Bhatia C., Bose J., Faldu K., Avasthi A. Auto Generation of Diagnostic Assessments and Their Quality Evaluation. EDM 2020, pp. 730–735.

[—] Patankar A.A., Bose J., Khanna H. A Bias Aware News Recommendation System. IEEE ICSC 2019, pp. 232–238. DOI: 10.1109/ICOSC.2019.8665610

[—] Bose J. Extraction of Relevant Images for Boilerplate Removal in Web Browsers. IEEE INDICON 2019.

[—] Patankar A.A., Bose J. Bias Based Navigation for News Articles and Media. NLDB 2016, Springer LNCS vol. 9612, pp. 465–470. DOI: 10.1007/978-3-319-41754-7_50

[—] Bose J. et al. Attention Sensitive Web Browsing. ACM Compute 2016.

[—] Bose J. et al. A Hands Free Browser Using EEG and Voice Inputs. IJCNN 2015. DOI: 10.1109/IJCNN.2015.7280378

[—] Bose J. et al. A Web Browser Responsive to the User Interest Level. IEEE INDICON 2015. [Best Paper Award, Track 4]

[—] Bansal D., Bose J. et al. EEG Based Detection of Area of Interest in a Web Page. ICACCI 2015.

Note: DBLP records c1–c52. One CCNC 2020 entry (c46, DOI: 10.1109/CCNC46108.2020.9045128) has a placeholder title — verify via DOI. Remaining earlier entries (c1–c45 in DBLP) are not listed here pending title verification. Full list at dblp.org/pid/84/5687.

C. Preprints / Technical Reports (arXiv)

[P1] Roychowdhury S., Sridhara G., Raghavan A.K., Bose J., Mazumdar S., Singh H., Sugumaran S.B., Britto R. Static Program Analysis Guided LLM Based Unit Test Generation. CoRR arXiv:2503.05394 (2025).

[P2] Bandyopadhyay S., Bose J., Roychowdhury S. A Hybrid Framework for Real-Time Data Drift and Anomaly Identification Using Hierarchical Temporal Memory and Statistical Tests. CoRR arXiv:2504.18599 (2025).

[P3] Ramesh S., Bose J., Singh H., Raghavan A.K., Roychowdhury S., Sridhara G., Saini N., Britto R. Automated Code Review Using Large Language Models at Ericsson: An Experience Report. CoRR arXiv:2507.19115 (2025).

[P4] Saragadam H., Nayak C.K., Bose J. A Scalable and High Availability Solution for Recommending Resolutions to Problem Tickets. CoRR arXiv:2507.19846 (2025).

[P5] Morri S., Bose J., Reddy L.R., Anamandra S.H. Predicting Locations of Cell Towers for Network Capacity Expansion. CoRR arXiv:2507.19925 (2025).

[P6] Bose J. Pendulum Model of Spiking Neurons. CoRR arXiv:2507.22146 (2025).

PATENTS

8 granted (US and European); 20+ filed/pending. Co-inventor on all listed below.
Samsung Star IP Award 2013 for patent contributions.

A. Granted Patents

[P1] **EP3750115B1 —** *Machine Learning on a Blockchain* (2021)

[P2] **US11295492B2 —** *Electronic Device Related to Rendering of Web Content* (2022)

[P3] **US11030448B2 —** *Method for Recommending One or More Actions (Mobile Device)* (2021)

[P4] **US10235587B2 —** *System for Optimizing Image Capturing Boundary* (2019)

[P5] **US10210598B2 —** *Electronic Device for Displaying and Processing Images* (2019)

[P6] **US9992254B2 —** *Method for Providing a Web Feed in a URI* (2018)

[P7] **US12591731B2 —** *System and Method for Selecting Relevant Content in an Enhanced View Mode* (2025)

[P8] **EP4331295B1 —** *Reducing Interference in a Communications Network* (2024)

B. Patent Applications Filed (Selected — EPO / WIPO / USPTO)

Three patent applications filed at Ericsson (EPO/WIPO, 2021–2024) covering AI-assisted network management, automated code analysis, and intelligent log querying. Full list of 20+ applications available on request and via Google Patents (inventor: Joy Bose).

AWARDS & HONOURS

- Ericsson Power Award (Individual), 2022
- Ericsson Act to Accelerate Award (Team), 2021
- Ericsson AllStars Gold Award, 2024
- Samsung Star IP Award, 2013 — for patent contributions
- Best Paper Award — IEEE INDICON 2015
- Best Paper Award — IEEE DISCOVER 2016
- Tech Paper Shepherd Award — Samsung, 2017
- Top 10 Finalist — Samsung C-Lab Intrapreneurship, 2017
- Dean's Award for Outstanding Student Performance — King's College London, 2022/23
- Overseas Research Studentship (full doctoral funding) — University of Manchester, 2002–2005
- Merit Scholarship (3 years) & NTSE Scholarship — MNNIT Allahabad, 1998–2002
- TCS Scholarship — HiPC 2001

OTHER ACADEMIC & PROFESSIONAL ACTIVITIES

Books Authored

- "Building Consciousness: Buddhism, Neuroscience, and the Design of Sentient Machines" (Notion Press / Draft2Digital, 2024)

Invited Talks & Presentations

- Microsoft MLADS SYNAPSE 2019 — Presentation on edge ML and form field classification
- Multiple internal invited talks at Ericsson, Samsung, and Microsoft on ML and AI topics

Volunteering & Community

- NIMHANS Bengaluru — Certified Wellbeing Volunteer
- Google Local Guides India — Level 10

Interests

AI ethics; neuroscience–AI intersection; computational neuroscience; contemplative philosophy and Buddhist psychology; interfaith studies; Indian and international law.

ACADEMIC PROFILES

Google Scholar: https://scholar.google.com/citations?user=1E0YgA4AAAAJ
DBLP: https://dblp.org/pid/84/5687
ORCID: https://orcid.org/0000-0002-6717-2187
ACM Digital Library: https://dl.acm.org/profile/87058721157
LinkedIn: https://linkedin.com/in/joyboseroy
GitHub: https://github.com/joyboseroy