# Kumar Shridhar

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## Research Interests

My research and professional interests are centered around Natural Language Processing and Machine Learning, especially towards understanding the capabilities of LLMs. My PhD reseach investigate how generative LLMs reason, what factors affect their reasoning performance, and how to optimize their reasoning skills. Before starting my PhD, I gained valuable experience in building and deploying conversational AI systems at two innovative startups.

## Education

Aug '21 - Dec '24 — *PhD in Computer Science, ETH Zürich*
**Specialization**: Machine Learning, NLP, Generative AI
**Supervisor**: Prof. Mrinmaya Sachan, Nicholas Monath

Apr '16 - June '20 — *Masters in Computer Science, University of Kaiserslautern*
**Specialization**: Machine Learning, **Minor**: Pyschology

## Selected Publications

ACL '23 Findings — Distilling Reasoning Capabilities into Smaller Language Models
**Kumar Shridhar***, Alessandro Stolfo* & Mrinmaya Sachan

EMNLP '22 — Automatic Generation of Socratic Questions for Math Word Problems
**Kumar Shridhar***, Jakub Macina*, Mennatallah El-Assady, Tanmay Sinha, Manu Kapur & Mrinmaya Sachan

NeurIPS '22 — Learning to Drop Out: An Adversarial Approach to Training Sequence VAEs
**Kumar Shridhar***, Djordje Miladinovic*, Kushal Jain, Max B. Paulus, Joachim M. Buhmann, Mrinmaya Sachan & Carl Allen

ACL '23 — A Causal Framework to Quantify the Robustness of Mathematical Reasoning with Language Models
Alessandro Stolfo, Zhijing Jin, **Kumar Shridhar**, Bernhard Schoelkopf & Mrinmaya Sachan

EACL '23 — LongtoNotes: OntoNotes with Longer Coreference Chains
**Kumar Shridhar**, Nicholas Monath, Raghuveer Thirukovalluru, Alessandro Stolfo, Manzil Zaheer, Andrew McCallum & Mrinmaya Sachan

## Work Experience

Aug '23 - Nov '23 — Research Intern at **Meta**
- Working on improving the reasoning capabilities of LLMs

May '23 - Aug '23 — Research Intern at **Microsoft Research (Semantic Machines)**
- - Introduced a framework for reasoning with revisions that enables LLMs (ChatGPT and GPT-4) to iteratively improve their predictions on various reasoning tasks.

May '21 - Aug '21 — Applied Research Intern at **Amazon Alexa AI**
- Worked on a constrained optimization formulation for training a deep neural network with a set of hard constraints on output labels.

## Others

- Contributor to the BIG-bench task to understand the capabilities of large LMs.
- Reviewer : ICLR '20, '21, '22, NeurIPS '20, '22, '23, EMNLP '22, AAAI '21
- Google Cloud research grant worth 5k USD.
- Techincal Reviewer of Book: Advanced Natural Language Processing with TensorFlow.
- Kaggle Top 1%: Rank 5 in Plant Seedling Identification challenge.