

# Swarnadeep Saha

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

🌐 <https://swarnahub.github.io>

🔗 <https://github.com/swarnaHub>

✉ swarna@cs.unc.edu 📞 919-641-7845

## RESEARCH INTERESTS

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Natural Language Processing, Deep Learning, Interpretable AI, Reasoning.

## EDUCATION

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**UNC Chapel Hill**

**North Carolina, USA**

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

*2019 - Present*

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

*[Munroe and Rebecca Cobey Fellowship](#)*

**Indian Institute of Technology, Delhi**

**Delhi, India**

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

*2015 - 2017*

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

*Best M.Tech Thesis Award in Computer Science*

**Jadavpur University**

**Kolkata, India**

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

*2010 - 2014*

## PUBLICATIONS

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- Can Language Models Teach Weaker Agents? Teacher Explanations Improve Students via Theory of Mind**  
Swarnadeep Saha, Peter Hase, and Mohit Bansal  
Under Review at **NeurIPS 2023** [Long][[pdf](#)]
- ReCEval: Evaluating Reasoning Chains via Correctness and Informativeness**  
Archiki Prasad, Swarnadeep Saha, Xiang Zhou, and Mohit Bansal  
Under Review at **EMNLP 2023** [Long][[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][Oral][[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](#)]
- 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: 12%][[pdf](#)]

6. **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%][\[pdf\]](#)
7. **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%][\[pdf\]](#)
8. **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%][\[pdf\]](#)
9. **PProver: Proof Generation for Interpretable Reasoning over Rules**  
Swarnadeep Saha, Sayan Ghosh, Shashank Srivastava, and Mohit Bansal  
EMNLP 2020 [Long][Oral][Acceptance Rate: 24%][\[pdf\]](#)
10. **ConjNLI: Natural Language Inference over Conjunctive Sentences**  
Swarnadeep Saha, Yixin Nie, and Mohit Bansal  
EMNLP 2020 [Long][Poster][Acceptance Rate: 24%][\[pdf\]](#)
11. **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%][\[pdf\]](#)
12. **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%][\[pdf\]](#)
13. **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%][\[pdf\]](#)
14. **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][\[pdf\]](#)
15. **Open Information Extraction from Conjunctive Sentences**  
Swarnadeep Saha and Mausam  
COLING 2018 [Long][Oral][Acceptance Rate: 37%][\[pdf\]](#)
16. **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%][\[pdf\]](#)
17. **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%][\[pdf\]](#)

## 18. 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, Meta AI Research

Palo Alto, USA

Research Intern, Mentors: [Dr. Xian Li](#) and [Dr. Omer Levy](#)

May 2023-Present

- Topics in Reasoning.

### FAIR Labs, Meta AI Research

Seattle, USA

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

May 2022-Dec 2022

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

### Salesforce AI Research

Palo Alto, USA

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

June 2021-August 2021

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

### IBM Research

Bangalore, India

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

July 2017 - June 2019

- 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.
- Lab-wide Research Appreciation award and twice Manager's Choice award.

### Adobe Systems

Noida, India

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

June 2014 - July 2015

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

## ACHIEVEMENTS AND AWARDS

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

## PROFESSIONAL SERVICE

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- Conference Reviewer: 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. 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.