

# Swarnadeep Saha

CS PhD Candidate and Google PhD Fellow, UNC Chapel Hill, NC, USA

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## RESEARCH INTERESTS

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Natural Language Processing, Deep Learning, Large Language Models, Reasoning.

## EDUCATION

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### UNC Chapel Hill

*Ph.D. in Computer Science, Advisor: [Prof. Mohit Bansal](#)*

*[Google PhD Fellowship in NLP for 2023 and 2024](#)*

*Munroe and Rebecca Cobey Fellowship*

North Carolina, USA

2019 - 2024 (Expected)

### Indian Institute of Technology, Delhi

*M.Tech. in Computer Science, Advisor: [Prof. Mausam](#), GPA: 9.01/10.0*

*Thesis: Open Information Extraction from Numerical and Conjunctive Sentences*

*Best M.Tech Thesis Award in Computer Science*

Delhi, India

2015 - 2017

### Jadavpur University

*B.E. in Computer Science, GPA: 8.72/10.0*

Kolkata, India

2010 - 2014

## PUBLICATIONS

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- Branch-Solve-Merge Improves Large Language Model Evaluation and Generation**  
Swarnadeep Saha, Omer Levy, Asli Celikyilmaz, Mohit Bansal, Jason Weston, and Xian Li  
Under Review at NAACL 2024 [Long][pdf]
- ReConcile: Round-Table Conference Improves Reasoning via Consensus among Diverse LLMs**  
Justin Chih-Yao Chen, Swarnadeep Saha, and Mohit Bansal  
Under Review at ICLR 2024 [Long][pdf]
- Can Language Models Teach Weaker Agents? Teacher Explanations Improve Students via Personalization**  
Swarnadeep Saha, Peter Hase, and Mohit Bansal  
NeurIPS 2023 [Long][Poster][Acceptance Rate: 26%][pdf]
- ReCEval: Evaluating Reasoning Chains via Correctness and Informativeness**  
Archiki Prasad, Swarnadeep Saha, Xiang Zhou, and Mohit Bansal  
EMNLP 2023 [Long][Poster][Acceptance Rate: 23%][pdf]
- MURMUR: Modular Multi-Step Reasoning for Semi-Structured Data-to-Text Generation**  
Swarnadeep Saha, Xinyan Velocity Yu, Mohit Bansal, Ramakanth Pasunuru, and Asli Celikyilmaz  
ACL Findings 2023 [Long][Acceptance Rate: %][pdf]
- Summarization Programs: Interpretable Abstractive Summarization with Neural Modular Trees**  
Swarnadeep Saha, Shiyue Zhang, Peter Hase, and Mohit Bansal  
ICLR 2023 [Long][Poster][Acceptance Rate: 32%][pdf]

7. **Are Hard Examples also Harder to Explain? A Study with Human and Model-Generated Explanations**  
Swarnadeep Saha, Peter Hase, Nazneen Rajani, and Mohit Bansal  
EMNLP 2022 [Short][Oral][Acceptance Rate (short): 12%][\[pdf\]](#)
8. **Explanation Graph Generation via Pre-trained Language Models: An Empirical Study with Contrastive Learning**  
Swarnadeep Saha, Prateek Yadav, and Mohit Bansal  
ACL 2022 [Long][Poster][Acceptance Rate: 21%][\[pdf\]](#)
9. **ExplaGraphs: An Explanation Graph Generation Task for Structured Commonsense Reasoning**  
Swarnadeep Saha, Prateek Yadav, Lisa Bauer, and Mohit Bansal  
EMNLP 2021 [Long][Oral][Acceptance Rate: 23%][\[pdf\]](#)
10. **multiPProver: Generating a Set of Proofs for Improved Interpretability in Rule Reasoning**  
Swarnadeep Saha, Prateek Yadav, and Mohit Bansal  
NAACL 2021 [Long][Oral][Acceptance Rate: 26%][\[pdf\]](#)
11. **PProver: Proof Generation for Interpretable Reasoning over Rules**  
Swarnadeep Saha, Sayan Ghosh, Shashank Srivastava, and Mohit Bansal  
EMNLP 2020 [Long][Oral][Acceptance Rate: 24%][\[pdf\]](#)
12. **ConjNLI: Natural Language Inference over Conjunctive Sentences**  
Swarnadeep Saha, Yixin Nie, and Mohit Bansal  
EMNLP 2020 [Long][Poster][Acceptance Rate: 24%][\[pdf\]](#)
13. **Pre-Training BERT on Domain Resources for Short Answer Grading**  
Chul Sung, Tejas Dhamecha, Swarnadeep Saha, Tengfei Ma, Vinay Reddy, and Rishi Arora  
EMNLP 2019 [Short][Poster][Acceptance Rate: 23%][\[pdf\]](#)
14. **Aligning Learning Objectives to Learning Resources: A Lexico-Semantic Spatial Approach**  
Swarnadeep Saha, Malolan Chetlur, Tejas I. Dhamecha, Shantanu Godbole and others  
IJCAI 2019 [Long][Oral+Poster][Acceptance Rate: 17%][\[pdf\]](#)
15. **Creating Scoring Rubric from Representative Student Answers for Improved Short Answer Grading**  
Smit Marvaniya, Swarnadeep Saha, Tejas I. Dhamecha, Peter Foltz, Renuka Sindhgatta and Bikram Sengupta  
CIKM 2018 [Long][Oral][Acceptance Rate: 17%][\[pdf\]](#)
16. **Joint Multi-Domain Learning for Automatic Short Answer Grading**  
Swarnadeep Saha, Tejas I. Dhamecha, Smit Marvaniya, Peter Foltz, Renuka Sindhgatta and Bikram Sengupta  
arXiv 1902.09183 [Long][\[pdf\]](#)
17. **Open Information Extraction from Conjunctive Sentences**  
Swarnadeep Saha and Mausam  
COLING 2018 [Long][Oral][Acceptance Rate: 37%][\[pdf\]](#)
18. **Balancing Human Efforts and Performance of Student Response Analyzer in Dialog-based Tutors**  
Tejas I. Dhamecha, Smit Marvaniya, Swarnadeep Saha, Renuka Sindhgatta and Bikram Sengupta  
AIED 2018 [Long][Oral][Acceptance Rate: 25%][\[pdf\]](#)

19. **Sentence Level or Token Level Features for Automatic Short Answer Grading?: Use Both Swarnadeep Saha**, Tejas I. Dhamecha, Smit Marvaniya, Renuka Sindhgatta and Bikram Sengupta  
**AIED 2018** [Long][Oral][Acceptance Rate: 25%][\[pdf\]](#)
20. **Bootstrapping for Numerical Open IE**  
**Swarnadeep Saha**, Harinder Pal and Mausam  
**ACL 2017** [Short][Poster][Acceptance Rate: 18%][\[pdf\]](#)

## INDUSTRY EXPERIENCE

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### FAIR Labs, AI at Meta

*Research Intern, Mentors: [Dr. Xian Li](#) and [Dr. Jason Weston](#)*

- o Large Language Model Evaluation.
- o Paper in submission to **NAACL 2024**.

**Palo Alto, USA**

*May 2023-Dec 2023*

### FAIR Labs, AI at Meta

*Research Intern, Mentor: [Dr. Asli Celikyilmaz](#)*

- o Multi-step Reasoning for Text generation from semi-structured data.
- o Paper accepted to **Findings of ACL 2023**.

**Seattle, USA**

*May 2022-Dec 2022*

### Salesforce AI Research

*Research Intern, Mentors: [Dr. Nazneen Rajani](#) and [Dr. Jesse Vig](#)*

- o Analyzing **Explanation hardness** by connecting **Interpretability** to **Sample hardness**.
- o Paper accepted as oral to **EMNLP 2022**.

**Palo Alto, USA**

*June 2021-August 2021*

### IBM Research

*Research Engineer, Manager: [Dr. Shantanu Godbole](#)*

- o Designed and implemented large scale **Machine Learning** and **NLP** solutions for **Intelligent Tutoring Systems (Watson Tutor)**, notably in the areas of **Automatic Short Answer Grading** and **Text Segmentation**.
- o *Lab-wide Research Appreciation* award and twice *Manager's Choice* award.

**Bangalore, India**

*July 2017 - June 2019*

### Adobe Systems

*Member of Technical Staff, Manager: [Rajeev Sharma](#)*

- o Worked as a full-stack software developer in the **Acrobat Reader Team** of Adobe.

**Noida, India**

*June 2014 - July 2015*

## ACHIEVEMENTS AND AWARDS

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- o **Google PhD Fellowship** (one of eight students worldwide) in NLP with full funding for 2 years.
- o **Munroe and Rebecca Cobey Fellowship** at UNC Chapel Hill.
- o **Best M.Tech. Thesis** in Computer Science at IIT Delhi.
- o Lab-wide **Research Appreciation Award** at IBM Research.
- o Twice **Manager's Choice Award** at IBM Research.
- o **All India Rank of 142** in Graduate Aptitude Test in Engineering (GATE), 2014 among 155190 applicants.
- o **State Rank of 96** in West Bengal Joint Entrance Examination (WBJEE), 2010 among 127196 applicants.

## PROFESSIONAL SERVICE

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- o Conference Reviewer: NAACL 2024, ACL 2023, EMNLP 2023, NeurIPS 2023, ARR 2022, EMNLP 2022, ARR 2021, EMNLP 2021, NAACL 2021, AAAI 2020, AIED 2019, NAACL 2019, EMNLP

2018.

- Journal Reviewer: AI Journal (AIJ), Computational Linguistics (CL).

## SOFTWARE SKILLS

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- Programming Languages: C, C++, Java, Scala, Python, Perl, Assembly Languages.
- Databases: MySQL, PostgreSQL.
- Frameworks and Tools: PyTorch, Keras, Hadoop, Git, Perforce, Maven, SBT.

## RELEVANT GRADUATE LEVEL COURSES

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- Machine Learning, Advanced Machine Learning, Graphical Models, Generative Models, Advanced NLP, Grounding in NLP, Structured Prediction, Machine Learning and Graphics.

## REFERENCES

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- [Dr. Mohit Bansal](#), John R. & Louise S. Parker Associate Professor of CS, UNC Chapel Hill.
- [Dr. Mausam](#), Professor, Jai Gupta Chair of CSE and Founding Head of School of AI, IIT Delhi and Affiliate Professor of CS, University of Washington, Seattle.
- [Dr. Jason Weston](#), Research Scientist, Fundamental AI Research (FAIR), Meta.
- [Dr. Asli Celikyilmaz](#), Senior Research Manager, Fundamental AI Research (FAIR), Meta.
- [Dr. Shashank Srivastava](#), Assistant Professor of CS, UNC Chapel Hill.
- [Dr. Nazneen Rajani](#), Robustness Research Lead, Hugging Face.