

Soumya Sanyal

CONTACT INFORMATION	RTH 315, University of Southern California Los Angeles, CA 90007	Email: sanyal.soumya8@gmail.com Website: soumyasanyal.github.io
RESEARCH INTERESTS	I am broadly interested in Natural Language Processing and Deep Learning on Graphs. My recent research has focused on robustness of NLP models on reasoning tasks and explanation-based learning.	
EDUCATION	University of Southern California , Los Angeles, CA Ph.D. in Computer Science (GPA 3.94/4.0) Advisor: Dr. Xiang Ren	2020 – Present
	Indian Institute of Technology , Kharagpur, India B.Tech in Electronics and Electrical Communication (GPA 8.98/10.0) Minor in Computer Science	2012 – 2016
WORK EXPERIENCE	Amazon , Santa Clara, USA <i>Research Intern, AWS Deep-Engine Science team</i> Mentored by Dr. Vassilis N. Ioannidis and Dr. Huzefa Rangawala in the AWS GraphRAG team. Worked on developing a hallucination detection system for LLMs using textual graphs.	May 2024 – Aug 2024
	Amazon , Santa Clara, USA <i>Research Intern, AWS Deep-Engine Science team</i> Mentored by Dr. Aditya Rawal and Dr. Sheng Zha in the AWS Deep-Engine Science team. Worked on developing synthetic instruction tasks for multi-task learning of LLMs.	Jun 2023 – Aug 2023
	Microsoft Research , Redmond, USA <i>Research Intern, Knowledge and Language Team (remote)</i> Mentored by Dr. Yichong Xu and Dr. Chenguang Zhu in the Knowledge and Language Team. Worked on pre-training of language models to incorporate logical reasoning abilities that are useful in downstream tasks.	Jun 2022 – Aug 2022
	Indian Institute Science , Bangalore, India <i>Research Assistant, MALL Lab</i> Hosted by Dr. Partha Talukdar, Department of Computational and Data Sciences, IISc (supported by Shell grant). Worked on graph neural networks and its applications in knowledge graph completion, protein modeling and material discovery.	Aug 2018 – Jun 2020
	Goldman Sachs Services Private Limited , Bangalore, India <i>Senior Analyst, Equities Risk Management</i> Part of the global team responsible for developing and managing the risk infrastructure of the equities desk. Worked on financial risk modeling, risk engines and risk monitoring.	Jun 2016 – Jul 2018
REFEREED CONFERENCE PROCEEDINGS	<ul style="list-style-type: none">[1] Soumya Sanyal, Tianyi Xiao, Jiacheng Liu, Wenya Wang, Xiang Ren. Are Machines Better at Complex Reasoning? Unveiling Human-Machine Inference Gaps in Entailment Verification. <i>Findings of the Association for Computational Linguistics ACL 2024</i>. [Paper][2] Faeze Brahman, Chandra Bhagavatula, Valentina Pyatkin, Jena D. Hwang, Xiang Lorraine Li, Hirona J. Arai, Soumya Sanyal, Keisuke Sakaguchi, Xiang Ren, and Yejin Choi. PLASMA: Procedural Knowledge Models for Language-based Planning and Re-planning. <i>The Twelfth International Conference on Learning Representations</i>. [Paper][3] Nouha Dziri, Ximing Lu, Melanie Sclar, Xiang Lorraine Li, Liwei Jian, Bill Yuchen Lin, Peter West, Chandra Bhagavatula, Ronan Le Bras, Jena D Hwang, Soumya Sanyal, Sean Welleck, Xiang Ren, Allyson Ettinger, Zaid Harchaoui, and Yejin Choi. Faith and Fate: Limits of Transformers on Compositionality. <i>Thirty-seventh Conference on Neural Information Processing Systems</i>. [Paper]	

- [4] Soumya Sanyal, Yichong Xu, Shuohang Wang, Ziyi Yang, Reid Pryzant, Wenhao Yu, Chenguang Zhu, and Xiang Ren. **APOLLO: A Simple Approach for Adaptive Pretraining of Language Models for Logical Reasoning**. *The 61st Annual Meeting of the Association for Computational Linguistics*. [Paper]
- [5] Wenhao Yu, Dan Iter, Shuohang Wang, Yichong Xu, Mingxuan Ju, Soumya Sanyal, Chenguang Zhu, Michael Zeng, and Meng Jiang. **Generate rather than Retrieve: Large Language Models are Strong Context Generators**. *The Eleventh International Conference on Learning Representations*. [Paper]
- [6] Soumya Sanyal, Zeyi Liao, and Xiang Ren. **RobustLR: Evaluating Robustness to Logical Perturbation in Deductive Reasoning**. *2022 Conference on Empirical Methods in Natural Language Processing*. [Paper | Code]
- [7] Soumya Sanyal, Harman Singh, and Xiang Ren. **FaiRR: Faithful and Robust Deductive Reasoning over Natural Language**. *60th Annual Meeting of the Association for Computational Linguistics (ACL 2022)*. [Paper | Code]
- [8] Soumya Sanyal and Xiang Ren. **Discretized Integrated Gradients for Explaining Language Models**. *2021 Conference on Empirical Methods in Natural Language Processing*. [Paper | Code]
- [9] Aaron Chan, Boyuan Long, Jiashu Xu, Soumya Sanyal, Tanishq Gupta, and Xiang Ren. **SalKG: Learning From Knowledge Graph Explanations for Commonsense Reasoning**. *Thirty-fifth Conference on Neural Information Processing Systems (NeurIPS 2021)*. [Paper | Code]
- [10] Zhiqing Sun*, Shikhar Vashishth*, Soumya Sanyal*, Partha Talukdar, and Yiming Yang. **A Re-evaluation of Knowledge Graph Completion Methods**. *2020 Annual Conference of the Association for Computational Linguistics*. (short) [Paper]
- [11] Soumya Sanyal*, Shikhar Vashishth*, Vikram Nitin, and Partha Talukdar. **Composition-based Multi-Relational Graph Convolutional Networks**. *International Conference on Learning Representations (ICLR-2020)*. [Paper | Code]
- [12] Soumya Sanyal*, Shikhar Vashishth*, Vikram Nitin, Nilesch Agrawal, and Partha Talukdar. **InteractE: Improving Convolution-based Knowledge Graph Embeddings by Increasing Feature Interactions**. *Thirty-Fourth AAAI Conference on Artificial Intelligence (AAAI-2020)*. [Paper | Code]
- [13] Ekagra Ranjan, Soumya Sanyal, and Partha Talukdar. **ASAP: Adaptive Structure Aware Pooling for Learning Hierarchical Graph Representations**. *Thirty-Fourth AAAI Conference on Artificial Intelligence (AAAI-2020)*. [Paper | Code]
- REFEREED WORKSHOP PAPERS [14] Aaron Chan, Boyuan Long, Jiashu Xu, Soumya Sanyal, Tanishq Gupta, and Xiang Ren. **SalKG: Learning From Knowledge Graph Explanations for Commonsense Reasoning**. *ICML 2021 Workshop on Theoretic Foundation, Criticism, and Application Trend of Explainable AI* [Paper]
- [15] Soumya Sanyal, Janakiraman Balachandran, Naganand Yadati, Abhishek Kumar, Padmini Rajagopalan, Suchismita Sanyal, and Partha Talukdar. **MT-CGCNN: Integrating Crystal Graph Convolutional Neural Network with Multitask Learning for Material Property Prediction**. *NeurIPS 2018 Workshop on Machine Learning for Molecules and Materials*. [Paper | Code]
- PREPRINTS [16] Ziyi Liu, Soumya Sanyal, Isabelle Lee, Yongkang Du, and Jieyu Zhao. **Self-Contradictory Reasoning Evaluation and Detection**. *Preprint*. [Paper]
- [17] Soumya Sanyal, Ivan Anishchenko, Anirudh Dagar, David Baker, and Partha Talukdar. **ProteinGCN: Protein model quality assessment using Graph Convolutional Networks**. *Preprint*. [Paper | Code]
- [18] Soumya Sanyal, Arun Kumar Sagotra, Narendra Kumar, Sharad Rathi, Mohana Krishna, Nagesh Somayajula, Duraivelan Palanisamy, Ram R Ratnakar, Suchismita Sanyal, Partha Talukdar, Umesh Waghmare, and Janakiraman Balachandran. **Potential energy surface prediction of Alumina polymorphs using graph neural network**. *Preprint*. [Paper]

SKILLS	Languages: Python, C++, C, Java, R, JavaScript, AJAX, NodeJS, MatLab, bash DL Frameworks: Pytorch, Pytorch Lightning, Tensorflow, Keras	
HONORS AND AWARDS	Graduate Fellowship Award from University of Southern California Travel grant for attending AAAI 2020, New York, USA Shell travel grant for attending NeurIPS 2018, Montreal, Canada Secured 617 rank (among approximately 0.50 million aspirants) in IIT-JEE Awarded KVPY scholarships, granted to approx. top 300 meritorious students in India Was in top 1% of total aspirants in National Standard Examination in Physics (NSEP) Was in top 1% of total aspirants in National Standard Examination in Astronomy (NSEA) 3 rd rank among 10,000 students in Inter DPS Science & Mathematics Talent Search Exam Awarded National Talent Search Examination (NTSE) Scholarship by NCERT	2020 2020 2018 2012 2012 2011 2011 2009 2008