

Dr. Snigdha Sen

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RESEARCH INTERESTS

Astroinformatics and astronomical big data; deep learning for photometric redshift estimation; explainable AI for space science; computer vision and image steganography; scalable machine learning on big-data platforms.

PROFILE AT A GLANCE

- About 16 years of teaching experience in computer science and engineering; PhD (2024) from IIIT Allahabad.
- 40+ publications in SCI/Scopus-indexed journals and conferences, including *New Astronomy*, *Experimental Astronomy*, *Signal, Image and Video Processing* and *Multimedia Tools and Applications*.
- Two patents in emergency-response systems; funded projects from VGST and KSCST.
- Guides 4 doctoral scholars at MAHE; has supervised 10+ M.Tech theses and 35+ undergraduate projects.
- Invited speaker at IUCAA Pune, ISRO ISTRAC and IIIT Allahabad.

ACADEMIC APPOINTMENTS

Senior Assistant Professor <i>Manipal Institute of Technology Bengaluru, MAHE</i> School of Computer Engineering; Research Coordinator.	Mar 2024 – present
Associate Professor <i>Global Academy of Technology, Bengaluru</i> Organised conferences, workshops and faculty development programmes; resource person for ML, deep learning, big data and cloud computing.	Aug 2011 – Feb 2024
Lecturer, Computer Science <i>Aryabhatta Institute of Engineering & Management, Durgapur</i> <i>Industry</i>	Jul 2005 – Jul 2007
Programmer Analyst Trainee <i>Cognizant Technology Solutions, Kolkata</i>	Feb 2010 – Jun 2010

EDUCATION

Ph.D., Data Science & Deep Learning <i>Indian Institute of Information Technology Allahabad</i> Supervisors: Prof. Pavan Chakraborty and Dr. Krishna Pratap Singh.	2019 – 2024
M.Tech., Information Technology <i>Jadavpur University, Kolkata</i>	2007 – 2009
B.E., Information Technology <i>University Institute of Technology, University of Burdwan</i>	2001 – 2005

PUBLICATIONS

Reverse chronological. Indexing shown where known. Full list with links: snigdhasen.in/publications

Journal Articles

- [1] A. Dabhade, S. Chakraborty, and **S. Sen**, “A novel block based preparation network using convolutional neural networks for image steganography and robust data protection,” *Multimedia Tools and Applications*, vol. 85, no. 5, art. 482, 2026. doi:10.1007/s11042-026-21652-5 [Scopus]

- [2] R. DSouza and **S. Sen**, "A SwinBERT framework with temporal windowed cross attention for video captioning for visual language intelligence," *Discover Applied Sciences*, vol. 8, no. 9, art. 947, 2026. doi:10.1007/s42452-026-09098-8
- [3] S. Nithya, S. Banerjee, **S. Sen**, and S. Senthil Kumar, "Explainable Deep Learning for Satellite Telemetry Anomaly Detection: A Systematic Literature Review," *IEEE Access*, 2026. doi:10.1109/ACCESS.2026.3745984 [SCIE, Scopus]
- [4] A. Sk, S. Chakraborty, and **S. Sen**, "A novel blocked based U-Net model for image steganography," *Multimedia Tools and Applications*, vol. 84, no. 36, pp. 45479–45498, 2025. doi:10.1007/s11042-025-20952-6 [Scopus]
- [5] S. Madhavi, D. Mahesh, N. V. Raju, **S. Sen**, and J. Johns, "Analysing and predicting dielectric properties of bamboo fiber filled polypropylene composites using artificial neural network," *Journal of the Indian Academy of Wood Science*, vol. 22, no. 1, pp. 37–49, 2025. doi:10.1007/s13196-024-00358-x [Scopus]
- [6] D. Mahesh, N. V. Raju, and **S. Sen**, "Machine learning approaches for predicting dielectric properties of banana fibers reinforced with polypropylene composites," *Multiscale and Multidisciplinary Modeling, Experiments and Design*, vol. 8, no. 1, art. 71, 2025. doi:10.1007/s41939-024-00666-2 [Scopus]
- [7] **S. Sen**, A. K. Pandit, P. Chakraborty, and K. P. Singh, "Performance evaluation of efficient interpretable CNN-transformer model for redshift prediction," *Signal, Image and Video Processing*, vol. 19, no. 4, art. 326, 2025. doi:10.1007/s11760-025-03855-9 [SCI, Scopus]
- [8] **S. Sen** and S. Banerjee, "Precise Image Segmentation using Explainable U-Net based Hybrid Approach for Improved Detection of Skin Lesion," *International Journal of Computing and Digital Systems*, vol. 18, no. 1, pp. 1–12, 2025. doi:10.12785/ijcds/1571149929
- [9] M. Doddashamachar, **S. Sen**, and R. Nama Vasudeva Setty, "A novel Artificial Neural Network-based model for predicting dielectric properties of banana fiber filled with polypropylene composites," *Journal of Thermoplastic Composite Materials*, vol. 36, no. 10, pp. 4106–4123, 2023. doi:10.1177/08927057221148455 [SCI, Scopus]
- [10] **S. Sen**, K. P. Singh, and P. Chakraborty, "Dealing with imbalanced regression problem for large dataset using scalable Artificial Neural Network," *New Astronomy*, vol. 99, art. 101959, 2023. doi:10.1016/j.newast.2022.101959 [SCI, Scopus]
- [11] **S. Sen**, S. Agarwal, P. Chakraborty, and K. P. Singh, "Astronomical big data processing using machine learning: A comprehensive review," *Experimental Astronomy*, vol. 53, no. 1, pp. 1–43, 2022. doi:10.1007/s10686-021-09827-4 [SCI, Scopus]
- [12] **S. Sen**, "Comparative Study of Methodologies for Home Automation System: A Survey," *International Journal of Computer Sciences and Engineering (IJCSE)*, 2019.
- [13] **S. Sen**, "Development of an IoT Based Shopping Trolley," *International Journal on Recent and Innovation Trends in Computing and Communication (IJRITCC)*, 2019.
- [14] **S. Sen**, "Development of an Exclusive Web Application for Family," *International Journal of Advanced Research in Computer Science*, 2018.
- [15] **S. Sen**, "Implementation of deduplication scheme for Encrypted Data in Cloud," *International Journal of Innovative Research in Computer and Communication Engineering (IJIRCC)*, 2017.
- [16] **S. Sen** and B. Madhu, "Smart agriculture: a bliss to farmers," *International Journal of Engineering Sciences & Research Technology*, vol. 6, no. 4, pp. 197–202, 2017.

Conference Proceedings

- [17] H. Alla, **S. Sen**, and J. Saha, "3D CNNs for Hyperspectral-Based Water Potability Detection," in *Soft Computing and Its Engineering Applications (icSoftComp 2025)*, Communications in Computer and Information Science, vol. 2873, pp. 208–221, Springer Nature Switzerland, 2026. doi:10.1007/978-3-032-22059-2_16
- [18] S. S. Parvez, R. Kumar, M. D. Shaheer, **S. Sen**, and P. Chakraborty, "Efficient LLM Framework Using LORA Based Fine Tuning to Analyze Textual Astronomical Data," in *Soft Computing and Its Engineering Applications (icSoftComp 2025)*, Communications in Computer and Information Science, vol. 2874, pp. 16–28, Springer Nature Switzerland, 2026. doi:10.1007/978-3-032-22062-2_2
- [19] R. Tufani, **S. Sen**, and P. Chakraborty, "Comprehensive Performance Analysis of PySpark and Pandas for Classification and Clustering Task," in *Advances in Health Informatics, Intelligent Systems, and Networking Technologies*, Lecture Notes in Networks and Systems, pp. 251–262, Springer Nature Singapore, 2025. doi:10.1007/978-981-96-4008-9_19

- [20] J. Saha, M. Kumar, A. Shah, and **S. Sen**, "Extensive Log Analysis Using Small Language Models in Minimal Resource Environments," *2025 IEEE International Conference on Automatic Control and Intelligent Systems (I2CACIS)*, pp. 500–505, IEEE, 2025. doi:10.1109/I2CACIS65476.2025.11100950
- [21] R. Tufani, **S. Sen**, and P. Chakraborty, "Harnessing The Potential of Pandas and PySpark: An In-Depth Performance Evaluation for Machine Learning Classification on Single Node Architectures," *2025 International Conference on Artificial Intelligence and Machine Vision (AIMV)*, pp. 1–6, IEEE, 2025. doi:10.1109/AIMV66517.2025.11203526
- [22] A. Hassan, A. Juturu, **S. Sen**, and R. Dsouza, "Real-Time Object Detection and Tracking Using Mobinet and SSD Algorithms," in *Intelligent Systems (International Conference on Machine Learning, IoT and Big Data)*, Lecture Notes in Networks and Systems, pp. 449–462, Springer Nature Singapore, 2025. doi:10.1007/978-981-96-3797-3_36
- [23] **S. Sen** and P. Chakraborty, "Evaluating Efficacy of MAML Based Approach on Regression Using Astronomical Imbalanced Dataset," *2024 International Conference on Computational Intelligence and Network Systems (CINS)*, pp. 1–8, IEEE, 2024. doi:10.1109/CINS63881.2024.10864404
- [24] M. Manasa and **S. Sen**, "Interpretable Predictions for crime categories using log loss approach for imbalanced target feature," *2024 IEEE International Conference on Contemporary Computing and Communications (InC4)*, pp. 1–6, IEEE, 2024. doi:10.1109/InC460750.2024.10649054
- [25] **S. Sen**, P. Chakraborty, S. Das, K. Pandey, and P. Narayana, "Investigation of Clustering Methods for SDSS Galaxy Images through Feature Extraction with VGG-16," *2024 IEEE Space, Aerospace and Defence Conference (SPACE)*, pp. 660–664, IEEE, 2024. doi:10.1109/SPACE63117.2024.10667753
- [26] **S. Sen**, S. Saha, P. Chakraborty, and K. P. Singh, "A Fast and Robust Photometric Redshift Forecasting Method Using Lipschitz Adaptive Learning Rate," in *Neural Information Processing (ICONIP 2022)*, Communications in Computer and Information Science, pp. 123–135, Springer Nature Singapore, 2023. doi:10.1007/978-981-99-1642-9_11
- [27] K. Shreevershith, **S. Sen**, and G. B. Roopesh, "An Energy-Efficient Deep Neural Network Model for Photometric Redshift Estimation," in *Innovations in Computer Science and Engineering*, Lecture Notes in Networks and Systems, pp. 319–330, Springer Nature Singapore, 2023. doi:10.1007/978-981-19-7455-7_24
- [28] **S. Sen**, S. Saha, P. Chakraborty, and K. P. Singh, "Implementation of Neural Network Regression Model for Faster Redshift Analysis on Cloud-Based Spark Platform," in *Advances and Trends in Artificial Intelligence. From Theory to Practice (IEA/AIE 2021)*, Lecture Notes in Computer Science, pp. 591–602, Springer International Publishing, 2021. doi:10.1007/978-3-030-79463-7_50
- [29] **S. Sen**, "Analysis, Visualization and prediction of Covid19 pandemic spread using Machine Learning," *LNCS, Springer*, 2020.
- [30] **S. Sen**, "Internet of Things: an Introduction to Connecting the Unconnected," in *International Journal of Engineering Research & Technology (IJERT)*, 2016.

Book Chapters

- [31] B. Madhu and **S. Sen**, "An AI-Based Secure and Robust Customized Patient Healthcare System Using Blockchain Technology," in *AI in Smart and Secure Healthcare*, Springer Optimization and Its Applications, pp. 449–468, Springer Nature Switzerland, 2026. doi:10.1007/978-3-032-15092-9_18
- [32] M. I. Hegde, N. Dhanvina, N. Dharshan, and **S. Sen**, "Investigation of Machine Learning Algorithms in Detecting Chronic Kidney Disorder," in *Machine Learning for Disease Detection, Prediction, and Diagnosis*, pp. 207–224, Springer Nature Singapore, 2025. doi:10.1007/978-981-96-4241-0_11
- [33] **S. Sen** and B. Madhu, "Revolutionizing Quantum Cryptography With Artificial Intelligence: A Perspective for Collaborative Research," in *Advancing Cyber Security Through Quantum Cryptography*, Advances in Information Security, Privacy, and Ethics, pp. 441–464, IGI Global, 2024. doi:10.4018/979-8-3693-5961-7.ch016
- [34] I. Amrita and **S. Sen**, "Deep Learning Algorithms for Classification and Prediction of Acute Lymphoblastic Leukemia," in *Current Applications of Deep Learning in Cancer Diagnostics*, pp. 115–124, CRC Press, 2023. doi:10.1201/9781003277002-9

Selected Articles in CSI Communications

- [35] **S. Sen**, "An Overview of Semantic Web," *CSI Communications*, 2020.
- [36] **S. Sen**, "Quantum Computing: A new phase of Computing," *CSI Communications*, 2020.
- [37] **S. Sen**, "Robotics as learning tutor and its aid in education," *CSI Communications*, 2020.

RESEARCH GRANTS

Project	Role	Agency	Period
Predicting the likelihood of PCOD from physical and psychological factors in young adult women using machine learning (₹3 lakh)	Co-PI	VGST, Govt. of Karnataka	2019–20
Constructing small language models as subject-matter experts using minimal resources (student project grant)	Mentor / Guide	KSCST	2023–24
Care-In-A-Cup: a solution to tend to the needs of differently abled women (student project grant)	Mentor / Guide	KSCST	2021–22

PATENTS

- A system and method for multimodal on-device emergency detection with indoor localization and alerts. *Published.*
- A system and method for optimizing emergency medical response through real-time data integration. *Applied.*

Proposals under review

- Investigation of the Baby Dragon Hatchling (BDH) architecture for satellite remote sensing image applications — ISRO RESPOND.
- A data-driven and sustainable AI/ML solution for enhancing rural education in Karnataka — VGST.
- Digital preservation of Indian ancient heritage using AI and immersive technologies: a metaverse approach.

RESEARCH SUPERVISION

- **Ph.D.:** guiding 4 doctoral scholars at MAHE (ongoing).
- **M.Tech.:** 10+ theses supervised.
- **B.E./B.Tech.:** 35+ projects supervised, including state-level exhibition and national ideathon winners.

INVITED TALKS

- Transformer-based models for astronomical data — guest talk, **IUCAA, Pune.**
- AI/ML training programme — **ISRO Telemetry, Tracking and Command Network (ISTRAC).**
- Skewed data distributions — guest lecture, **IIIT Allahabad.**

PROFESSIONAL SERVICE

- Session chair at international conferences in India and abroad.
- Lead editorial member for two forthcoming edited books.
- Organiser and resource person for conferences, workshops and faculty development programmes.
- Life member, Computer Society of India (CSI); organised CSI student-chapter events.

AWARDS AND RECOGNITION (WITH STUDENT TEAMS)

Winner, National-level Ideathon

Jun 2021

VVCE IEEE Computer Society Student Chapter

Web app using data analytics to preserve the street-vendor tradition of India post-COVID-19.

Winner, Paper Presentation

Dec 2020

34th CSI Karnataka State Student Convention, KSIT Bengaluru

“Working with Docker: The New Industry Need.”

Selected for State-level Exhibition

KSCST and VTU

“Care-In-A-Cup: A Solution to Tend to the Needs of Differently Abled Women.”