Debjit Paul

github.com/debjitpaul debjitpaul.github.io linkedin.com/in/debjit-paul debjitpaulms@gmail.com

Education

Heidelberg University 2018 - 2022
Ph.D. in Computational Linguistics *Grade: Summa cum laude*
Advisor: Prof. Anette Frank

Saarland University 2014 - 2017
Msc. in Computer Science *Grade: 1.9*
Advisor: Prof. Ditrech Klakow

GuruNanak Insitute of Technology 2010 - 2014
B.Tech in Computer Science *Grade: 8.73/10*

Research Summary

My overarching research objective is to enhance the **reasoning capabilities of NLP systems** by advancing their ability to understand the complex interplay between language, knowledge representation, and cognitive reasoning processes. To accomplish this goal, I have focused my investigations in three areas:

- **Reasoning with knowledge representations** - NLP systems must be grounded by knowledge dynamics to generalize to unseen situations robustly. My research has focused on designing computational models capable of reasoning over knowledge.
- **Learning to generate explanations for reasoning** - When a model explains its decision-making steps or logical steps it took to reach that conclusion enhances transparency and helps build trust in the system. My research has focused on designing computational models that generate explanations before making the final decisions.
- **Aligning Models with Human or AI Feedback** - Text generation models are observed to display undesired and inconsistent behaviours, such as hallucination and unfaithful reasoning. My research has focused on designing methods to rectify the undesired behaviours of text generation models through interaction.

Work Experience

Postdoctoral Researcher at EPFL April 2022- Present
Host: Prof. Boi Faltings, Prof. Robert West
- Developed methods to enhance the reasoning capabilities of LLMs
- Designed new benchmark datasets to evaluate the reasoning capabilities of LLMs
- Developed reinforcement learning methods to enhance text generation capabilities of current NLP systems

Amazon Alexa AI Winter 2021
- Developed methods on continual learning for Intent Classification task

Selected Publications

Please see Google Scholar for the complete list of publications; * denotes equal contributions

11. *REFINER: Reasoning Feedback on Intermediate Representations* EACL 2024
Debjit Paul, Mete Ismayilzada, Maxime Peyrard, Beatriz Borges, Antoine Bosselut, Robert West, Boi Faltings

10. *CRoW: Benchmarking Commonsense Reasoning in Real-World Tasks*
Association for Computational Linguistics: EMNLP 2023
Mete Ismayilzada, **Debjit Paul**, Syrielle Montariol, Mor Geva, Antoine Bosselut

9. *CRAB: Assessing the Strength of Causal Relationships Between Real-world Events*
Association for Computational Linguistics: EMNLP 2023 Angelika Romanou, **Debjit Paul***, Syrielle Montariol*, Leo Laugier, Karl Aberer, Antoine Bosselut

8. *Language Model Decoding as Likelihood–Utility Alignment*
Findings of the Association for Computational Linguistics: EACL 2023
Martin Josifoski, Maxime Peyrard, Frano Rajič, Jiheng Wei, **Debjit Paul**, Valentin Hartmann, Barun Patra, Vishrav Chaudhary, Emre Kiciman, Boi Faltings and Robert West

7. *COINS: Dynamically Generating COntextualized Inference Rules for Narrative Story Completion*
Association for Computational Linguistics (ACL 2021)
Debjit Paul, Anette Frank

6. *Generating Hypothetical Events for Abductive Inference*
Proceedings of the Tenth Joint Conference on Lexical and Computational Semantics (*Sem 2021)
Debjit Paul, Anette Frank

5. *CO-NNECT: A Framework for Revealing Commonsense Knowledge Paths as Explicitations of Implicit Knowledge in Texts*
Proceedings of the 14th International Conference on Computational Semantics
Maria Becker, Katharina Korfhage, **Debjit Paul**, Anette Frank

4. *Social Commonsense Reasoning with Multi-Head Knowledge Attention*
Findings of the Association for Computational Linguistics: EMNLP 2020
Debjit Paul, Anette Frank

3. *Argumentative Relation Classification with Background Knowledge*
Proceedings of the 8^{th} International Conference on Computational Models of Argument (COMMA 2020)
Debjit Paul, Maria Becker, Juri Opitz, Graeme Hrist and Anette Frank

2. *Explaining Arguments with Background Knowledge*
Datenbank-Spektrum 20, 131–141 (2020)
Maria Becker, Ioana Hulpuş, Juri Opitz, **Debjit Paul**, Jonathan Kobbe, Heiner Stuckenschmidt, Anette Frank

1. *Ranking and Selecting Multi-Hop Knowledge Paths to Better Predict Human Needs* NAACL 2019
Debjit Paul, Anette Frank

Skills

Languages: C/C++, Python, LaTeX
Tools: Git/GitHub, Unix Shell, VS Code, PyCharm, Atom
Libraries: pandas, NumPy, Matplotlib, Tensorflow, pyTorch, spaCy, Transformers library

Honors and Awards

Nominated as Best Student paper at COMMA 2020
Facebook Travel Award for EurNLP 2019, London,UK
Winner of HQ Hackathon 2017, at Trivago, Dusseldorf, Germany

Services

Area Chair: EMNLP 2023, *SEM 2024
Program Committee: TACL 2023-2025, ACL 2023 & 2022, NAACL 2021, EMNLP 2022, 2021 & 2020, EACL 2023 & 2021, ARR, *SEM 2020 & 2021, CoNLL 2021, KI 2019, COIN 2019
Session Chair: EMNLP 2023

Mentoring

PhD Researchers

Angelika Romanou co-advised with Antoine Bosselut	Sept 2022 - June 2023
Shaobo Cui co-advised with Boi Faltings	Sept 2022 - June 2023

MS Researchers

Mete Ismayilzada, Topic: Commonsense Reasoning	Sept 2022 - June 2023
Rochat Mathieu Louis, Topic: Graph Continual Learning	Sept 2022 - April 2023
Gabriele D'Angeli, Topic: Reinforcement Learning for NLP	August 2023 - Present
Briki Farah, Topic: Reinforcement Learning for NLP	August 2023 - Present
Colin Baptiste Hofmann, Topic: Reasoning for NLP	August 2023 - Present

EPFL Summer Intern

Omar El Malki, Topic: Reinforcement Learning for NLP	June 2022 - Feb 2023
Luca Mouchel, Topic: Logical Fallacy	August 2023 - Present

Talks

Neuro-Symbolic Commonsense Reasoning in NLP

* Invited Talk at KU Leuven, 2022

Generating Contextualized Inference Rules for Narrative Story Completion

* Conference Presentation at ACL 2021

Multi-Head Knowledge Attention for Social Commonsense Reasoning

* Conference Presentation at EMNLP 2020
* Workshop Presentation at CODI 2020
* Invited Talk at Edinburgh Napier University 2020

Extracting Multi-Hop Knowledge Paths for Human Needs Classification

* Conference Presentation at NAACL 2019
* Invited Talk at AIPHES 2019

References

Prof. Anette Frank Email: frank@cl.uni-heidelberg.de
Prof. Boi Faltings Email: boi.faltings@epfl.ch
Prof. Robert West Email: robert.west@epfl.ch
Prof. Antoine Bosselut Email: antoine.bosselut@epfl.ch