ADITYA PARASHAR

Amherst, Massachusetts

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EDUCATION

University of Massachusetts, Amherst   *2023 - Present*
MS, Computer Science
Courses: *Advanced NLP ↗ , Distributed & Operating Systems, Algorithms for Data Science, Probabilistic Graphical Models*

Indian Institute of Technology(IIT), Guwahati   *2014 - 2018*
B.Tech, Mechanical Engineering(Minor in Mathematics)
Courses: *Computational Fluid Dynamics, Scientific Computing, Mathematical Statistics*

RESEARCH EXPERIENCE

Oracle   *June - September 2024*
Research Intern [under review at a conference]
- Defined the task of operations research problem re-formulation and created a dataset to test LLMs' ability to handle formulation changes through *what-if* questions.
- Showed that state-of-the-art LLMs struggle with this task, especially as problem complexity increases, highlighting their limitations in operations research reasoning.

Google   *February - May 2024*
Graduate Student Researcher [under review at a conference]
- Implemented arithmetic sampling, an embarrassingly parallel strategy for generating diverse sequences from large language models.
- Evaluating this in conjunction with self-consistency based decoding for reasoning tasks and with minimum bayes risk(MBR) decoding for machine translation tasks.

Information Extraction and Synthesis Lab(IESL), UMass   *September-December 2024*
Graduate Student researcher, Prof. Andrew Mccallum [submission under preparation]
- Developed a comprehensive framework for evaluating probability calibration techniques in zero-shot LLM inference, including an inverse consistency-based decoding-time strategy.
- Conducted extensive analysis using task-specific metrics to identify correlations between surface form competition and task performance, spanning a taxonomy of benchmarks and LLMs.

UMass BioNLP lab   *June 2023 - May 2024*
Graduate Research Assistant, Prof. Hong Yu [under review at a conference]   *git repo ↗*
- Engineered a USMLE question generation system using a **self-refining** LLM(GPT-3+) based framework.
- Incorporated in context learning using clinical notes and a question bank into the prompts. Integrated a self-feedback loop with fine-grained feedback rubrics for iterative improvement.

Language Technology Research Centre, IIIT-Hyderabad   *March 2022 - January 2023*
Research Intern, with the guidance of Dr. Sukhada, IIT BHU   *git repo ↗*
- Worked on interlingua-based machine translation, involving the development of language-independent Universal Semantics Representation (**USR**) datasets for Hindi and Sanskrit by parsing multilingual data.
- Collaborated with linguists to develop algorithms for USR graph linearization, enhancing **model (MT5 and BART) performance** for sentence generation through finetuning.

WORK EXPERIENCE

Agility E Services, Hyderabad   *July 2018 - Sept 2022*
Software Engineer(Technology Specialist)
- **IPaaS:** Developed a scalable, multi-tenant cloud integration platform (**IPaaS**) for facilitating automated data integration between cloud and on-premises applications.
  - Implemented a Windows service for scheduling jobs within the IPaaS web studio, orchestrating its deployment through a customizable installer package for streamlined execution and management of jobs.
  - Engineered **security** protocols like role based access to the application, and secured **Azure** services like service bus, PostgreSQL server, and app services of the IPaaS using **Microsoft Sentinel**.

- **Procurement platform:** Worked on the development of an inventory purchase and order management web application in sync with a cross-functional agile team.
  – Migrated the application from monolithic to a distributed **microservices** architecture while incorporating the continuous integration and deployment (CI/CD) pipeline for reliability.
  – Implemented the command and query responsibility segregation (**CQRS**) design pattern to ensure scalability, synchronization and management of workloads.

RESEARCH PROJECTS

Interpreting figurative language using prompting *Spring '23*
Adv. NLP course project, Prof. Mohit Iyyer *paper* ⧉
- Leveraged different prompting strategies to get better literal translations for figurative language texts, specifically Metaphor, Idiom, Simile and Sarcasm
- Used zero-shot prompting as our baseline and then tested few-shot prompting, instruction prompting and chain of thought prompting to compare performances across these strategies.

TECHNICAL SKILLS

Programming Languages	Python, C# , Java, Typescript, Javascript, SQL
ML & Development Frameworks	numpy, Pytorch, CUDA, Huggingface, Angular, .NET Core, Linux