Mourad Heddaya

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Education

Ph.D. Student in Computer Science, 2021-,
University of Chicago, Chicago, IL.
Advisor: Chenhao Tan

B.S. in Informatics, 2015-2019,
University of Washington, Seattle, WA.
Research Supervisor: Noah Smith & Mari Ostendorf

Publications

[1] *Language of Bargaining*
     Mourad Heddaya, *S. Dworkin, R. Voigt, A. Zentefis, C. Tan*
     Annual Meeting of the Association for Computational Linguistics (ACL), 2023.

Research Experiences

Research Internships

06/2023-09/2023, AWS AI Labs, Bedrock Team, *Mentor: Miguel Ballesteros*
- Proposed self-supervised alignment, an efficient method for aligning LLMs to human preferences for summarization and toxicity without RLHF (without RL and with less human feedback)
- Allow the model to score its own hypotheses (sampled sentences) and incorporate it as self-feedback in the SFT loop, providing more effective regularization for better alignment.
- *Paper in progress*

Graduate Research, University of Chicago

07/2022-01/2023, *Collaborators: C. Tan (UChicago), R. Voigt (Northwestern), A. Zentefis (Yale)*
Language of Bargaining - ACL 2023
- Built a novel dataset for studying how the use of language shapes bilateral bargaining.
- Proposed a taxonomy of speech acts in negotiation and enrich the dataset with annotated speech acts.
- Found that when subjects can talk, fewer offers are exchanged, negotiations finish faster, the likelihood of reaching agreement rises, and the variance of prices at which subjects agree drops.
- Set up prediction tasks to predict negotiation success from audio transcripts and find that being reactive to the arguments of the other party is advantageous over driving the negotiation.

2023-, *Collaborators: C. Tan (UChicago), R. Voigt (Northwestern), A. Zentefis (Yale)*
- **[in progress]** Using semantic role labeling, developed structured representations of economic narratives, defined as a cause and effect associated with an economic topic.
- To improve signal/noise ratio we set up an entailment (NLI) task for reducing the total number of distinct narratives. Using density-based clustering, we identify distinct and recurring narratives.

- We plan to design time-series analyses to examine how these narratives spread across different regions and over time, like a contagion in order understand how economic narratives shape economic outcomes and help policymakers make more informed decisions.

2022-, Collaborator: Allyson Ettinger (UChicago), Kanishka Misra (Purdue)
- **[in progress]** Is it ultimately worthwhile for a pre-trained LM to learn to represent complex contextual meaning, in order to optimize its objective?
- We compare predictions across a range of LMs with different representational capabilities and constraints (e.g. only syntax, topic, co-occurrence, etc.) We compare with human predictions to identify most useful information for language modeling.

Research Engineer, University of Washington, 2020-2021,
  Advisors: Noah Smith, Mari Ostendorf

- Industry collaboration designing and developing unsupervised & supervised information extraction systems to model noisy real-world conversational speech data.
- Based on learned topology from unsupervised HMM, identified distinct conversation paths corresponding to low & high customer service issue resolution, providing insight into successful vs unsuccessful interactions. Final methods and analyses delivered to industry partner.

Research Assistant, University of Washington, 2019-2020,
  Advisors: Noah Smith, Sofia Serrano (PhD Student Supervisor)

- Designed and conducted error and interpretability analysis on three state-of-the-art multi-hop question-answering models.
- Analyzed model training dynamics to identify subset of data that improves model training time and performance. Followed-up with causal linguistic analysis of the data

Invited Talks

University of Chicago,
  Language Evolution Acquisition & Processing Workshop (LEAP), January 2023
  Talk Title: Language of Bargaining

Teaching Assistantships

University of Chicago,
  CMSC 25400 – Machine Learning, Winter 2023
  CMSC 25300 / 35300 – Mathematical Foundation of Machine Learning, Fall 2022
  CMSC 35100 - Natural Language Processing, Winter 2022