

# Junyi Li (李军毅)

City University of Hong Kong  
(+86) 15650717704  
cheneyjuniyi@gmail.com

## Education

- 2021–2025 **Doctor of Computer Science**, Université de Montréal, Montréal, Canada.  
Advisor: Prof. Jian-Yun Nie
- 2020–2024 **Doctor of Artificial Intelligence**, Renmin University of China, Beijing, China.  
Advisor: Prof. Xin Zhao
- 2018–2020 **Master of Computer Application Technology**, Renmin University of China, Beijing, China.  
Advisor: Prof. Xin Zhao
- 2014–2018 **Bachelor of Computer Science and Technology**, Renmin University of China, Beijing, China.  
Advisor: Prof. Xin Zhao

## Work Experience

### Department of Data Science, City University of Hong Kong

- August,2025 **Self-Evolving and Trustworthy Multi-Agent Systems.**  
– present Developing a new generation of self-evolving and trustworthy multi-agent systems that balance accuracy, efficiency, and reliability in real-world deployment.  
Advisor : **Prof. Xiangyu Zhao**, Associate Professor, Department of Data Science, City University of Hong Kong ([Personal Web-page](#))
- Department of Computer Science, National University of Singapore**
- July,2024 – **Trustworthy and Factual Large Language Models.**  
July,2025 Proposed a factuality-aware RL training approach for large reasoning models and an MCTS-based inference approach to grounded text generation.  
Advisor : **Prof. Hwee Tou Ng**, Provost's Chair Professor (ACL Fellow), Department of Computer Science, National University of Singapore ([Personal Web-page](#))

## Research Interests

My research interests lie broadly in natural language processing and large language models, with an emphasis on building trustworthy and evolving proactive AI agents.

- **Hallucination Evaluation & Mitigation:** Developed the HaluEval 2.0 benchmark for hallucination detection and analysis; built the HaluAgent framework to enable smaller LLMs to detect hallucinations; introduced tree-search and reinforcement-learning methods such as FSPO and Think&Cite to reduce factual errors.
- **Planning, Reasoning & Self-Verification:** Designed multi-agent deep-search frameworks (ManuSearch), retrieval-augmented reasoning methods (RAG-Star), and globally guided Monte Carlo tree search (HG-MCTS) that allow LLM agents to plan, search, and verify their reasoning. Proposed adaptive cognitive optimization (ACPO) to balance fast and slow thinking.
- **Memory & Domain Adaptation:** Proposed long-context evaluation and restoration methods (BAMBOO, LongReD) and a domain adaptation framework (Mix-CPT) to equip agents with persistent memory and adaptability across domains and long inputs.

- I am also interested in research that advances the complex reasoning capability of multi-modal AI systems to facilitate their understanding and reasoning on our real world such as LAMOC and PAL-UI.

## Publications

<sup>†</sup> Equal contribution \* Corresponding author

### Journal Articles

- 2024 **Junyi Li**, Tianyi Tang, Wayne Xin Zhao, Jian-Yun Nie, and Ji-Rong Wen. Pre-trained Language Models for Text Generation: A Survey. In *ACM Computing Surveys*, Pages 1-39, Volume 56, Issue 9, April 2024. (**Impact Factor: 28.0**).
- 2023 Wayne Xin Zhao, Kun Zhou<sup>†</sup>, **Junyi Li<sup>†</sup>**, Tianyi Tang, Xiaolei Wang, Yupeng Hou, Yingqian Min, Beichen Zhang, Junjie Zhang, Zican Dong, Yifan Du, Chen Yang, et. al. A Survey of Large Language Models. In *ArXiv*, Volume abs/2303.18223, 2023. (**Citation: 7580**).

### In Conference Proceedings

- 2025 **Junyi Li**, Hwee Tou Ng. Reasoning Models Hallucinate More: Factuality-Aware Reinforcement Learning for Large Reasoning Models. In *The Thirty-Ninth Annual Conference on Neural Information Processing Systems (NeurIPS)*, 2025.
- 2025 Xiaoxue Cheng<sup>†</sup>, **Junyi Li<sup>†</sup>**, Zhenduo Zhang, Xinyu Tang, Wayne Xin Zhao\*, Xinyu Kong, Zhiqiang Zhang. Incentivizing Dual Process Thinking for Efficient Large Language Model Reasoning. In *The Thirty-Ninth Annual Conference on Neural Information Processing Systems (NeurIPS)*, 2025.
- 2025 Lisheng Huang<sup>†</sup>, Yichen Liu<sup>†</sup>, Jinhao Jiang<sup>†</sup>, Rongxiang Zhang, Jiahao Yan, **Junyi Li\***, Wayne Xin Zhao\*. ManuSearch: Democratizing Deep Search in Large Language Models with a Transparent and Open Multi-Agent Framework. In *Findings of The 2025 Conference on Empirical Methods in Natural Language Processing (EMNLP)*, 2025.
- 2025 **Junyi Li**, Hwee Tou Ng. Think&Cite: Improving Attributed Text Generation with Self-Guided Tree Search and Progress Reward Modeling. In *The 63rd Annual Meeting of the Association for Computational Linguistics (ACL)*, 2025.
- 2025 Zican Dong<sup>†</sup>, **Junyi Li<sup>†</sup>**, Jinhao Jiang, Mingyu Xu, Wayne Xin Zhao\*, Bingning Wang, Weipeng Chen. LongReD: Mitigating Short-Text Degradation of Long-Context Large Language Models via Restoration Distillation. In *The 63rd Annual Meeting of the Association for Computational Linguistics (ACL)*, 2025.
- 2025 Xiaoxue Cheng<sup>†</sup>, **Junyi Li<sup>†</sup>**, Wayne Xin Zhao\*, Ji-Rong Wen. Think More, Hallucinate Less: Mitigating Hallucinations via Dual Process of Fast and Slow Thinking. In *Findings of The 63rd Annual Meeting of the Association for Computational Linguistics (ACL)*, 2025.
- 2025 Muhammad Reza Qorib, **Junyi Li**, Hwee Tou Ng. Just Go Parallel: Improving the Multilingual Capabilities of Large Language Models. In *The 63rd Annual Meeting of the Association for Computational Linguistics (ACL)*, 2025.
- 2025 Qian Lin, **Junyi Li**, Hwee Tou Ng. DynaQuest: A Dynamic Question Answering Dataset Reflecting Real-World Knowledge Updates. In *Findings of The 63rd Annual Meeting of the Association for Computational Linguistics (ACL)*, 2025.
- 2025 Xiaolei Wang, Chunxuan Xia, **Junyi Li**, Fanzhe Meng, Lei Huang, Jinpeng Wang, Wayne Xin Zhao\*, Ji-Rong Wen. Search-Based Interaction For Conversation Recommendation via Generative Reward Model Based Simulated User. In *The 48th International ACM SIGIR Conference on Research and Development in Information Retrieval (SIGIR)*, 2025.

- 2025 Ruiyang Ren<sup>†</sup>, Yuhao Wang<sup>†</sup>, **Junyi Li<sup>†</sup>**, Jinhao Jiang, Wayne Xin Zhao\*, Wenjie Wang, Tat-Seng Chua. Holistically Guided Monte Carlo Tree Search for Intricate Information Seeking. In *The 48th International ACM SIGIR Conference on Research and Development in Information Retrieval (SIGIR)*, 2025.
- 2025 Jinhao Jiang<sup>†</sup>, **Junyi Li<sup>†</sup>**, Wayne Xin Zhao\*, Yang Song, Tao Zhang, Ji-Rong Wen. Mix-CPT: A Domain Adaptation Framework via Decoupling Knowledge Learning and Format Alignment. In *The Thirteenth International Conference on Learning Representations (ICLR)*, 2025.
- 2025 Xiaolei Wang, Xinyu Tang, **Junyi Li**, Wayne Xin Zhao\*, Ji-Rong Wen. Investigating the Pre-Training Dynamics of In-Context Learning: Task Recognition vs. Task Learning. In *The Thirteenth International Conference on Learning Representations (ICLR)*, 2025.
- 2025 Jinhao Jiang<sup>†</sup>, Jiayi Chen<sup>†</sup>, **Junyi Li<sup>†</sup>**, Ruiyang Ren, Shijie Wang, Wayne Xin Zhao\*, Yang Song, Tao Zhang. RAG-Star: Enhancing Deliberative Reasoning with Retrieval Augmented Verification and Refinement. In *The Annual Conference of the Nations of the Americas Chapter of the Association for Computational Linguistics (NAACL)*, 2025.
- 2024 Zican Dong<sup>†</sup>, **Junyi Li<sup>†</sup>**, Xin Men, Wayne Xin Zhao\*, Bingning Wang, Zhen Tian, Weipeng Chen, Ji-Rong Wen. Exploring Context Window of Large Language Models via Decomposed Positional Vectors. In *The Thirty-Eighth Annual Conference on Neural Information Processing Systems (NeurIPS)*, 2024.
- 2024 Xiaoxue Cheng<sup>†</sup>, **Junyi Li<sup>†</sup>**, Wayne Xin Zhao\*, Hongzhi Zhang, Fuzheng Zhang, Di Zhang, Kun Gai, Ji-Rong Wen. Small Agent Can Also Rock! Empowering Small Language Models as Hallucination Detector. In *The 2024 Conference on Empirical Methods in Natural Language Processing (EMNLP)*, 2024.
- 2024 Yuhao Wang, Ruiyang Ren, **Junyi Li**, Wayne Xin Zhao\*, Jing Liu, Ji-Rong Wen. REAR: A Relevance-Aware Retrieval-Augmented Framework for Open-Domain Question Answering. In *The 2024 Conference on Empirical Methods in Natural Language Processing (EMNLP)*, 2024.
- 2024 **Junyi Li**, Jie Chen, Ruiyang Ren, Xiaoxue Cheng, Wayne Xin Zhao\*, Jian-Yun Nie, Ji-Rong Wen. The Dawn After the Dark: An Empirical Study on Factuality Hallucination in Large Language Models. In *The 62nd Annual Meeting of the Association for Computational Linguistics (ACL)*, 2024.
- 2024 Xiaoxue Cheng, **Junyi Li**, Wayne Xin Zhao\*, Ji-Rong Wen. ChainLM: Empowering Large Language Models with Improved Chain-of-Thought Prompting. In *The 2024 Joint International Conference on Computational Linguistics, Language Resources and Evaluation (COLING)*, 2024.
- 2024 Zican Dong, Tianyi Tang, **Junyi Li**, Wayne Xin Zhao\*, Ji-Rong Wen. BAMBOO: A Comprehensive Benchmark for Evaluating Long Text Modeling Capacities of Large Language Models. In *The 2024 Joint International Conference on Computational Linguistics, Language Resources and Evaluation (COLING)*, 2024.
- 2023 **Junyi Li<sup>†</sup>**, Xiaoxue Cheng<sup>†</sup>, Wayne Xin Zhao\*, Jian-Yun Nie, Ji-Rong Wen. HaluEval: A Large-Scale Hallucination Evaluation Benchmark for Large Language Models. In *The 2023 Conference on Empirical Methods in Natural Language Processing (EMNLP)*, 2023.
- 2023 Tianyi Tang, Yushuo Chen, Yifan Du, **Junyi Li**, Wayne Xin Zhao\*, Ji-Rong Wen. Learning to Imagine: Visually-Augmented Natural Language Generation. In *The 61st Annual Meeting of the Association for Computational Linguistics (ACL)*, 2023.
- 2023 Tianyi Tang, **Junyi Li**, Wayne Xin Zhao\*, Ji-Rong Wen. MVP: Multi-task Supervised Pre-training for Natural Language Generation. In *Findings of The 61st Annual Meeting of the Association for Computational Linguistics (ACL)*, 2023.
- 2023 Yifan Du, **Junyi Li**, Tianyi Tang, Wayne Xin Zhao\*, Ji-Rong Wen. Zero-shot Visual Question Answering with Language Model Feedback. In *Findings of The 61st Annual Meeting of the Association for Computational Linguistics (ACL)*, 2023.

- 2023 **Junyi Li**, Tianyi Tang, Wayne Xin Zhao\*, Jingyuan Wang, Jian-Yun Nie, Ji-Rong Wen. The Web Can Be Your Oyster for Improving Language Models. In *Findings of The 61st Annual Meeting of the Association for Computational Linguistics (ACL)*, 2023.
- 2022 **Junyi Li**, Tianyi Tang, Wayne Xin Zhao\*, Jian-Yun Nie, Ji-Rong Wen. ELMER: A Non-Autoregressive Pre-trained Language Model for Efficient and Effective Text Generation. In *The 2022 Conference on Empirical Methods in Natural Language Processing (EMNLP)*, 2022.
- 2022 Tianyi Tang<sup>†</sup>, **Junyi Li**<sup>†</sup>, Zhipeng Chen<sup>†</sup>, Yiwen Hu, Zhuohao Yu, Wenxun Dai, Wayne Xin Zhao\*, Jian-Yun Nie, Ji-Rong Wen. TextBox 2.0: A Text Generation Library with Pre-trained Language Models. In *The 2022 Conference on Empirical Methods in Natural Language Processing (EMNLP)*, 2022.
- 2022 Tianyi Tang, **Junyi Li**, Wayne Xin Zhao\*, Ji-Rong Wen. Context-Tuning: Learning Contextualized Prompts for Natural Language Generation. In *The 29th International Conference on Computational Linguistics (COLING)*, 2022.
- 2022 Yifan Du, Zikang Liu, **Junyi Li**, Wayne Xin Zhao\*. A Survey of Vision-Language Pre-Trained Models. In *The 31th International Joint Conference on Artificial Intelligence (IJCAI)*, 2022.
- 2022 **Junyi Li**, Tianyi Tang, Zheng Gong, Lixin Yang, Zhuohao Yu, Zhipeng Chen, Jingyuan Wang, Wayne Xin Zhao\*, Ji-Rong Wen. ElitePLM: An Empirical Study on General Language Ability Evaluation of Pretrained Language Models. In *The North American Chapter of the Association for Computational Linguistics (NAACL)*, 2022.
- 2022 **Junyi Li**, Tianyi Tang, Jian-Yun Nie, Ji-Rong Wen, Wayne Xin Zhao\*. Learning to Transfer Prompts for Text Generation. In *The North American Chapter of the Association for Computational Linguistics (NAACL)*, 2022.
- 2021 **Junyi Li**<sup>†</sup>, Tianyi Tang<sup>†</sup>, Gaole He, Jinhao Jiang, Xiaoxuan Hu, Puzhao Xie, Zhipeng Chen, Zhuohao Yu, Wayne Xin Zhao\*, Ji-Rong Wen. TextBox: A Unified, Modularized, and Extensible Framework for Text Generation. In *The 59th Annual Meeting of the Association for Computational Linguistics (ACL)*, 2021.
- 2021 **Junyi Li**, Tianyi Tang, Wayne Xin Zhao\*, Ji-Rong Wen. Few-shot Knowledge Graph-to-Text Generation with Pretrained Language Models. In *Findings of The 59th Annual Meeting of the Association for Computational Linguistics (ACL)*, 2021.
- 2021 **Junyi Li**, Tianyi Tang, Wayne Xin Zhao\*, Ji-Rong Wen. Pretrained Language Model for Text Generation: A Survey. In *The 30th International Joint Conference on Artificial Intelligence (IJCAI)*, 2021.
- 2021 **Junyi Li**, Wayne Xin Zhao\*, Zhicheng Wei, Nicholas Jing Yuan, Ji-Rong Wen. Knowledge-based Review Generation by Coherence Enhanced Text Planning. In *The 44th International ACM SIGIR Conference on Research and Development in Information Retrieval (SIGIR)*, 2021.
- 2020 **Junyi Li**, Siqing Li, Wayne Xin Zhao\*, Gaole He, Zhicheng Wei, Nicholas Jing Yuan, Ji-Rong Wen. Knowledge-Enhanced Personalized Review Generation with Capsule Graph Neural Network. In *The 29th ACM International Conference on Information and Knowledge Management (CIKM)*, 2020.
- 2020 Gaole He, **Junyi Li**, Wayne Xin Zhao\*, Peiju Liu, Ji-Rong Wen. Mining Implicit Entity Preference from User-Item Interaction Data for Knowledge Graph Completion via Adversarial Learning. In *International World Wide Web Conference (WWW)*, 2020.
- 2019 **Junyi Li**, Wayne Xin Zhao\*, Ji-Rong Wen, Yang Song. Generating Long and Informative Reviews with Aspect-Aware Coarse-to-Fine Decoding. In *Proceedings of the 57th Annual Meeting of the Association for Computational Linguistics (ACL)*, 2019.

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## Fellowships & Awards

- 2025 **Huawei Hong Kong-CityU Funding**, as a postdoc researcher in City University of Hong Kong.

- 2024 *Outstanding Doctoral Dissertation* (1/10 per year in China), awarded by Chinese Information Processing Society of China.
- 2024 *Outstanding Graduates*, awarded by Renmin University of China.
- 2023 *Baidu Scholarship* (Top 40 in global), awarded by Baidu.
- 2023 *Jingdong Special Scholarship* (1/20 per year), awarded by Renmin University of China.
- 2021 *National Scholarship* (20% doctoral students), awarded by Ministry of Education of China.
- 2021 *SIGIR Student Travel Grant*, awarded by CIKM 2021.
- 2019 *National Scholarship* (20% master students), awarded by Ministry of Education of China.

## Academic Achievements & Recognitions

Reviewer Journal: TALLIP, TKDD, ACM Computing Survey, Computational Intelligence.  
Conference: AAAI, IJCAI, ACL, EMNLP, COLING, NeurIPS, ICLR.

Chair ACL ARR.

## Position of Responsibility

- 2020-2023 **Student Executive Committee Member of Youth Work Committee**, CIPS.
- Dec, 2020 **Organizer and Session Chair**, The China Student Symposium on Natural Language Processing (CSSNLP), Beijing, China.

## Teaching Assistantship

- Fall, 2019 **Advanced Operating Systems**, lectured by Qing Zhu, Renmin University of China.
- Fall, 2021 **Python programming**, lectured by Na Ta, Renmin University of China.
- Spring, 2022– **Information Technology Fundamentals**, lectured by Xiang Ye, Renmin University of China.
- Spring, 2024