Aman Madaan

Ph.D. candidate at LTI, CMU
Interested in large language models, language generation, and reasoning

https://madaan.github.io
amadaan@cs.cmu.edu
Google scholar, Github

EDUCATION

School of Computer Science, Carnegie Mellon University AUGUST 2019 - PRESENT
M.S. & Ph.D. Language Technologies (CPA: 4.20/4.33)
Advisor: Prof. Yiming Yang

Indian Institute of Technology Bombay, Mumbai JULY 2013 - JULY 2015
M.Tech. in Computer Science and Engineering (CPI: 10.0/10.0, Department Rank 1)
Thesis: Numerical Relation Extraction with Minimal Supervision

Guru Gobind Singh Indraprastha University, Delhi JULY 2009 - JUNE 2013
B.Tech. in Computer Science and Engineering (Percentage : 87.4, Department Rank 1)
Thesis: Distributed Compilation as a Service

INDUSTRY EXPERIENCE

- **Allen Institute for AI** *(Oct 2023 - Dec 2023)*
  (Student Researcher)
- **Google, Bard Team, CA** *(May 2023 - Aug 2023)*
  (Research Intern)
- **Allen Institute for AI** *(Oct 2022 - May 2023)*
  (Research Collaborator)
- **Google Brain, CA** *(May 2022 - August 2022)*
  (Student Researcher)
- **Oracle, Redwood Shores, CA** *(December 2017 - August 2019)*
  (Principal Member of Technical Staff)
- **Visa, Foster City, CA** *(August 2015 - December 2017)*
  (Senior Software Engineer/Decision Analytics Architect)

SELECTED PEER-REVIEWED PUBLICATIONS

- Alexander Shypula*, **Aman Madaan***, Uri Alon, Milad Hashemi, Parthasarathy Ranganathan, Yiming Yang, Graham Neubig, and Amir Yazdanbakhsh. Learning Performance-Improving Code Edits. *International Conference on Learning Representations, **ICLR**, 2024*

- **Aman Madaan**, Niket Tandon, Prakhar Gupta, Skyler Hallinan, Luyu Gao, Sarah Wiegreffe, Uri Alon, Nouha Dziri, Shrimai Prabhumoye, Yiming Yang, Sean Welleck, Bodhisattwa Prasad Majumder, Shashank Gupta, Amir Yazdanbakhsh, and Peter Clark. Self-Refine: Iterative Refinement with Self-Feedback. In *Conference on Neural Information Processing Systems (**NeurIPS**)*, **2023**

- **Aman Madaan***, Katherine Hermann, and Amir Yazdanbakhsh*. Text and Patterns: For Effective Chain of Thought, It Takes Two to Tango. ***EMNLP (Findings)***, **2023**

- Pranjal Aggarwal, **Aman Madaan**, Yiming Yang, and Mausam. Let's Sample Step by Step: Adaptive-Consistency for Efficient Reasoning with LLMs. ***EMNLP***, **2023**

- Patrick Fernandes, **Aman Madaan**, Emmy Liu, António Farinhas, Pedro Henrique Martins, Amanda Bertsch, José GC de Souza, Shuyan Zhou, Tongshuang Wu, Graham Neubig, et al. Bridging the gap: A survey on integrating (human) feedback for natural language generation. In *Transactions of the Association for Computational Linguistics (**TACL**), presented at **EMNLP***, **2023**

- Luyu Gao*, **Aman Madaan***, Shuyan Zhou*, Uri Alon, Pengfei Liu, Yiming Yang, Jamie Callan, and Graham Neubig. PAL: Program-aided Language Models. In ***International Conference on Machine Learning (ICML)***, **2023**

- **Aman Madaan**, Shuyan Zhou, Uri Alon, Yiming Yang, and Graham Neubig. Language Models of Code are Few-Shot Commonsense Learners. In ***EMNLP***, **2022**

- **Aman Madaan***, Niket Tandon*, Peter Clark, and Yiming Yang. Memory-assisted prompt editing to improve GPT-3 after deployment. In *EMNLP*, **2022**

- **Aman Madaan**, Dheeraj Rajagopal, Niket Tandon, Yiming Yang, and Antoine Bosselut. Conditional set generation using Seq2seq models. In *EMNLP*, **2022**

- **Aman Madaan** and Yiming Yang. FlowGen: Fast and slow graph generation. In *Workshop on Dynamic Neural Networks, International Conference on Machine Learning (ICML)*, **2022**

- Niket Tandon*, **Aman Madaan***, Peter Clark, and Yiming Yang. Learning to Repair: Repairing model output errors after deployment using a dynamic memory of feedback. In *NAACL (Findings)*, **2022**

- **Aman Madaan**, Niket Tandon, Dheeraj Rajagopal, Peter Clark, Yiming Yang, and Eduard Hovy. Think about it! Improving defeasible reasoning by first modeling the question scenario. In *EMNLP*, **2021**

- **Aman Madaan***, Dheeraj Rajagopal*, Niket Tandon*, Yiming Yang, and Eduard Hovy. Could you give me a hint ? Generating inference graphs for defeasible reasoning. In *ACL (Findings), 2021*

- **Aman Madaan** and Yiming Yang. Neural Language Modeling for Contextualized Temporal Graph Generation. In *NAACL, 2021*

- Amrith Setlur*, **Aman Madaan***, Tanmay Parekh*, Yiming Yang, and Alan W Black. Towards Using Heterogeneous Relation Graphs for End-to-End TTS. In *2021 IEEE Automatic Speech Recognition and Understanding Workshop (ASRU)*, **2021**

- **Aman Madaan***, Amrith Setlur*, Tanmay Parekh*, Barnabas Poczos, Graham Neubig, Yiming Yang, Ruslan Salakhutdinov, Alan W Black, and Shrimai Prabhumoye. Politeness Transfer: A Tag and Generate Approach. In *ACL, 2020*

- **Aman Madaan**, Shruti Rijhwani, Antonios Anastasopoulos, Yiming Yang, and Graham Neubig. Practical Comparable Data Collection for Low-Resource Languages via Images. *PML4DC Workshop, International Conference on Learning Representations (ICLR)*, **2020**

- **Aman Madaan**, Ashish Mittal, Mausam, Ganesh Ramakrishnan, and Sunita Sarawagi. Numerical Relation Extraction with Minimal Supervision. In *Thirtieth AAAI Conference on Artificial Intelligence*. **AAAI**, **2016**

PRE-PRINTS

- **Aman Madaan***, Pranjal Aggarwal*, Ankit Anand, Srividya Pranavi Potharaju, Swaroop Mishra, Pei Zhou, Aditya Gupta, Dheeraj Rajagopal, Karthik Kappaganthu, Yiming Yang, et al. AutoMix: Automatically Mixing Language Models. *arXiv preprint arXiv:2310.12963*, 2023

- Pei Zhou, **Aman Madaan**, Srividya Pranavi Potharaju, Aditya Gupta, Kevin R McKee, Ari Holtzman, Jay Pujara, Xiang Ren, Swaroop Mishra, Aida Nematzadeh, et al. How FaR Are Large Language Models From Agents with Theory-of-Mind? *arXiv preprint arXiv:2310.03051*, 2023

INVITED TALKS AND TUTORIALS

- **Complex Reasoning with LLMs using Few-shot prompting**, *Invited Tutorial*, **IEEE-EMBS International Conference on Biomedical and Health Informatics (BHI23), October 2023** (*code and slides*)

- **Complex Reasoning in Natural Language**, *ACL 2023 Tutorial*, **ACL, July 2023** (*website, paper*)

- **Code-Assisted Reasoning with LLMs**, *Cohere AI Talk*, **Cohere For AI Regional Asia group , Oct 2023** (*slides*)

- **Self-Refining Language Models**, *NVIDIA NLP Reading Group*, **NVIDIA, April 2023**

- **Language Models of Code are Few-shot Reasoners**, *UIUC-NLP Seminar* , **UIUC, December 2022** (*slides*)

- **Text and Patterns - For Effective Chain of Thought, It Takes Two to Tango**, *Reasoning Research Weekly and N2Formal Literature Review*, **Google, October 2022** (*slides*)

- **Commonsense Reasoning with Large Language Models**, *CMU 11741, Machine Learning for Text and Graph-Based Mining Guest Lecture*, **CMU, November 2022** (*slides*)

AWARDS & ACHIEVEMENTS

- **Best Reviewer Awards: EMNLP 2023, Neurips 2023, EACL 2021**
- **Accelerate Foundation Models Research Grant** by Microsoft, $20,000 in compute credits, **2023**
- **Research Fellowship** by Carnegie Mellon University, covers 100% tuition for the Masters' (approximately $45,000/year) and stipend, **2019-2021**
- **Above and Beyond Award** by Visa Inc., **Awarded six times** for work done on the Customer Segmentation Platform, SpendBot, leading initiatives that led to successful demos and technical talks, and *extraordinary contributions to the business*, **Jan 2016 - October 2017**.
- **Promoted within 11 months** of starting at Visa to Senior Decision Analytics Architect *(the average time for promotion to the level is **4 years**)*, **September 2016**.
- **TA Excellence Award** by Dept. of C.S.E., IIT Bombay, for work done while assisting Prof. Saketha Nath in **CS 725 (Foundations of Machine Learning)**, **October 2015**.
- **Ajit Shelat Award**, *Given to a deserving M. Tech. student from the EE Dept and CSE Dept combined with the highest CPI*, 53rd Convocation, IIT Bombay, **August 2015**.
- **Institute Silver Medal**, 53rd Convocation, IIT Bombay, **August 2015**.
- **TCS Best Student Award**, Presented to **100 students across India**, **April 2013**.
- **All India Rank 9** in Graduate Aptitude Test in Engineering (GATE) 2013 out of **224,160** candidates, **March 2013**.
- **Excellence in Academics Award**, Lambda Eta Chapter, IEEE-HKN, BVCOE, New Delhi, **October 2012**.

PATENTS

- Krishnan Ramanathan, Gangadhar Ronanki, and **Aman Madaan**. System and method for automatic generation of extract, transform, load (etl) asserts, October 31 2023. US Patent 11,803,798

- Krishnan Ramanathan, Jagan Narayanareddy, Gunaranjan Vasireddy, and **Aman Madaan**. System and method for determining an amount of virtual machines for use with extract, transform, load (etl) processes, March 28 2023. US Patent 11,614,976

- **Aman Madaan**, Jagdish Chand, Somashekhar Pammar, Venkata Sesha Rao Polavarapu, Sunil Sharma, Tarun Jain, Dirk Reinshagen, Derek Vroom, et al. Segmentation platform using feature and label pairs, October 25 2022. US Patent 11,481,661

- Ranjan Dutta, Varun Sharma, **Aman Madaan**, Somashekhar Pammar, and Zian Huang. Database conditional field access, August 10 2021. US Patent 11,086,871

PROFESSIONAL ACTIVITIES

- **Action Editor** (Area Chair): Association for Computational Linguistics Rolling Review (ACL ARR), December 2023-Present

- Program Committee Member (**Reviewer**): ACL ARR (2021 - present), ACL, EMNLP, NAACL (2020 - present), AAAI (2021 - present), EACL 2021, AACL 2022, ICLR (2022, 2023, 2024), Neurips (2022,2023), ICML (2023 - present)

- **Organizer**, Workshop on Benchmark Evaluation for Natural Language Generation (GEM), ACL 2021

SKILLS

- **Currently using:** Python, Pytorch, Bash.

- **Prior Professional Experience:** Jax/Flax, Scala, Java, C++, Tensorflow, Apache Spark, Apache Hadoop