ZIWEI JI

Email: zjiad@connect.ust.hk ⋄ Website: ziweiji.github.io ⋄ Phone: +852-67431247

EDUCATION

The Hong Kong University of Science and Technology   Hong Kong, China
Ph.D. Candidate in ECE Department (NLP, Supervisor: Pascale Fung)   Sept. 2019 - Present
Huazhong University of Science and Technology   Wuhan, China
B.Sc. in Electronic Science and Technology (GPA: 3.97/4.0, Rank: 1/156, Honored)   Sept. 2015 - Jun. 2019

SELECTED AWARDS

National Scholarship (3 times, Top 0.2%), Ministry of Education of P.R.China	2016, 2017, 2018
Second Prize of Hubei Province in National Undergraduate Mathematics Competition	2017
Merit Student at Huazhong University of Science and Technology (3 times, Top 3%)	2016, 2017, 2018
Outstanding Overseas Exchange Undergraduate in UC Berkeley Hi-Tech Program	2017
Outstanding Undergraduate in Terms of Academic Performance (Top 1%)	2016

PROJECT

Reducing Hallucination in Open-domain Dialogues   Aug. 2022 - Jan. 2023

- Dialogue systems can leverage large pre-trained language models and knowledge to generate fluent and informative responses. However, these models are still prone to produce hallucinated responses not supported by the input source. We adopt the dataset OpenDialKG containing 15k open-domain dialogues grounded on the knowledge graph (KG).
- To handle the heterogeneity between external knowledge and dialogue context and generate more faithful responses, we propose RHO with 1) Local Knowledge Grounding combining textual embeddings with the corresponding KG embeddings. 2) Global Knowledge Grounding via the attention mechanism for multi-hop reasoning abilities. 3) A response re-ranking technique based on walks over KG sub-graphs for better conversational reasoning.
- Experimental results show that our approach significantly outperforms SOTA on both automatic and human evaluation by a large margin, especially in hallucination reduction (17.54% in FeQA).

AI Film   Feb. 2021 - Feb. 2022

- In order to offer a customized film tool and inspire professional filmmakers, we present an automatic, real-time film-producing system cooperating with the Central Academy of Fine Arts.
- We adopt a hierarchical structure, which first generates the plot, then the script and its visual presentation: 1) Design a genre-controllable and plot-guided film script generation system. 2) Collect a video database from social media and retrieve video clips based on the scripts. 3) Develop a user interface for demonstration.
- The experiment results show that our approach outperforms the baselines on both automatic and human evaluations, especially in genre control.
- Exhibited at Pingyao International Film Festival and Xu Bing's Language Art Exhibition. Published in AACL Demo.

Probing Object Hallucination in Vision-Language Pre-training   Sept. 2022 - Jan. 2023

- Large-scale vision-language pre-trained (VLP) models are prone to hallucinate non-existent visual objects when generating text based on visual information.
- We systematically study the object hallucination problem: 1) Examine recent SOTA VLP models, showing that they still hallucinate frequently, and models achieving better scores on standard metrics (e.g., CIDEr) could be more unfaithful. 2) Investigate how different types of image encoding in VLP influence hallucination, including region-based, grid-based, and patch-based. We find that patch-based features perform the best and smaller patch resolution yields a non-trivial reduction in object hallucination. 3) Decouple various VLP objectives and demonstrate that token-level image-text alignment and controlled generation are crucial to reducing hallucinations. Based on that, we propose a simple yet effective VLP loss named ObjMLM to further mitigate object hallucination.

- Experimental results show that our approach reduces object hallucination by up to 17.4% when tested on COCO Caption for in-domain and NoCaps for out-of-domain evaluation.
- Published in EACL.

Numerical simulation of electrodynamic phenomena in nanofluidics   Sept. 2017 - Feb. 2018
Wuhan National Laboratory for Optoelectronics

- Develop simulation models with new physical mechanisms, which coincide with actual experimental results and give theoretical explanations for: 1) the effect of ionization equilibrium on the electrokinetic flow of weak electrolytes in nanopores. 2) the effect of membrane surface charge on ion transport in nanopore power generation devices.
- Published two papers in Nanotechnology and Applied Physics Letters during undergraduate.

SELECTED PUBLICATIONS

RHO(ρ): Reducing Hallucination in Open-domain Dialogues with Knowledge Grounding   ACL 2023 Findings
Ziwei Ji, Zihan Liu, Nayeon Lee, Tiezheng Yu, Pascale Fung, et al.

Survey of Hallucination in Natural Language Generation   ACM Computing Surveys 2022
Ziwei Ji, Nayeon Lee, Rita Frieske, Pascale Fung, et al.

VScript: Controllable Script Generation with Visual Presentation   AACL Demo 2022
Ziwei Ji, Yan Xu, I-Tsun Cheng, Pascale Fung, et al.

Plausible May Not Be Faithful: Probing Object Hallucination in Vision-Language Pre-training   EACL 2023
Wenliang Dai, Zihan Liu, Ziwei Ji, Dan Su, Pascale Fung

Multi-hop Question Generation with Graph Convolutional Network   EMNLP 2020 Findings
Dan Su, Yan Xu, Wenliang Dai, Ziwei Ji, Tiezheng Yu, Pascale Fung

Model Generalization on COVID-19 Fake News Detection   ACL CONSTRAINT 2021
Yejin Bang[1], Etsuko Ishii[1], Samuel Cahyawijaya[1], Ziwei Ji[1], Pascale Fung

SKILLS AND OTHERS

Sub-Tasks	Have experience in Dialogue Generation, Storytelling, Image Captioning, NER, Question Generation, Fake News Detection
Academic Service	Reviewer in EMNLP and ACL
Programming Language	Python, C, Java, JavaScript, MATLAB
Skills	Pytorch, TensorFlow, DeepSpeed, Linux, Git, SVN
Languages	Chinese (Mother Tongue), English (Full-Proficiency, IELTS 7)

---

[1]Equal Contribution