

Somnath Banerjee (Som)

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🌐 LinkedIn profile

📄 Google scholar

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👤 Over 10 years of experience in the IT industry, with ~ 7 years specializing in AIML.



Education

- 2021 – Till 📖 **PhD, Indian Institute of Technology, Kharagpur, India**
in **Computer Science and Engg.** under the guidance of **Prof. Animesh Mukherjee**.
Area of interest: *Information Retrieval, Explainable AI, Large Language Model, Natural Language Processing, Deep Learning and Graph learning.*
- 2016 – 2019 📖 **M.Tech, Indian Institute of Technology (Indian School of Mines), Dhanbad, India**
in **Computer Science and Engg.** under the guidance of **Prof. Rajendra Pamula**.
Thesis title: *Random Forest boosted CNN: An empirical technique for plant classification.*
Position: University **Gold Medal**.
- 2010 – 2014 📖 **B.Tech, West Bengal University of Technology, India**
in **Computer Science and Engg.** under the guidance of **Dr. Sanjib Saha**.
Project title: *Weka-Driven Insights: Assessing the Performance of Clustering Algorithms.*
Position: Among top 10.

Employment History

- 2023 – Till 📖 **Software Engineering Technical Leader** at Cisco Systems.
- 2020 – 2023 📖 **Senior Software Consultant** at Fujitsu, Australia/India.
- 2016 – 2020 📖 **Technical Lead** at Cognizant, Australia.
- 2014 – 2016 📖 **Senior Software Engineer** at IBM, India.


Internships and Grants

- 2013 📖 Chemo Informatics based on organic elements and Computer science from *Central Mechanical Engineering Research Institute (CMERI), India* under guidance of Dr. B N Mondal.
- 2024 📖 Received the prestigious **Microsoft Academic Partnership Grant (MAPG) 2024** in collaboration with Prof. Animesh Mukherjee from IIT Kharagpur. Our proposal is among just **six** selected across India.
- 📖 Received the prestigious **PaliGemma Academic Program GCP Credit Award** from Google.

Research Publications

Conference Proceedings

- 1 Somnath Banerjee and Rajendra Pamula. “Random Forest Boosted CNN: An Empirical Technique for Plant Classification”. In: (*accepted at GAIC*). Ed. by Jyotsna Kumar Mandal and Somnath Mukhopadhyay. Singapore: Springer Singapore, 2020, pp. 251–261. ISBN: 978-981-15-2188-1. [Unranked].
- 2 Somnath Banerjee et al. “Context Matters: Pushing the Boundaries of Open-Ended Answer Generation with Graph-Structured Knowledge Context”. In: (*accepted at EMNLP*). 2024. [Core A*]. arXiv: 2401.12671 [cs.CL].

- 3 Somnath Banerjee et al. “DistALANER: Distantly Supervised Active Learning Augmented Named Entity Recognition in the Open Source Software Ecosystem”. In: (*accepted at ECML PKDD*). Ed. by Albert Bifet et al. Cham: Springer Nature Switzerland, 2024, pp. 313–331. ISBN: 978-3-031-70381-2. [Core A].
- 4 Somnath Banerjee et al. “Exploring Transformer Based Models to Identify Hate Speech and Offensive Content in English and Indo-Aryan Languages”. In: (*accepted at FIRE*). 2021. [Competition][Rank 1]. eprint: 2111.13974 (cs.CL).
- 5 Somnath Banerjee et al. “How (un)ethical are instruction-centric responses of LLMs? Unveiling the vulnerabilities of safety guardrails to harmful queries”. In: (*accepted at AAAI Conference on Web and Social Media (ICWSM)*). 2024. [Core A]. arXiv: 2402.15302 [cs.CL].
- 6 Somnath Banerjee et al. “InfFeed: Influence Functions as a Feedback to Improve the Performance of Subjective Tasks”. In: (*accepted at COLING*). Ed. by Nicoletta Calzolari et al. Torino, Italia: ELRA and ICCL, May 2024, pp. 9061–9072. [Core B].
- 7 Somnath Banerjee et al. “Navigating the Cultural Kaleidoscope: A Hitchhiker’s Guide to Sensitivity in Large Language Models”. In: (*accepted at NAACL*). 2025. [Core A*]. arXiv: 2410.12880 [cs.CL].  URL: <https://arxiv.org/abs/2410.12880>.
- 8 Somnath Banerjee et al. “Redefining Developer Assistance: Through Large Language Models in Software Ecosystem”. In: (*accepted at WebSci [Withdrawn]*). 2023. [Core B]. arXiv: 2312.05626 [cs.SE].
- 9 Somnath Banerjee et al. “SafeInfer: Context Adaptive Decoding Time Safety Alignment for Large Language Models”. In: (*accepted at AAAI*). 2025. [Core A*]. arXiv: 2406.12274 [cs.CL].
- 10 Mithun Das, Somnath Banerjee, and Animesh Mukherjee. “Data Bootstrapping Approaches to Improve Low Resource Abusive Language Detection for Indic Languages”. In: (*accepted at HyperText(HT)*). HT ’22. Barcelona, Spain: Association for Computing Machinery, 2022, pp. 32–42. ISBN: 9781450392334. [Core A].  DOI: 10.1145/3511095.3531277.
- 11 Mithun Das, Somnath Banerjee, and Animesh Mukherjee. “hate-alert@DravidianLangTech-ACL2022: Ensembling Multi-Modalities for Tamil TrollMeme Classification”. In: (*accepted at ACL Workshop*). Dublin, Ireland: Association for Computational Linguistics, May 2022. [Core A*].  DOI: 10.18653/v1/2022.dravidianlangtech-1.8.
- 12 Mithun Das, Somnath Banerjee, and Punyajoy Saha. “Abusive and Threatening Language Detection in Urdu using Boosting based and BERT based models: A Comparative Approach”. In: (*accepted at ODS.AI*). 2021. [Competition][Rank 1]. eprint: 2111.14830 (cs.CL).
- 13 Mithun Das et al. “Hate Speech and Offensive Language Detection in Bengali”. In: (*accepted at AACL-IJCNLP*). Association for Computational Linguistics, 2022. [Core B].
- 14 Vikram Gupta et al. “Multilingual Abusive Comment Detection at Scale for Indic Languages”. In: (*accepted at NeurIPS*). Ed. by S. Koyejo et al. Vol. 35. Curran Associates, Inc., 2022, pp. 26176–26191. [Core A*].
- 15 Rima Hazra et al. “Duplicate Question Retrieval and Confirmation Time Prediction in Software Communities”. In: (*accepted at ASONAM*). 2023. [Core B]. arXiv: 2309.05035 [cs.IR].
- 16 Rima Hazra et al. “Evaluating the Ebb and Flow: An In-depth Analysis of Question-Answering Trends across Diverse Platforms”. In: (*accepted at IEEE BigData*). 2023. [Core B]. arXiv: 2309.05961 [cs.SI].
- 17 Rima Hazra et al. “Safety Arithmetic: A Framework for Test-time Safety Alignment of Language Models by Steering Parameters and Activations”. In: (*accepted at EMNLP*). 2024. [Core A*]. arXiv: 2406.11801 [cs.CL].  URL: <https://arxiv.org/abs/2406.11801>.
- 18 Rima Hazra et al. “Sowing the Wind, Reaping the Whirlwind: The Impact of Editing Language Models”. In: (*accepted at ACL*). Ed. by Lun-Wei Ku, Andre Martins, and Vivek Srikumar. Bangkok, Thailand and virtual meeting: Association for Computational Linguistics, Aug. 2024, pp. 16227–16239. [Core A*].

Experience as Research Scientist

Cisco Systems [Jan 2023 - Till]

- **Large Language Model Development:** Led the development and integration of GPT-based models into the company's customer service platform. Fine-tuned LLaMA for domain-specific customer support tasks, increasing resolution rates by 85%. The LLM models handled over 500,000 monthly customer queries, dynamically generating responses to complex questions.
- **Network Document Summarization System:** Designed and deployed a document summarization pipeline using Mistral for network document review, cutting down manual review times by 40%. Utilized a sequence-to-sequence transformer model to extract essential information from multi-page network contracts, improving contract processing throughput by 3x.
- **Custom Chatbot Development:** Built a robust conversational AI system using a ChatGPT architecture using RAG Fusion. This system significantly reduced call center dependency, handling ~ 1 million customer queries per month with a 90% accuracy rate in query understanding.
- **Fine-Tuning LLMs:** Spearheaded fine-tuning efforts for BERT, T5, and GPT-based models for NER and relation extraction tasks within the network and cloud based ITSM sectors. Achieved state-of-the-art performance metrics, including a 93% precision and 91% recall rate for custom entity extraction tasks, significantly outperforming baseline models.
- **Cloud Infrastructure for Model Deployment:** Deployed and optimized ML models on Cisco internal Runon and GCP AI Platform, leveraging auto-scaling capabilities to handle peak traffic loads of over 10,000 API requests per second. Improved inference latency by 20% through optimized load balancing and scaling strategies.
- **End-to-End NLP Pipelines:** Created end-to-end NLP solutions for customer sentiment analysis and text classification, processing over 10 million records annually. These systems enabled real-time monitoring of customer feedback, directly improving customer satisfaction metrics by 25%.

Fujitsu [May 2020 - Jan 2023]

- **Document Classification System:** Developed an automated document classification solution for internal compliance and auditing purposes. This system processed over 500,000 documents, classifying them with a 92% accuracy rate. The solution significantly improved compliance reporting efficiency by 30%.
- **Custom NER Models:** Led the development of a domain-specific NER system to extract financial and regulatory entities from large-scale legal filings. Leveraging BERT and custom embeddings, the system boosted entity extraction performance, reducing manual labor by 40%.
- **Fine-Tuned Transformer Models:** Fine-tuned transformer models like T5 and BERT for tasks such as contract analysis, customer feedback sentiment prediction, and multi-label classification. Achieved a model accuracy improvement of 18% compared to previous rule-based systems.

Experience as ServiceNOW Consultant

Cisco Systems [Jan 2023 - Till]

▪ **Transferring MNIS to ServiceNOW [ITBM, Portal]:**

- Working on Demand Management configurations from scratch along with custom solutions for separate process on Supplier work instruction and integrations with 3rd party tool named as MNIS. Configuration of REST Messages, Business Rules, Scheduled Jobs and Script Includes.
- Leading the development and deployment activities for the project.
- Automation of adding / removing members to/from a Distribution List via Integration Hub Configuration of Flows using Flow Designer.
- Performing Code Reviews, Unit Testing and Integration Testing.
- Demo to Business Stakeholders and facilitating User Acceptance Testing

Fujitsu [Feb 2020 - Jan 2023]

▪ **Leading Team for Telco Project [ITSM, ITOM, ITBM, Portal]:**

- Working on ITBM configurations along with custom application.
- Implementation of Visual Indicators to track business unit / department performance trend based on business defined KPIs using ServiceNow Performance Analytics.
- Mostly involved in gathering the requirements on service portal and implementing the best look and feel and user friendly for all the users throughout the organization which also involves the domain separation concept in different GDC structure within not more than 1.5 month.

Cognizant [May 2016 - Feb 2020]

▪ **Leading Team for Mining Project [ITSM, HAM, SAM, Portal]:**

- Gathering the requirement specifically on SLA from client and analyzing the feasibility of the requirement and alongside implementation singlehanded. Creating monthly report and project planning document for organization point of view.
- Focused on "inheritance" model because we have 4 clients in one platform. I have working with Dave Knight (Service Now Architect) in order to fix all the issues present in the instance in inheritance model. Implementing SAM Pro after implementation of HAM.
- Development and delivery of IT Services Management (ITSM) solutions based on ITIL best practices. Configuration and Administration of ServiceNow Infrastructure modules : UI configuration, workflow creation etc.

IBM [July 2014 - May 2016]



▪ **Active member for Banking Project [ITSM]:**

- Developed efficient and optimum algorithm for calculating cost for different combinations and it worked successfully in first chance. I was responsible for developing different functional Workflow. Involved most complex Report generation for every combination using code because of a huge table.
- Primarily Involved in developing various components of the Backend Engine built with JavaScript that drives the International Banking service forum. Developed email notification, Read-only, standards.

Skills










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|-----------------------|--|
| Languages | ▪ Strong reading, writing and speaking competencies for English and Bengali. Good speaking competencies for Hindi. |
| Programming Languages | ▪ Python, L ^A T _E X, Julia, Java, c. |

Skills (continued)







- Tools and Libraries  PyTorch, Tensorflow, Keras, SKlearn, WEKA, matlab.
- Misc.  Teaching, Research, Team Management.

Miscellaneous Experience


Volunteer Experience

-  Volunteer at ICNDE 2018, CoDS-COMAD 2019, ISCLS 2019, IndoML.
-  Area Chair at CoDS-COMAD 2021, COLING 2023.
-  Reviewer at TextGraph 2020, 2021, 2022, NeurIPS 2023, ICLR 2023, 2024.
-  Reviewer at ECML PKDD 2024.
-  Reviewer at EMNLP 2023, 2024.
-  Reviewer at ACL 2024.
-  Reviewer at AAAI 2024, 2025.
-  Subreviewer at JCDL 2021, 2022, PAKDD 2020.
-  Subreviewer at Frontiers in Physics 2021, IEEE/ACM Transactions on Networking 2021, AI-ML Systems 2020, Artificial Intelligence in Medicine 2019, IEEE Access 2019

Certification

-  Cisco Data Science Blue Belt 2024.
-  Data Science @Cisco Generative AI Blue Belt 2024.
-  Sun Certified Java Programmer (SCJP) 2013
-  Certified Application Developer ServiceNow 2018
-  Fujitsu Yearly Gold Award 2021
-  IBM best employee award 2015

Hobbies

-  Travel in Bike, Drawing, Watching motivational videos, Reading horror stories.

References

Prof. Animesh Mukherjee

Professor

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