Indradyumna Roy

Contact Information

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Research Interests

Designing neural models for representation learning and interaction modelling on graphs and sets. Complex multi-modal information retrieval and question answering.

Education

Indian Institute of Technology, Bombay, India.
PhD in Computer Science and Engineering. Jul'21– Present.
Topic: Representation Learning for Scalable and Multi-modal Graph Retrieval.
Advisors: Abir De, Soumen Chakrabarti.
Recipient of Prime Minister's Research Fellowship (2022).
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.

Previous appointments

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

Publications

Google Scholar Profile
DBLP Profile

[1] **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.

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

[3] 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.

Under Submission

Indradyumna Roy, Soumen Chakrabarti and Abir De.
Maximum Common Subgraph Guided Graph Retrieval: Late and Early Interaction Networks.

Reviewing

AAAI (Reviewer, 2021). ICLR (Sub-Reviewer, 2021). TACL (Sub-Reviewer, 2022)

MTech Thesis

Topic : Causal Inference on Observational Data (June'16– June'17)
Advisor: J Saketha Nath.
Given a joint distribution, how to infer directionality of causal influence among the involved random variables. How to exploit prior information about causal structure to improve performance of machine learning algorithms.

MTech Seminar

Topic : Diverse Multiple Kernel Learning (Jan'16– May'16)
Advisor: J Saketha Nath.
Worked on a novel framework for enabling diversification of Kernels selected as part of Multiple Kernel Learning process.

Selected Projects

[1] **TextJoin** (Sept'16– May'17)
Guide: Soumen Chakrabarti.
Improved question answering over text, preferably without using a knowledge base. Extraction, Scoring and Ranking of candidate entities based on evidence snippets extracted from multiple documents, supporting type and relationship specified in query. Compiled a list of ~150 queries where current search engines perform poorly and built a preliminary system to provide ranked answer entities for those queries.

[2] **Implementation of Row Level Security in PostGreSQL** (Sept'15– Nov'15)
Guide: S. Sudarshan.
Made changes in Postgresql source to implement row level security on relations. Added support for predicated grants implemented by query rewriting using views.

[3] **Extractive Summarization of Hindi Documents** (July'16– Nov'16)
Guide: Pushpak Bhattacharyya.
Explored if translation to English space and incorporating word/sentence embeddings can help improve summarization techniques. Implemented TextRank algorithm for extracting most relevant sentences for summary. Incorporated Hindi and English text embeddings for similarity scoring and ranking.

Technical Skills

Programming Languages: C, C++, Python, Matlab
Tools and Libraries : LaTeX, TensorFlow, PyTorch

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)

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