XINRAN ZHAO

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EDUCATION

Stanford University   *2021 - now, CA*

- Master of Computer Science (GPA=3.88/4), advised by Shikhar Murty and Prof. Christopher Manning.

The Hong Kong University of Science and Technology   *2016 - 2020, HK*

- Bachelor of Engineering in Computer Science (GPA=3.96/4), advised by Hongming Zhang, Prof. Yangqiu Song, and Prof. Dit-Yan Yeung.
- Academic Achievement Medal (Top 1%), Continuous Undergraduate Scholarship (Top 5%), First Class Honors, Dean's List.
- Relevant Coursework:
  Explore & Visualize Data; OOP & Data Structures (Honor); Discrete Math Tools; Design of Algo. ; Statistical Learning Models for Text and Graph Data (Graduate Level); Big Data Mining & Management; Deep Learning for Computer Vision; Matrix Algebra

Cornell University   *2018 - 2019, NY*

- International Exchange Program in Computer Science, advised by Esin Durmus and Prof. Claire Cardie.
- Relevant Coursework: Machine Learning; Natural Language Processing; Operating Systems

SELECTED PUBLICATIONS

Conferences and Journals

1. On Measuring the Intrinsic Few-Shot Hardness of Datasets
In Proceedings of **EMNLP 2022** (to appear), **Xinran Zhao***, Shikhar Murty*, and Christopher Manning (*: equal contribution)

- *Brief*: We first show that few-shot hardness is empirically an intrinsic property of datasets by demonstration the correlation among various methods. We then design an efficient metric that achieves better measurement on such intrinsic hardness than previous ones.
- *Contribution*: propose the ideas; design and run the experiments; write and review the draft with collaborators.

2. PCR4ALL: A Comprehensive Evaluation Benchmark for Pronoun Coreference Resolution (Link)
In Proceedings of **LREC 2022**, **Xinran Zhao**, Hongming Zhang, and Yangqiu Song

- *Brief*: We propose a novel benchmark to bridge the gap between document- and sentence-level PCR tasks, and evaluate the real-world robustness of systems through analysis from different angles including varying knowledge sources, domains, frequency, bias, and etc.
- *Contribution*: propose the ideas; design and run the experiments; write and review the draft with collaborators.

3. Weakly Supervised Text Classification Using Supervision Signals from a Language Model (Link)
In Findings of **NAACL 2022**, Ziqian Zeng, Weimin Ni, Tianqing Fang, Xiang Li, **Xinran Zhao**, and Yangqiu Song

- *Brief*: We propose to improve weakly supervised learning by estimating label word distribution via probing models with various prompts. Empirical results show that involving the relations between such distribution and pre-defined categories leads to consistent gain.
- *Contribution*: design and run the part of the experiments; help write and review the draft with collaborators.

4. Leveraging Topic Relatedness for Argument Persuasion (Link)
In Findings of **ACL 2021**., **Xinran Zhao**, Esin Durmus, Hongming Zhang, and Claire Cardie

- *Brief*: Previous study on argument persuasion mainly focuses on audience and language style factors. In this work, we model the relatedness among controversial topics and individuals' stances and leverage such to incorporate topic semantics in predicting persuasiveness.
- *Contribution*: propose the ideas; design and run the experiments; write and review the draft with collaborators.

5. Probing Toxic Content in Large Pre-Trained Language Models (Link)
In Proceedings of **ACL 2021**, Nedjma Ousidhoum, **Xinran Zhao**, Tianqing Fang, Yangqiu Song, and Dit-Yan Yeung

- *Brief*: We propose to quantify the potentially harmful content in large multilingual language models at scale through building a large set of probing queries generated by pattern-matching on Knowledge Graphs with respect to various potentially vulnerable social groups.
- *Contribution*: propose the idea in discussion; design and run part of the experiments; help write and review the draft with collaborators.

6. WinoWhy: A Deep Diagnose of Essential Commonsense Knowledge for Answering Winograd Schema Challenge (Link)
In Proceedings of **ACL 2020**, Hongming Zhang*, **Xinran Zhao***, and Yangqiu Song (*: equal contribution)

- *Brief*: Pre-trained language models show great performance on various benchmark on commonsense reasoning. However, we show that they are still far from solving such problems by challenging them with a transferable task requiring identification of correct reasoning.
- *Contribution*: propose the idea in discussion; design and run the experiments; write and review the draft with collaborators.

7. Learning Contextual Causality between Daily Events from Time-consecutive Images (Link)
In **Causality in Vision @ CVPR 2021**, Hongming Zhang, Yintong Huo, **Xinran Zhao**, Yangqiu Song, and Dan Roth

- *Brief*: We design a novel task on mining contextual causal knowledge from consecutive frames in videos and propose a Vision-Contextual Causal model as an effective way to represent the events in real-world images.
- *Contribution*: collect and rectify the dataset; design and run part of the experiments; help write and review the draft with collaborators.

8. A Brief Survey and Comparative Study of Recent Development of Pronoun Coreference Resolution in English (Link)
In **CRAC @ EMNLP 2021**, Hongming Zhang, **Xinran Zhao**, and Yangqiu Song

- *Brief*: We survey on various models and datasets in the area of Pronoun Coreference Resolution and show that unfamiliar, out-of-domain, or knowledge-intensive examples and hyperparameter changes are still challenging problems for current models.
- *Contribution*: propose part of the ideas; design and run the experiments; help write and review the draft with collaborators.

9. The Effects of Fear of Missing Out on Social Media Posting Preferences
In **European Journal of Marketing**, Yue Xi, Jiale Huo, **Xinran Zhao**, Yushi Jiang, and Qiang Yang

- *Contribution*: design and apply NLP tools to analyze the social media posts on users' sentiment towards different aspects.

Under Submission

1. Towards Adaptive Usage for External Knowledge in NLP Tasks
Xinran Zhao, Hongming Zhang, Xiaoman Pan, Wenlin Yao, Dong Yu, and Jianshu Chen

- *Brief*: We propose to improve the cost-efficiency and performance on task-plus-external knowledge paradigm by scoring the queries at instance level based on the model familiarity and rejecting potentially noisy and unnecessary external knowledge. Around 26% improvement is observed on 88% cases with classification and question-answering tasks.
- *Contribution*: propose the ideas; design and run the experiments; write and review the draft with collaborators.

2. Towards Reference-free Text Simplification Evaluation
Xinran Zhao and Dit-Yan Yeung

- *Brief*: We present *BETS* as a lightweight reference-free text simplification (TS) metric that leverages BERT and large-scale paraphrasing datasets to evaluate input-output pairs directly. Experiments show that *BETS* correlates better than existing metrics with human judgments. Controllable coefficients and reference-free property further improve the applicability and transferability of TS models.
- *Contribution*: propose the ideas; design and run the experiments; write and review the draft with collaborators.

3. EPIC-States: A Benchmark on Understanding Object State Change
submitted to **CVPR 2023**, Xiang Li, Jiangwei Yu, **Xinran Zhao**, Hongming Zhang, and Yu-Xiong Wang

- *Contribution*: propose the ideas in discussion; design and run the textual annotations and experiments; help write and review the draft.

4. Beyond the Imitation Game: Quantifying and extrapolating the capabilities of language models (Link)
submitted to **Transactions on Machine Learning Research (TMLR)**, a large-scale collaborative work

RESEARCH AND WORK EXPERIENCE

Stanford NLP Group *Oct 2021 - now, Stanford*
Research Assitant. **Advisor:** Prof. Christopher Manning

Tecent AI Lab @ Bellevue *June 2022 - Sep 2022, Bellevue*
Research Intern in NLP. **Advisor:** Hongming Zhang, Xiaoman Pan, Wenlin Yao, Dong Yu, and Jianshu Chen

HKUST ML Group *Sep 2020 - Feb 2021, HKUST*
Research Assitant. **Advisor:** Prof. Dit-Yan Yeung

INVITED TALKS AND ACADEMIC SERVICE

On Task Difficulty of Few-shot Learning: ICML 2022 Commonsense Tutorial, *Summer 2022*.

NLP as a Tool for Scientific Discovery: Department of Marketing @ National University of Singapore, *Sping 2022*.

Service: Reviewer for AKBC 2023, AAAI 2023, EMNLP 2022, ECCV 2022(emergent reviewer).

SKILLS

Programming & Framework: Python/C++/Java/JavaScript. Familiar with Matlab, Rust, Racket, Lean; Pytorch, Tensorflow, Keras, AllenNLP, Spacy, NLTK, Amazon Turk, and etc.

Languages: English (Proficient, with TOEFL=112), Mandarin (Native).

Debate: HKUST Madarin Debate Team: Championship for Bayarea Debate Invitational; Top 8 for the Sixth and Seventh International Mandarin Debate Invitational in Singapore.

Interests: Archery, Gym, Seal Engraving, Basketball, Traditional Chinese Poem Writing