

# Hangfeng He

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## Research Interests

My research interests include natural language processing and machine learning, with a focus on interpreting deep learning models, leveraging indirect signals, and advancing reasoning in large language models.

## Academic Positions

**University of Rochester**, Rochester, NY, USA      2022-present  
Assistant Professor in Computer Science and Data Science

## **Education**

<b>University of Pennsylvania</b> , Philadelphia, PA, USA	2017-2023
Ph.D. in Computer and Information Science	
Advisors: Dan Roth and Weijie Su	
<b>Peking University</b> , Beijing, China	2013-2017
B.S. in Computer Science, <i>Summa Cum Laude</i>	

## Publications

1. Adiba Proma, Neeley Pate, James Druckman, Gourab Ghoshal, **Hangfeng He**, and Ehsan Hoque. 2025. "How LLMs Fail to Support Fact-Checking." In 2025

*IDeaS Conference on Online Harms, Hate Speech, and Extremism Online (to appear)*, 7 pages.

2. Huanxin Sheng, Xinyi Liu, **Hangfeng He**, Jieyu Zhao, and Jian Kang. 2025. “Analyzing Uncertainty of LLM-as-a-Judge: Interval Evaluations with Conformal Prediction.” In *Proceedings of the 2025 Conference on Empirical Methods in Natural Language Processing (SAC Highlights)*, pp. 11297–11339.
3. Xinyi Liu, Weiguang Wang, and **Hangfeng He**. 2025. “The Role of Model Confidence on Bias Effects in Measured Uncertainties.” In *Findings of the Association for Computational Linguistics: EMNLP 2025*, pp. 20297–20313.
4. Boyi Zhang, Zhusuo Liu, and **Hangfeng He**. 2025. “TreeRare: Syntax Tree-Guided Retrieval and Reasoning for Knowledge-Intensive Question Answering.” In *Proceedings of the 2025 Conference on Empirical Methods in Natural Language Processing*, pp. 18752–18773.
5. Zhusuo Liu, Ding Yu, and **Hangfeng He**. 2025. “On the Role of Model Prior in Real-World Inductive Reasoning.” In *Proceedings of the 2025 Conference on Empirical Methods in Natural Language Processing*, pp. 10571–10594.
6. **Hangfeng He** and Weijie Su. 2025. “A Law of Next-Token Prediction in Large Language Models.” In *Physical Review E*, 11 pages.
7. Ding Yu, Zhusuo Liu, and **Hangfeng He**. “Same Company, Same Signal: The Role of Identity in Earnings Call Transcripts.” In *Findings of the Association for Computational Linguistics: ACL 2025*, pp. 18403-18422.
8. Jiarui Wu, Zhusuo Liu, and **Hangfeng He**. 2025. “Mitigating Hallucinations in Multimodal Spatial Relations through Constraint-Aware Prompting.” In *Findings of the Association for Computational Linguistics: NAACL 2025*, pp. 3450-3468.
9. Xinyi Liu, Pinxin Liu, and **Hangfeng He**. 2024. “An Empirical Analysis on Large Language Models in Debate Evaluation.” In *Proceedings of the 62nd Annual Meeting of the Association for Computational Linguistics (Volume 2: Short Papers)*, pp. 470–487.

10. **Hangfeng He**, Hongming Zhang, and Dan Roth. 2024. “SocREval: Large Language Models with the Socratic Method for Reference-Free Reasoning Evaluation.” In *Findings of the Association for Computational Linguistics: NAACL 2024*, pp. 2736–2764.
11. Sindhu Kishore and **Hangfeng He**. 2024. “Unveiling Divergent Inductive Biases of LLMs on Temporal Data.” In *Proceedings of the 2024 Conference of the North American Chapter of the Association for Computational Linguistics: Human Language Technologies (Volume 2: Short Papers)*, pp. 220–228.
12. Matteo Sordello, Niccolo Dalmasso, **Hangfeng He**, and Weijie Su. 2024. “Robust Learning Rate Selection for Stochastic Optimization via Splitting Diagnostic.” *Transactions on Machine Learning Research*, 18 pages.
13. **Hangfeng He** and Weijie Su. 2023. “A Law of Data Separation in Deep Learning.” *Proceedings of the National Academy of Sciences* 120 (36): e2221704120. *Direct Submission*.
14. Kaifu Wang, **Hangfeng He**, Tin Nguyen, Piyush Kumar, and Dan Roth. 2023. “On Regularization and Inference with Label Constraints.” In *Proceedings of the 40th International Conference on Machine Learning*, vol. 202, *Proceedings of Machine Learning Research*, pp. 35740–35762.
15. Mohammad Rostami, **Hangfeng He**, Muhao Chen, and Dan Roth. 2022. “Transfer Learning via Representation Learning.” In *Federated and Transfer Learning*, pp. 233–257.
16. Shuxiao Chen, Koby Crammer, **Hangfeng He**, Dan Roth, and Weijie Su (**alphabetical order**). 2022. “Weighted Training for Cross-Task Learning.” In *International Conference on Learning Representations*, 12 pages. *Oral presentation*.
17. Cong Fang, **Hangfeng He**, Qi Long, and Weijie Su (**alphabetical order**). 2021. “Exploring Deep Neural Networks via Layer-Peeled Model: Minority Collapse in Imbalanced Training.” *Proceedings of the National Academy of Sciences* 118 (43): e2103091118. *Direct Submission*.

18. **Hangfeng He**, Mingyuan Zhang, Qiang Ning, and Dan Roth. 2021. “Foreseeing the Benefits of Incidental Supervision.” In *Proceedings of the 2021 Conference on Empirical Methods in Natural Language Processing*, pp. 1782–1800.
19. Zhun Deng, **Hangfeng He**, and Weijie Su. 2021. “Toward Better Generalization Bounds with Locally Elastic Stability.” In *Proceedings of the 38th International Conference on Machine Learning*, vol. 139, Proceedings of Machine Learning Research, pp. 2590–2600.
20. Ayal Klein, Jonathan Mamou, Valentina Pyatkin, Daniela Stepanov, **Hangfeng He**, Dan Roth, Luke Zettlemoyer, and Ido Dagan. 2020. “QANom: Question-Answer Driven SRL for Nominalizations.” In *Proceedings of the 28th International Conference on Computational Linguistics*, pp. 3069–3083.
21. Shuxiao Chen, **Hangfeng He**, and Weijie Su (**alphabetical order**). 2020. “Label-Aware Neural Tangent Kernel: Toward Better Generalization and Local Elasticity.” In *Advances in Neural Information Processing Systems*, vol. 33, pp. 15847–15858.
22. Zhun Deng, **Hangfeng He**, Jiaoyang Huang, and Weijie Su. 2020. “Towards Understanding the Dynamics of the First-Order Adversaries.” In *Proceedings of the 37th International Conference on Machine Learning*, vol. 119, Proceedings of Machine Learning Research, pp. 2484–2493.
23. **Hangfeng He**, Qiang Ning, and Dan Roth. 2020. “QuASE: Question-Answer Driven Sentence Encoding.” In *Proceedings of the 58th Annual Meeting of the Association for Computational Linguistics*, pp. 8743–8758.
24. Soham Dan, **Hangfeng He**, and Dan Roth. 2020. “Understanding Spatial Relations through Multiple Modalities.” In *Proceedings of the Twelfth Language Resources and Evaluation Conference*, pp. 2368–2372.
25. **Hangfeng He** and Weijie Su. 2020. “The Local Elasticity of Neural Networks.” In *International Conference on Learning Representations*, 13 pages.
26. Qiang Ning, **Hangfeng He**, Chuchu Fan, and Dan Roth. 2019. “Partial or Complete, That’s the Question.” In *Proceedings of the 2019 Conference of the*

*North American Chapter of the Association for Computational Linguistics: Human Language Technologies, Volume 1 (Long and Short Papers)*, pp. 2190–2200.

27. Jingjing Xu, **Hangfeng He**, Xu Sun, Xuancheng Ren, and Sujian Li. 2018. “Cross-Domain and Semi-Supervised Named Entity Recognition in Chinese Social Media: A Unified Model.” *IEEE/ACM Transactions on Audio, Speech, and Language Processing* 26 (11): 2142–2152.
28. Federico Fancellu, Adam Lopez, Bonnie Webber, and **Hangfeng He**. 2017. “Detecting Negation Scope Is Easy, Except When It Isn’t.” In *Proceedings of the 15th Conference of the European Chapter of the Association for Computational Linguistics: Volume 2, Short Papers*, pp. 58–63.
29. **Hangfeng He** and Xu Sun. 2017. “F-Score Driven Max Margin Neural Network for Named Entity Recognition in Chinese Social Media.” In *Proceedings of the 15th Conference of the European Chapter of the Association for Computational Linguistics: Volume 2, Short Papers*, pp. 713–718.
30. **Hangfeng He** and Xu Sun. 2017. “A Unified Model for Cross-Domain and Semi-Supervised Named Entity Recognition in Chinese Social Media.” In *Proceedings of the AAAI Conference on Artificial Intelligence*, vol. 31, no. 1. pp. 3216–3222.
31. **Hangfeng He**, Federico Fancellu, and Bonnie Webber. 2017. “Neural Networks for Negation Cue Detection in Chinese.” In *Proceedings of the Workshop Computational Semantics Beyond Events and Roles*, pp. 59–63.

## Preprints

1. Hang Hua, Yunlong Tang, Ziyun Zeng, Liangliang Cao, Zhengyuan Yang, **Hangfeng He**, Chenliang Xu, and Jiebo Luo. 2024. “MMCOMPOSITION: Revisiting the Compositionality of Pre-Trained Vision-Language Models.” *arXiv:2410.09733 [cs.CV]*, 16 pages.
2. **Hangfeng He**, Hongming Zhang, and Dan Roth. 2023. “Rethinking with Retrieval: Faithful Large Language Model Inference.” *arXiv:2301.00303 [cs.CL]*,

12 pages.

## **Teaching**

### **CSC 511: Large Language Models**

Fall 2024, Fall 2025

### **CSC 247/447: Natural Language Processing**

Spring 2023, Fall 2023, Spring 2025

### **CSC 442: Artificial Intelligence**

Fall 2022

## **Professional Service**

### **NSF/CRA Service**

Mentor for CSGRAD4US Graduate Fellowship Program (2025)

### **Grant Reviewer**

Reviewer for SNSF Spark funding proposals (2024-2025)

### **Workshop Organizations**

Co-organizer for Trustworthy Foundation Models Workshop (2025)

### **Area Chair**

ARR (2025), EMNLP (2025), IJCNLP-AACL (2023, 2025)

### **Senior Program Committee Member**

AAAI (2023)

### **Program Committee Member**

ACL (2020-2021), COLING (2025), EMNLP (2019), NAACL (2019)

### **Conference Reviewer**

ARR (2021, 2024, 2025), ICLR (2024), ICML (2021, 2023),  
NeurIPS (2020)

### **Journal Reviewer**

IEEE TNNLS (2018-2020), TACL (2023)

## University Service

<b>AI BS and PhD Programs Committee</b>	2024-present
<b>Data Science Working Group Co-Chair</b>	2023-present
<b>Center for Language Science Faculty Advisory Committee</b>	2025-present
<b>Data Science M.S. Admission Committee</b>	2022-present
<b>Computer Science Graduate Education Committee</b>	2024-2026
<b>Computer Science Faculty Search Committee</b>	2024-2025
<b>Computer Science Undergraduate Education Committee</b>	2023-2024
<b>Annual URCS Newsletter Committee</b>	2023-2024
<b>Computer Science Ph.D. Admission Committee</b>	2022-2023
<b>Data Science Faculty Search Committee</b>	2022-2023

## Invited Talks

### **Rethinking LLM Behaviors: From Uncertainty and Priors to Financial Applications**

Invited Talk at UR CLS Language Science Lecture Series

### **A Law of Data Separation in Deep Learning**

Invited Session Talk at JSM, August, 2023

Invited Session Talk at ICSA, June, 2023

### **Moving Beyond Scale-Driven Learning**

Invited Talk at UR GIDS, October, 2022

### **Local Elasticity: A Phenomenological Approach Toward Understanding Deep Learning**

Invited Talk at uOttawa TML seminar, November, 2021

**Incidental Supervision for Natural Language Understanding**

Invited Talk at USC/ISI AI Seminar, October, 2021