

Jishnu Ray Chowdhury

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SUMMARY: Ph.D. candidate at the University of Illinois at Chicago. Experienced broadly in machine learning R&D specializing in Natural Language Processing.

EDUCATION

Doctor of Philosophy (Ph.D.) - Computer Science 2019-2024
University of Illinois at Chicago (CGPA: 4.0/4.0)
(Transferred from Kansas State University)

Doctor of Philosophy (Ph.D.) - Computer Science 2018-2019
Kansas State University (CGPA: 4.0/4.0)

Bachelor of Technology (B. Tech.) - Computer Science 2014-2017
Calcutta Institute of Engineering and Management (DGPA: 8.06/10)

WORK EXPERIENCE

Research Assistant

University of Illinois at Chicago

Chicago, IL | June. 2019 - May. 2020, Aug. 2020 - May. 2021, Aug. 2021-Now

1. Worked on multiple keyphrase generation projects. Developed the idea of keyphrase dropout to enhance absent keyphrase generation - leading to publication.
2. Independently initiated and worked through several research directions. For example - developing novel recursive neural network architectures and exploring better positional encoding for length generalization. It led to multiple publications at NeurIPS/ICML.
3. Collaborated on different projects with other students and advised other master/PhD students on research.
4. Explored multiple other directions - enhancing Transformers with recurrence and MoE, Contrastive learning, Curriculum learning, Grounded Language Learning, Imitation Learning, Multilingual Text Classification, and Compositional Generalization among others.
5. Developed broad experience in various areas of Natural Language Processing and some Computer Vision.

Kansas State University

Manhattan, KS | Aug. 2018 - May. 2019

1. Worked on Named Entity Recognition and Keyphrase Extraction from social media texts.
2. Developed new evaluations and datasets for Keyphrase Extraction from Tweets. Also, led to two publications.

Data Science Research Intern

Bloomberg

New York, NY | May. 2020 - Aug. 2020

1. Worked on generating salient questions automatically from a document using a pre-trained Language Model (T5).
2. Performed multiple experiments involving multiple approaches involving multi-tasking in a cloud platform.
3. Developed a new evaluation for comparing sets of questions. Exposed systematic issues in prior evaluations.
4. Built a Fast API interface for demonstration.

May 2021. - Aug. 2021

1. Proposed prompt tuning-based approach for paraphrase generation using language models (GPT2).
2. Proposed a method to control and enhance the novelty of paraphrase generation.
3. Integrated the approach with retrieval augmented few-shot examples for better generation quality.
4. Led the work to publication at AAAI 2022.

PUBLICATIONS

1. Modeling Hierarchical Structures with Continuous Recursive Neural Networks - Jishnu Ray Chowdhury, Cornelia Caragea. ICML 2021 **(Long Talk)**
2. Novelty Controlled Paraphrase Generation with Retrieval Augmented Conditional Prompt Tuning - Jishnu Ray Chowdhury, Yong Zhuang, Shuyi Wang. AAAI 2022 **(Oral)**
3. Beam Tree Recursive Cells - Jishnu Ray Chowdhury, Cornelia Caragea. ICML 2023
4. Efficient Beam Tree Recursion - Jishnu Ray Chowdhury, Cornelia Caragea. NeurIPS 2023
5. Recursion in Recursion - Jishnu Ray Chowdhury, Cornelia Caragea. NeurIPS 2023
6. Monotonic Location Attention for Length Generalization - Jishnu Ray Chowdhury, Cornelia Caragea. ICML 2023
7. KPDRP: Improving Absent Keyphrase Generation - Jishnu Ray Chowdhury, Seoyeon Park, Tuhin Kundu, Cornelia Caragea. EMNLP Findings 2022
8. Data Augmentation for Low-Resource Keyphrase Generation - Krishna Garg, Jishnu Ray Chowdhury, and Cornelia Caragea. ACL Findings 2023
9. Keyphrase Generation Beyond the Boundaries of Title and Abstract - Krishna Garg Jishnu Ray Chowdhury, Cornelia Caragea. ACL Findings 2022
10. Neural Keyphrase Generation: Analysis and Evaluation - Tuhin Kundu, Jishnu Ray Chowdhury, Cornelia Caragea. ArXiv 2023
11. On the Evaluation of Answer-Agnostic Paragraph-level Multi-Question Generation - Jishnu Ray Chowdhury, Debanjan Mahata, Cornelia Caragea. ArXiv 2022
12. Cross-Lingual Disaster-related Multi-label Tweet Classification with Manifold Mixup - Jishnu Ray Chowdhury, Cornelia Caragea, Doina Caragea. ACL SRW 2020
13. Keyphrase Extraction from Disaster-related Tweets - Jishnu Ray Chowdhury, Cornelia Caragea, Doina Caragea. WWW 2019
14. On Identifying Hashtags in Disaster Twitter Data - Jishnu Ray Chowdhury, Cornelia Caragea, Doina Caragea. AAAI 2020

PROJECTS

See more at: <https://jrc1995.github.io/>

Zero-Shot Factored Prompting on LLMs

[View on Github](#)

- Explored different zero-shot prompting techniques to probe Large Language Models (LLMs) to automatically decompose reasoning steps.
- Developed codes for searching over reasoning space (using Monte Carlo Tree Search/Beam Search etc.) guided by self-evaluation. Explored different majority voting strategies for collating results from multiple reasoning samples.

Conversational Bot

[View on Github](#)

- Developed a chatbot based on a hybrid neural retrieval (from vector database) and GPT-based generation mechanism.
- The model is integrated with a Text-to-Speech (TTS) Mechanism.

Deep Learning Optimizer Library

[View on Github](#)

- Created a library to allow synergy between different deep-learning optimizers.
- It also allows hypergradient optimization of optimizer hyperparameters.

Named Entity Recognition (NER) on Social Media

[View on Github](#)

- Developed various NER frameworks, including noise-reduction strategies.

SKILLS

Python | Pytorch | Huggingface | vLLM | Tensorflow | AWS | Cloud | Java | JavaScript | C | C++ | NodeJS | Vue | SQL | NoSQL

SERVICES: ICML 2024 Reviewer, NAACL 2024 Reviewer, ICLR 2024 Reviewer, AAAI 2024 Reviewer, EMNLP 2023 Reviewer, NeurIPS 2023 Reviewer, ACL 2023 Reviewer, ICLR 2023 Reviewer, AAAI 2023 Reviewer, ACL 2021 Reviewer, Multiple ARR Reviews