Jingcheng (Frank) Niu frankniujc@gmail.com — https://frankniujc.github.io/

RESEARCH INTERESTS

Computational linguistics, natural language processing and machine learning: mechanistic interpretability, language modelling, temporal information extraction.

EDUCATION

University of Toronto, Ph.D. in Computer Science. 2020 — 2025
Advisor: Gerald Penn.
Thesis: Towards the Renormalization of Transformer Language Models.
Committee: Gerald Penn, Frank Rudzicz, David Duvenaud, Ewan Dunbar, Cynthia Rudin.

University of Toronto, Master of Science in Computer Science. 2018 — 2020
Advisor: Gerald Penn.

University of Toronto, Bachelor of Science in Computer Science. 2014 — 2020

ACADEMIC EXPERIENCE

Ubiquitous Knowledge Processing (UKP) Lab, TU Darmstadt. 2025 — Present
Postdoctoral Researcher. Darmstadt, Germany
Advisor: Iryna Gurevych.

INDUSTRY EXPERIENCE

Microsoft Research 2024 Summer
Research Scientist Intern Montreal, Canada

Public Health Agency of Canada 2020 — 2024
Research Scientist Toronto, Canada

Vector Institute 2023 — 2024
Faculty Affiliate Researcher Toronto, Canada

iNAGO Corporation 2017 — 2018
Research Intern Toronto, Canada

IBM Canada 2017
Software Engineering Intern Markham, Canada

HONOURS AND AWARDS

- Outstanding Paper Award, ACL 2025. 2025
- Federal Student Work Experience Program (FSWEP). 2020 — 2024
- Vector Research Faculty Affiliate Award. 2023
- Ph.D. Conference Travel Award. 2022
- Vector Postgraduate Affiliate Award. 2021, 2022
- St. Michael's College Silver Medal. 2018
- Dean's List — University of Toronto. 2014 — 2017

TEACHING EXPERIENCE

Instructor at the University of Toronto.

- CSC485/2501 Introduction to Computational Linguistics. Fall 2024

*Last updated: September, 2025.

Instructor at the TU Darmstadt.

- Introduction to Large Language Models. Winter 2025

Head Teaching Assistant at the University of Toronto.

- CSC401/2511 Natural Language Computing. Winter 2024
- CSC485/2501 Introduction to Computational Linguistics. Fall 2023

Teaching Assistant at the University of Toronto.

- CSC485/2501 Introduction to Computational Linguistics. Fall 2019, 2020, 2021, 2022
- CSC401/2511 Natural Language Computing. Winter 2021, 2022, 2023
- CSC263: Data Structures and Analysis. Winter 2017, 2018, 2019, 2020
- CSC236: Introduction to the Theory of Computation. Fall 2015, Summer 2021
- CSC148: Introduction to Computer Science. Fall 2018, Summer 2019

PUBLICATIONS

Refereed Conference Publications

*: Equal contribution.

1. Dynamic Granularity in the Wild: Differentiable Sheaf Discovery with Joint Computation Graph Pruning.
   Lei Yu*, **Jingcheng Niu***, Zining Zhu, Xi Chen, Gerald Penn.
   In *Proceedings of the Conference on Empirical Methods in Natural Language Processing* (**EMNLP**), 2025.

2. Tiny Budgets, Big Gains: Parameter Placement Strategy in Parameter Super-Efficient Fine-Tuning.
   Jinman Zhao, Xueyan Zhang, Jiaru Li, **Jingcheng Niu**, Yulan Hu, Erxue Min, Gerald Penn.
   In *Proceedings of the Conference on Empirical Methods in Natural Language Processing* (**EMNLP**), 2025.

3. Llama See, Llama Do: A Mechanistic Perspective on Contextual Entrainment and Distraction in LLMs.
   Jingcheng Niu, Xingdi Yuan, Tong Wang, Hamidreza Saghir, Amir H. Abdi.
   In *Proceedings of the Annual Conference of the Association for Computational Linguistics* (**ACL**), 2025, (Outstanding Paper Award).

4. Attenuating Catastrophic Forgetting of Token-Level Knowledge in Contrastive Sentence Embeddings with Attentive Pooling.
   Saifei Liao, **Jingcheng Niu**, Gerald Penn.
   In *Proceedings of the 38th Canadian Conference on Artificial Intelligence* (**CAIAC**), 2025.

5. ConTempo: Temporally Contrastive Learning for Temporal Relation Extraction.
   Jingcheng Niu, Saifei Liao, Victoria Ng, Simon de Montigny, Gerald Penn.
   In *Findings of the Association for Computational Linguistics* (**ACL Findings**), 2024.

6. What does the Knowledge Neuron Thesis Have to do with Knowledge?
   Jingcheng Niu, Andrew Liu, Zining Zhu, Gerald Penn.
   In *International Conference on Learning Representations* (**ICLR**), 2024, (Spotlight).

7. Chinese Quantifier Scope, Concord, and Lexical Resource Semantics.
   Jingcheng Niu, Xinyu Kang, Pascal Hohmann, Gerald Penn.
   In *International Conference on Head-Driven Phrase Structure Grammar* (**HPSG**), 2022.

8. Does BERT Rediscover a Classical NLP Pipeline?.
   Jingcheng Niu, Wenjie Lu, Gerald Penn.
   In *Proceedings of the International Conference on Computational Linguistics* (**COLING**), 2022, (Oral).

9. Temporal Histories of Epidemic Events (THEE): A Case Study in Temporal Annotation for Public Health.
   Jingcheng Niu, Erin E. Rees, Victoria Ng, Gerald Penn.
   In Proceedings of the Language Resources and Evaluation Conference (**LREC**), 2020.

10. Rationally Reappraising ATIS-based Dialogue Systems.
Jingcheng Niu, Gerald Penn.
In *Proceedings of the 57th Annual Meeting of the Association for Computational Linguistics* (**ACL**), 2019.

Journal Publications

11. Illusion or Algorithm? Investigating Memorization, Emergence, and Symbolic Processing in In-Context Learning.
Jingcheng Niu, Subhabrata Dutta, Ahmed Elshabrawy, Harish Tayyar Madabushi, Iryna Gurevych.
Transactions on Machine Learning Research, (**TMLR**), 2022..

12. A call for an ethical framework when using social media data for artificial intelligence applications in public health research.
Jean-Philippe Gilbert, Victoria Ng, **Jingcheng Niu**, Erin E. Rees.
Canada Communicable Disease Report, (**CCDR**), 2020.

13. Application of natural language processing algorithms for extracting information from news articles in event-based surveillance.
Victoria Ng, Erin E Rees, **Jingcheng Niu**, Abdelhamid Zaghool, Homeira Ghiasbeglou, Adrian Verster.
Canada Communicable Disease Report, (**CCDR**), 2020.

Refereed Workshop Publications

14. Discourse Information for Document-Level Temporal Dependency Parsing.
Jingcheng Niu, Victoria Ng, Erin E. Rees, Simon de Montigny, Gerald Penn.
In *Proceedings of the Workshop on Computational Approaches to Discourse* (**CODI**), 2023.

15. Using Roark-Hollingshead Distance to Probe BERT's Syntactic Competence.
Jingcheng Niu, Wenjie Lu, Eric Corlett, Gerald Penn.
In *Proceedings of the BlackboxNLP Workshop on Analyzing and Interpreting Neural Networks for NLP* (**BlackboxNLP**), 2022.

16. Statistically Evaluating Social Media Sentiment Trends towards COVID-19 Non-Pharmaceutical Interventions with Event Studies.
Jingcheng Niu, Erin E. Rees, Victoria Ng, Gerald Penn.
In *Proceedings of the Sixth Social Media Mining for Health Workshop and Shared Task* (**SMM4H**), 2021.

17. Machine Learning Identification of Self-reported COVID-19 Symptoms from Tweets in Canada.
Jean-Philippe Gilbert, **Jingcheng Niu**, Simon de Montigny, Victoria Ng, Erin E. Rees
In *International Workshop on Health Intelligence* (**W3PHAI**), 2021.

18. Grammaticality and Language Modelling.
Jingcheng Niu, Gerald Penn.
In *Proceedings of the Workshop on Evaluation and Comparison of NLP Systems* (**Eval4NLP**), 2020.

Refereed Industry Track Conference Publications

19. Bringing the State-of-the-Art to Customers: A Neural Agent Assistant Framework for Customer Service Support.
Stephen Obadinma, Faiza Khan Khattak, Shirley Wang, Tania Sidhom, Elaine Lau, Sean Robertson, **Jingcheng Niu**, Winnie Au, Alif Munim, Karthik Raja K. Bhaskar, Bencheng Wei, Iris Ren, Waqar Muhammad, Erin Li, Bukola Ishola, Michael Wang, Griffin Tanner, Yu-Jia Shiah, Sean X. Zhang, Kwesi P. Apponsah, Kanishk Patel, Jaswinder Narain, Deval Pandya, Xiaodan Zhu, Frank Rudzicz, Elham Dolatabadi.
In *Proceedings of the 2022 Conference on Empirical Methods in Natural Language Processing: Industry Track* (**EMNLP Industry Track**).

Preprints & Work Under Review

20. Shape Happens: Automatic Feature Manifold Discovery in LLMs.
Federico Tiblias, Irina Bigoulaeva, **Jingcheng Niu**, Simone Balloccu, Iryna Gurevych.
Under Review, 2025.

SERVICE

Reviewer for conferences and workshops: ACL Rolling Review, NeurIPS, EACL, EMNLP, ACL, IJCNLP, Fever Workshop, CODI Workshop, Interplay Workshop.

Emergency Area Chair for conferences: ACL Rolling Review.

INVITED TALKS

1. How LLMs Reason about Time?
   The Workshop of AI-based Methods for the Humanities, BIFOLD Institute. September 2025.
2. Dissecting Language Models: From Black Boxes to Interpretable AI.
   UKP-CIS Joint Invited Talk Series, TU Darmstadt and LMU Munich. July 2024.
3. Dissecting Language Models: From Black Boxes to Interpretable AI.
   Linguistics Colloquium, Goethe-Universität Frankfurt. May 2024.
4. Dissecting Language Models to Understand Their Internal Workings.
   AICamp Toronto. March 2024.
5. Using Roark-Hollingshead Distance to Probe BERT's Syntactic Competence.
   Vector Research Symposium. February 2024.
6. Syntax and Language Modelling
   ACL Student Research Seminar, University of Toronto. July 2023.
7. Does BERT Rediscover the Classical NLP Pipeline?
   Vector Research Symposium. March 2023.
8. Chinese Quantifier Scope, Concord, and Lexical Resource Semantics.
   Linguistics Colloquium, Goethe-Universität Frankfurt. October 2022.
9. Understanding Public Sentiment about COVID-19 Non-Pharmaceutical Interventions through Event Studies.
   Vector Research Symposium. February 2021.

MENTORSHIPS AND SUPERVISION

Ph.D. Student Supervision

- Federico Tiblias, Ph.D. student at the UKP Lab, TU Darmstadt. 2025 — Present
  Joint with Iryna Gurevych.
  Topic: Geometric and causal structure in latent representations.
- Alireza Bayat Makou, Ph.D. student at the UKP Lab, TU Darmstadt. 2025 — Present
  Joint with Subhabrata Dutta and Iryna Gurevych.
  Topic: Circuit discovery.

Master Students

- Ahmed Oumar El-Shangiti, M.Sc. student at MBZUAI. Summer 2025
  Research Intern at the UKP Lab, TU Darmstadt.
  Joint with Benjamin Heinzerling.
  Topic: Geometric and causal structure in latent representations for visual-language models.
- Xiaoyan Xue, M.Sc. student at TU Darmstadt. 2025 — Present
  Master Thesis at the UKP Lab, TU Darmstadt.
  Joint with Hovhannes Tamoyan.
- Tam Truong, M.Sc. student at TU Darmstadt. 2025 — Present
  Master Thesis at the UKP Lab, TU Darmstadt.
  Joint with Hovhannes Tamoyan.
- Wenjie Lu, M.Sc. student at the University of Toronto. 2022 — 2023
  Mentorship and Collaboration at the University of Toronto.

Undergraduate Students

- Jonas Schulz, Undergraduate student at TU Darmstadt. 2025 — Present
  Undergraduate Thesis at the UKP Lab, TU Darmstadt.
  Joint with Hovhannes Tamoyan.
- Andrew Liu, Undergraduate student at the University of Waterloo. 2023 — 2024
  Mentorship and Collaboration at the University of Toronto.
- Saifei Liao, Undergraduate student at the University of Toronto. 2022 — 2023
  Mentorship and Collaboration at the University of Toronto.
- Xi Chen, Undergraduate student at the University of Toronto. 2024 — 2025
  Mentorship and Collaboration at the University of Toronto.