Deepayan Chakraborty

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Education

2019 – · · · **Ph.D., Department of AI, Indian Institute of Technology, Kharagpur**.
Thesis title: *Generative, Explainable, and Causal AI for Climate Prediction and Simulation.*

2016 – 2018 **M.Tech. Computer Science and Engg.(Spl. in Information Security), Indian Institute of Technology (Indian School of Mines), Dhanbad**.
Thesis title: *Segmentation of Connected Handwritten English Words.*

2010 – 2014 **B.Tech. Computer Science and Engg., Techno India College of Technology (currently, Techno International)**.

Employment History

Dec, 2018 – June, 2019 **Project Linked Person in ECSU, Indian Statistical Institute, Kolkata** for the project "Information Access from the Document Images of Indian Languages" under Prof. Bhabatosh Chanda.

Jul, 2018 – Sep, 2018 **Assistant Professor.** CSE Department, Institute of Engineering and Management, Kolkata.

2014 – 2016 **Software Engineer** Anti Money Laundering Project, L&T Infotech, Chennai.

Research Publications

1. D. Chakraborty, R. Kishore, R. Naskar, S. Jaiswal, and A. Mitra, "A comparative study of generative models as surrogates of earth system models to simulate global sea surface temperature," Jul. 2025. DOI: 10.22541/essoar.175396162.29110800/v1.
2. D. Chakraborty and A. Mitra, "Simulation of global sea surface temperature maps using pix2pix gan," *Environmental Data Science*, vol. 4, 2025, ISSN: 2634-4602. DOI: 10.1017/eds.2024.38.
3. D. Chakraborty, D. Sharma, A. Mitra, and B. N. Goswami, "Cv-gan - a generative model to simulate global climate variability," May 2025. DOI: 10.22541/essoar.174671893.31045476/v1.
4. D. Sharma, S. Das, D. Chakraborty, A. Mitra, and B. N. Goswami, "Improving indian summer monsoon rainfall prediction using deep learning up to two years in advance," 2025. DOI: https://doi.org/10.1002/qj.70023.
5. B. N. Goswami, D. Chakraborty, P. V. Rajesh, and A. Mitra, "Predictability of south-asian monsoon rainfall beyond the legacy of tropical ocean global atmosphere program (toga)," *npj Climate and Atmospheric Science*, vol. 5, no. 1, Jul. 2022, ISSN: 2397-3722. DOI: 10.1038/s41612-022-00281-3.
6. M. Wadhwani, D. Kundu, D. Chakraborty, and B. Chanda, "Text extraction and restoration of old handwritten documents," in *Digital Techniques for Heritage Presentation and Preservation*. Springer International Publishing, 2021, pp. 109–132, ISBN: 9783030579074. DOI: 10.1007/978-3-030-57907-4_6.

7 R. Mondal, D. Chakraborty, and B. Chanda, "Learning 2d morphological network for old document image binarization," in *2019 International Conference on Document Analysis and Recognition (ICDAR)*, IEEE, Sep. 2019, pp. 65–70. DOI: 10.1109/icdar.2019.00020.

8 D. Chakraborty, R. Pramanik, and S. Bag, "A novel approach towards segmentation of connected handwritten numerals," in *2017 Fourth International Conference on Image Information Processing (ICIIP)*, IEEE, Dec. 2017, pp. 1–5. DOI: 10.1109/iciip.2017.8313737.

Skills

Interests

- Understanding the recent climate scenario (mainly the recent catastrophic events)
- Apply the knowledge of AI to understand Natural Sciences
- Philosophy
- Politics
- Global Culture
- Mythology

Research Interests

- Application of AI and Statistics in
  - Climate Science
  - Other field of Science (Psychology, Physics, Chemistry)
  - Policy Making
- AI based Foundation Models
- Preparing light-weight surrogates for the AI-based Earth System Models.
- Working with a team of diverse expertise.
- Learning about the application for research projects.

Coding Languages: Python (PyTorch for Deep Learning), Matlab, JAVA, C.

Hobbies: Trekking, Swimming, Reading Novels, Playing Guitar, and Squash.

Miscellaneous Experience

Visit: Sustainability and Data Sciences Lab, North Eastern University, Boston, as part of the SPARC program by MHRD, Govt. of India.

Miscellaneous Experience (continued)

Annual Meet

- Chakraborty, Deepayan, and Adway Mitra. "Analyzing the Contribution and Interactions Between Global Drivers of Indian Summer Monsoon using Interpretable AI." AGU Fall Meeting Abstracts. Vol. 2024. 2024.
- Chakraborty, Deepayan, and Adway Mitra. "Analyzing the Contribution and Interactions Between Global Drivers of Indian Summer Monsoon using Interpretable AI." AGU Fall Meeting Abstracts. Vol. 2024. 2024.
- Chakraborty, Deepayan, et al. "Simulation of Monthly Global Sea Surface Temperature Data using Ensemble Pix2Pix Conditional GAN." AGU Fall Meeting Abstracts. Vol. 2024. 2024.
- Chakraborty, Deepayan, et al. "Identification of Global Drivers of Indian Summer Monsoon using Causal Inference and Interpretable AI." EGU General Assembly Conference Abstracts. 2022.

Workshops Attended

- ML for Earth System Science in ICTS, Bangalore, 2025.
- SPARC workshop by Prof. Auroop R. Ganguly in IIT Kharagpur, 2025.