

Debopriyo Banerjee

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Education

- 2015 - 2021 **Doctor of Philosophy, Computer Science & Engineering**
Indian Institute of Technology Kharagpur
Dissertation Title - Modeling Aesthetics in Fashion Recommendation using Machine Learning
Supervisor - Prof. Krothapalli Sreenivasa Rao (ksrao@cse.iitkgp.ac.in)
Joint Supervisor - Prof. Shamik Sural (shamik@cse.iitkgp.ac.in)
- 2012 - 2014 **Master of Engineering, Computer Science and Engineering**
Indian Institute of Engineering Science and Technology Shibpur
Dissertation Title - Design and Implementation of an Interface for Interoperability of Nodes in Heterogeneous Network Environment
Supervisor - Prof. Sipra Das Bit (sb@cs.iiests.ac.in)
Secured 84% aggregate
- 2008 - 2012 **Bachelor of Technology, Computer Science and Engineering**
West Bengal University of Technology
Secured 8.68/10 DGPA

Research Interests

- **Natural Language Processing:** Logical Reasoning with Large Language Models (LLMs), Quantification of Creativity and Novelty in AI-Generated Contents, Safety and Trustworthiness of LLMs.
- **Information Retrieval:** Embedding Models, BiEncoders and CrossEncoders.
- **Computer Vision:** Application of CNN, ViT, VAE, GAN, CLIP, Diffusion, and Multi-Modal Generative Models for *Outfit Compatibility and Style Prediction, Complete the Look, and Editing Items in Outfits*.
- **E-commerce Recommendation:** Content-based Generic Recommendation, Personalized Fashion Recommendation (including LLM + RAG-based solutions), Effective usage of Long Tail Items, and solutions for Cold Start Problem in Fashion.
- **Anomaly Detection:** Graph-based Collusion and Fraud Detection.

Technical Skills

- **Programming Languages:** Python, PHP, Javascript, SQL, NoSQL, and C.
- **Generative-AI:** Hands-on experience in Prompt-Engineering, Pre-training, Fine-tuning, RLHF, and Evaluation of LLMs.
- **Search Tools:** BM25, FAISS, and ChromaDB.
- **Other Tools and Frameworks:** Pytorch, PySpark, Spark SQL, Tensorflow, Flask, FastAPI, Gradio, VueJS, Google Cloud Platform, Git, and Github.

Work Experience

Apr 2022 - till now

Research Scientist II (promoted from Level I to II in 2023)

RIT, Rakuten India Enterprise Private Limited (Bengaluru, India)

Job Role:

- 1) Identify scope of research and development for business problems. Implement existing solutions, and propose a new solution by developing a proof of concept (after comparing with baselines) or working prototypes.
 - 2) Execute independent and collaborative research with academia, mentor interns.
 - 3) Present newly published research papers, relevant to company specific business problems to internal groups (weekly/monthly).
 - 4) Present research findings and achievements to internal groups (quarterly).
 - 5) Publish research findings (or file patents) at top-tier conferences, on a regular basis (one or more per year).
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Oct 2021 - Apr 2022

AI Engineer (remote)

R&D Center, AI Development, Valence Technologies Inc. (Tokyo, Japan)

Job Role:

- 1) Develop and maintain a Web Interface (using Flask + VueJs) for an online auction portal.
 - 2) Identify scope of research and development for business problems. Implement existing solutions, and propose a new solution by developing a proof of concept (after comparing with baselines) or working prototypes.
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Jan 2021 - Sep 2021

Research Associate + Summer Intern (remote)

Joint Collaboration: IIT Kharagpur & Flipkart Internet Private Limited

Job Role:

- 1) Design and conduct experiments for the Research Project - Complete the Look and Style Transfer in Fashion.
 - 2) Disseminate research outcomes to top-tier conference proceedings.
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Jul 2016 - Jun 2020

Teaching Assistant

Dept. of Computer Science and Engineering, IIT Kharagpur (Kharagpur, India)

Job Role:

- 1) Assist Professors in conducting Lab Courses: Computing Lab1 (PG-level), Programming and Data Structure (UG-level), and Database Management Systems (UG-level).
 - 2) Assist Professors in mentoring UG and PG students for their dissertations.
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Publications

- 2023 Debrup Das, **Debopriyo Banerjee**, Somak Aditya, Ashish Kulkarni. [MATHSENSEI: A Tool-Augmented Large Language Model for Mathematical Reasoning](#). Currently, under Review at NAACL, 2024.
- 2023 **Debopriyo Banerjee**, Mausam Jain, Ashish Kulkarni. [MFBE: Leveraging Multi-field Information of FAQs for Efficient Dense Retrieval](#). In Proceedings of the 27th Pacific-Asia Conference on Knowledge Discovery and Data Mining, pages 112-124, 2023.
- 2022 **Debopriyo Banerjee**, Harsh Maheshwari, Lucky Dhakad, Muthusamy Chelliah, Niloy Ganguly, Arnab Bhattacharya. [Recommendation of Compatible Outfits Conditioned on Style](#). Accepted at the 44th European Conference on Information Retrieval, 2022.
- 2022 **Debopriyo Banerjee**, Harsh Maheshwari, Lucky Dhakad, Arnab Bhattacharya, Niloy Ganguly, Muthusamy Chelliah, Suyash Agarwal. [An Application to Generate Style Guided Compatible Outfit](#). In Proceedings of the 9th ACM IKDD CODS and 27th COMAD 5th Joint International Conference on Data Science & Management of Data, 2022.
- 2021 Shubham Patil, **Debopriyo Banerjee**, and Shamik Sural. [A Graph Theoretic Approach for Multi-Objective Budget Constrained Capsule Wardrobe Recommendation](#). ACM Transactions on Information Systems, 40(1), 1:1–1:33, 2021.
- 2020 **Debopriyo Banerjee**, Krothapalli Sreenivasa Rao, Shamik Sural, and Niloy Ganguly. [BOXREC: Recommending a Box of Preferred Outfits in Online Shopping](#). ACM Transactions on Intelligent Systems and Technology, 11(6), 69:1–69:28, 2020.
- 2018 **Debopriyo Banerjee**, Niloy Ganguly, Shamik Sural, and Krothapalli Sreenivasa Rao. [One for the Road: Recommending Male Street Attire](#). In Proceedings of 22nd Pacific-Asia Conference on Knowledge Discovery and Data Mining, pages 571–582, 2018.
- 2018 Ewa Banaszak, **Debopriyo Banerjee**, Robert Florkowski, Tyll Krueger, Sudipta Saha, and Dimitri Volchenkov. [Coding and modelling of daily dress –about scientists coming out of the closet](#). Fabrica Societatis, (1/2018), pages 8–28, 2018.
- 2016 Ewa Banaszak, **Debopriyo Banerjee**, Tyll Krueger, Robert Florkowski, Tyll Krueger, Sudipta Saha, and Dimitri Volchenkov. [Men and the Clothing. Wroclaw Fashion Project](#). In Proceedings of the 10th International Fashion Conference, University of Navarra, pages 67–80, 2016.
- 2014 **Debopriyo Banerjee** and Sipra Das Bit. [Reviving Communication in Post Disaster Scenario Using ZIGBEE/GSM Heterogeneous Network](#). In Proceedings of the 2014 International Conference on Advances in Computing, Communications and Informatics, pages 2067-2073, 2014.
- 2012 **Debopriyo Banerjee**, Pratyasha Burman Ray, Sayan Mandal, and Subhabrata Debnath. [Shape Analysis of the Cells in Peripheral Blood Smear for Disease Diagnosis](#). In Proceedings of the All India Seminar on Computational Intelligence The Next Generation Challenges, pages 116-118, 2012.
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References

Dr. Ashish Kulkarni

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Dr. Somak Aditya

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Prof. K. S. Rao

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