

# Hangfeng He

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## Research Interests

My research interests include natural language processing and machine learning, with a focus on incidental supervision for natural language understanding, geometrization of deep neural networks, and reasoning in natural language.

## Academic Positions

<b>University of Rochester</b> , 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	

## Publications

1. Kaifu Wang, **Hangfeng He**, Tin Nguyen, Piyush Kumar, and Dan Roth. 2023. On Regularization and Inference with Label Constraints. In *International Conference on Machine Learning (ICML)*.

2. Mohammad Rostami, **Hangfeng He**, Muhao Chen, and Dan Roth. 2023. Transfer Learning via Representation Learning. In *Federated and Transfer Learning. Book Chapter*.
3. 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 (ICLR)*. Oral presentation.
4. 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. In *Proceedings of the National Academy of Sciences (PNAS)*. Direct submission.
5. **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 (EMNLP)*.
6. Zhun Deng, **Hangfeng He**, and Weijie Su. 2021. Toward Better Generalization Bounds With Locally Elastic Stability. In *International Conference on Machine Learning (ICML)*.
7. Ayal Klein, Jonathan Mamou, Valentina Pyatkin, Daniela Brook Weiss, **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 (COLING)*.
8. 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 (NeurIPS)*.
9. Zhun Deng, **Hangfeng He**, Jiaoyang Huang, and Weijie Su. 2020. Towards Understanding the Dynamics of the First-Order Adversaries. In *International Conference on Machine Learning (ICML)*.
10. **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 (ACL)*.

11. Soham Dan, **Hangfeng He**, and Dan Roth. 2020. Understanding Spatial Relations through Multiple Modalities. In *Proceedings of the 12th Language Resources and Evaluation Conference (LREC). Short papers*.
12. **Hangfeng He** and Weijie Su. 2020. The Local Elasticity of Neural Networks. In *International Conference on Learning Representations (ICLR)*.
13. 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 (NAACL-HLT)*.
14. Jingjing Xu, **Hangfeng He**, Xu Sun, Xuancheng Ren, and Sujian Li. 2018. Cross-domain and semisupervised named entity recognition in chinese social media: A unified model. In *IEEE/ACM Transactions on Audio, Speech, and Language Processing (TASLP)*.
15. 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 (EACL). Short papers*.
16. **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 (EACL). Short papers*.
17. **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 (AAAI)*.
18. **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 (SemBEaR)*.

## Preprints

1. **Hangfeng He**, Hongming Zhang, and Dan Roth. 2023. Rethinking with Retrieval: Faithful Large Language Model Inference. In *arXiv preprint*.
2. **Hangfeng He** and Weijie Su. 2022. A Law of Data Separation in Deep Learning. In *arXiv preprint*.
3. Matteo Sordello, **Hangfeng He**, and Weijie Su. 2019. Robust Learning Rate Selection for Stochastic Optimization via Splitting Diagnostic. In *arXiv preprint*.

## Teaching

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

Spring 2023

**CSC 442: Artificial Intelligence**

Fall 2022

## Professional Service

**Senior Program Committee Member**

AAAI (2023)

**Program Committee Member**

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

**Conference Reviewer**

ACL Rolling Review (2021), ICML (2021, 2023), NeurIPS (2020)

## Invited Talks

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

Invited Session Talk at JSM, August, 2023 (Incoming)

Invited Session Talk at ICSA, June, 2023 (Incoming)

### **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