

# Jishnu Ray Chowdhury

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**SUMMARY:** Ph.D. candidate at the University of Illinois at Chicago. Experienced in machine learning R&D specializing in NLP.

## EXPERIENCE

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### Research Assistant

#### University of Illinois at Chicago

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

- Worked on keyphrase generation projects leading to multiple publications.
- Independently initiated and worked through several research directions. For example - developing novel recursive neural network architectures and exploring better positional encoding. Led to multiple publications at NeurIPS/ICML.
- Explored multiple other directions - enhancing Transformers with recurrence and MoE, Contrastive learning, Curriculum learning, Grounded Language Learning, Multilingual Text Classification, and Compositional Generalization among others.

#### Kansas State University

Manhattan, KS | Aug. 2018 - May. 2019

- Worked on Named Entity Recognition and Keyphrase Extraction from social media texts.
- Developed new evaluations and datasets for Keyphrase Extraction from Tweets. Led to two publications.

### Data Science Research Intern

#### Bloomberg

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

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

May. 2021 - Aug. 2021

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

### Freelance Full-Stack Development

#### RBIC Solutions

Sep. 2016 - May. 2017

- Full-stack freelance project for RBIC solutions. Worked on a full-stack software connected to a database that allows restaurants to manage menus, recipes, ingredients, and food costs, among other information.
- Engaged in full-stack development, including design of database, queries, frontend UI, and some backend programming

## PUBLICATIONS

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

1. Recurrent Transformers with Dynamic Halt - Jishnu Ray Chowdhury, and Cornelia Caragea. ArXiv 2024
2. Recursion in Recursion - Jishnu Ray Chowdhury, and Cornelia Caragea. NeurIPS 2023
3. Efficient Beam Tree Recursion - Jishnu Ray Chowdhury, and Cornelia Caragea. NeurIPS 2023
4. Monotonic Location Attention for Length Generalization - Jishnu Ray Chowdhury, and Cornelia Caragea. ICML 2023
5. Beam Tree Recursive Cells - Jishnu Ray Chowdhury, and Cornelia Caragea. ICML 2023
6. Neural Keyphrase Generation: Analysis and Evaluation - Tuhin Kundu, Jishnu Ray Chowdhury, Cornelia Caragea. ArXiv 2023
7. Data Augmentation for Low-Resource Keyphrase Generation - Krishna Garg Jishnu Ray Chowdhury, Cornelia Caragea. ACL Findings 2023
8. KPDRP: Improving Absent Keyphrase Generation - Jishnu Ray Chowdhury, Seoyeon Park, Tuhin Kundu, and Cornelia Caragea. EMNLP Findings 2022
9. Keyphrase Generation Beyond the Boundaries of Title and Abstract - Krishna Garg, Jishnu Ray Chowdhury, Cornelia Caragea.

EMNLP Findings 2022

10. Novelty Controlled Paraphrase Generation with Retrieval Augmented Conditional Prompt Tuning - Jishnu Ray Chowdhury, Yong Zhuang, Shuyi Wang. AAAI 2022 **(Oral)**
11. On the Evaluation of Answer-Agnostic Paragraph-level Multi-Question Generation - Jishnu Ray Chowdhury, Cornelia Caragea, Debanjan Mahata. ArXiv 2022
12. Modeling Hierarchical Structures with Continuous Recursive Neural Networks - Jishnu Ray Chowdhury, and Cornelia Caragea. ICML 2021 **(Long Talk)**
13. Cross-Lingual Disaster-related Multi-label Tweet Classification with Manifold Mixup- Jishnu Ray Chowdhury, Cornelia Caragea, Doina Caragea. ACL SRW, 2020
14. On Identifying Hashtags in Disaster Twitter Data - Jishnu Ray Chowdhury, Cornelia Caragea, Doina Caragea. AAAI 2020
15. Keyphrase Extraction from Disaster-related Tweets - Jishnu Ray Chowdhury, Cornelia Caragea, Doina Caragea. WWW 2019

## PROJECTS

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

### Zero-Shot Factored Prompting on LLMs (2023)

[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 (2020)

[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 (2021)

[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 (2021)

[View on Github](#)

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

### E-Dialectics (2019)

[View on Github](#)

- Reddit-like toy social media website connected to both MySQL and NoSQL (MongoDB) databases. Utilizes Vue and NodeJS.
- Core functionalities are similar to Reddit, except that the subforums ('subreddits') are fixed and not determined by users.

## EDUCATION

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### 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)

## SKILLS

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

## SERVICES

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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