Indradyumna Roy

Contact Information

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Research Interests

Designing neural models for representation learning and interaction modelling on graphs and sets. Focus on alignment-faithful models and LSH-compatible retrieval under general (incl. asymmetric) cost Optimal Transport based relevance functions.

Education

Indian Institute of Technology, Bombay, India.
PhD in Computer Science and Engineering. Jul'21– Present.
Topic: Scalable Neural Graph Retrieval. [Research Statement]
Advisors: Abir De, Soumen Chakrabarti.
Fellowships: PMRF (2022-2024), Qualcomm Innovation Fellowship (2022-24), Google PhD Fellowship (2024), MSR India PhD Award (2025).
CGPA: 10/10.

Indian Institute of Technology, Bombay, India.
Master of Technology in Computer Science and Engineering. Jul'15– Jun'17.
CGPA: 9.12/10.

Jadavpur University, Kolkata, India.
Bachelor of Engineering in Computer Science and Engineering. Jul'09– Jun'13.
CGPA: 8.19/10.

Awards

[1] **Microsoft Research India PhD Award (2025)**

[2] Google Ph.D Fellowship (2024)

[3] Qualcomm Innovation Fellowship (Winner, 2022. Super-Winner, 2023.)

[4] Prime Minister's Research Fellowship

[5] Google Student Travel Grant (USD 3,000 for attending NeurIPS 2023)

Publications

Google Scholar Profile
DBLP Profile

[1] Pritish Chakraborty, **Indradyumna Roy**, Soumen Chakrabarti, Abir De. *Contextual Tokenization for Graph Inverted Indices* . In Neural Information Processing Systems (NeurIPS), 2025.

[2] **Indradyumna Roy**, Saswat Meher, Eeshaan Jain, Soumen Chakrabarti, Abir De. *Position: Graph Matching Systems Deserve Better Benchmarks*. In International Conference on Machine Learning (ICML), 2025.

[3] **Indradyumna Roy***, Eeshaan Jain*, Soumen Chakrabarti, Abir De. *Clique Number Estimation via Differentiable Functions of Adjacency Matrix Permutations*. In International Conference on Learning Representations (ICLR), 2025.

[4] Vaibhav Raj*, **Indradyumna Roy***, Ashwin Ramachandran, Soumen Chakrabarti, Abir De. *Charting the Design Space of Neural Graph Representations for Subgraph Matching* . In International Conference on Learning Representations (ICLR), 2025.

[5] Eeshaan Jain*, **Indradyumna Roy***, Saswat Meher, Soumen Chakrabarti, Abir De. *Graph Edit Distance with General Costs Using Neural Set Divergence*. In Neural Information Processing Systems (NeurIPS), 2024.

[6] Ashwin Ramachandran, Vaibhav Raj, **Indradyumna Roy**, Soumen Chakrabarti, Abir De. *Iteratively Refined Early Interaction Alignment for Subgraph Matching based Graph Retrieval* . In Neural Information Processing Systems (NeurIPS), 2024.

[7] **Indradyumna Roy**, Rishi Agarwal, Soumen Chakrabarti, Anirban Dasgupta, Abir De. *Locality Sensitive Hashing in Fourier Frequency Domain For Soft Set Containment Search*. In Neural Information Processing Systems (NeurIPS), 2023. (**Spotlight**)

[8] **Indradyumna Roy**, Soumen Chakrabarti and Abir De. *Maximum Common Subgraph Guided Graph Retrieval: Late and Early Interaction Networks*. In Neural Information Processing Systems (NeurIPS), 2022.

[9] **Indradyumna Roy**, Venkata Sai Velugoti, Soumen Chakrabarti and Abir De. *Interpretable Neural Subgraph Matching for Graph Retrieval*. In AAAI Conference on Artificial Intelligence (AAAI), 2022.

[10] **Indradyumna Roy**, Abir De, Soumen Chakrabarti. *Adversarial Permutation Guided Node Representations for Link Prediction*. In AAAI Conference on Artificial Intelligence (AAAI), 2021.

[11] Soham De, **Indradyumna Roy**, Tarunima Prabhakar, Kriti Suneja, Sourish Chaudhuri, Rita Singh, Bhiksha Raj,. *Plagiarism Detection in Polyphonic Music using Monaural Signal Separation*. In InterSpeech (ICSA), 2012.

Reviewing

AISTATS (Reviewer, 2025). ICLR (Reviewer, 2025, 2026). LoG (Reviewer, 2025). NeurIPS (Reviewer, 2024, 2025). AAAI (Reviewer, 2022, 2023, 2024).

Current & Previous appointments

QuML@Aalto University Host: Vikas Garg
Visiting Research Assistant. Jun'25– Aug'25
Google DeepMind. Host: Vinod Nair
Student Researcher. Jun'23– Nov'23
Indian Institute of Technology, Bombay, India.
Project Research Assistant. Jan'20– Jun'21
Samsung R&D Institute India-Bangalore, Karnataka India.
Software Engineer. Jul'17– Aug'19
Synopsys India Pvt. Ltd., Bangalore, Karnataka India.
R&D Engineer. Aug'13– Jul'15

Other Activities

[1] Presenting a tutorial on Retrieval of Graph Structured Objects: Theory and Applications at CIKM 2025.

[2] Invited talk on Neural Graph Retrieval at IBM Research Zurich [PPT]

[3] Guest Lecture on Graph Neural Networks for CS728, IIT Bombay [PPT]

[4] Attended Machine Learning Summer School (MLSS24) at OIST, Okinawa.

[5] Attended ML for Drug Discovery Summer School (ML4DD) at Montreal.

[6] Winner of the Kinase Selectivity Challenge Hackathon [LINK], organized by Valence Labs at ML for Drug Discovery Summer School

TECHNICAL SKILLS	Programming Languages: C, C++, Python Tools and Libraries : LaTeX, TensorFlow, PyTorch, PyTorch Geometric

TEACHING

Teaching Assistant for following courses :

[1] **CS101: Computer Programming and Utilization** (July'15– Dec'15)

[2] **CS302+CS306: Implementation of Programming Languages** (Jan'16– May'16)

[3] **CS601: Algorithms & Complexity** (July'16– Dec'16)

[4] **CS152-CS156: Abstractions & Paradigms for Programming** (Jan'17– May'17)

[5] **CS768: Learning with Graphs** (July'21– Dec'21, July'23– Dec'23)

[6] **CS419M: Introduction to Machine Learning** (Jan'22– May'22, Jan'23– May'23)

[7] **CS335+CS337: Artificial Intelligence and Machine Learning** (Jul'22– Dec'22)