

# Xiaoyin Chen

xiaoyin.chen@mila.quebec | chenyn66.github.io | Google Scholar

## EDUCATION

---

<b>Mila, Université de Montreal</b> <i>Doctor of Philosophy, Computer Science, Advisor: Prof. Yoshua Bengio</i>	Sept. 2023 – Present GPA: 4.00/4.00
<b>Duke University</b> <i>Master of Science, Computer Science, Advisor: Prof. Sam Wiseman</i>	Aug. 2021 – May 2023 GPA: 4.00/4.00
<b>University of California, Irvine</b> <i>Bachelor of Science, Computer Science, Minor in Statistics</i>	Sept. 2016 – Mar. 2020 GPA: 3.94/4.00, Major GPA: 3.99/4.00

## PUBLICATIONS & PREPRINTS

---

### Peer-reviewed conference, journal, and workshop

#### **Aligning Protein Conformation Ensemble Generation with Physical Feedback**

Jiarui Lu\*, Xiaoyin Chen\*, Stephen Zhewen Lu, Aurelie Lozano, Aurelie Lozano, Vijil Chenthamarakshan, Payel Das, Jian Tang.

Forty-Second International Conference on Machine Learning, <https://arxiv.org/abs/2505.24203>, 2025.

#### **Structure Language Models for Protein Conformation Generation**

Jiarui Lu\*, Xiaoyin Chen\*, Stephen Zhewen Lu, Chence Shi, Hongyu Guo, Yoshua Bengio, Jian Tang.

International Conference on Learning Representations 2025, <https://arxiv.org/abs/2410.18403>, 2024.

#### **HarmAug: Effective Data Augmentation for Knowledge Distillation of Safety Guard Models**

Seanie Lee, Haebin Seong, Dong Bok Lee, Minki Kang, Xiaoyin Chen, Dominik Wagner, Yoshua Bengio, Juho Lee, Sung Ju Hwang.

International Conference on Learning Representations 2025, <https://arxiv.org/abs/2410.01524>, 2024.

#### **Proof Flow: Preliminary Study on Generative Flow Network Language Model Tuning for Formal Reasoning**

Matthew Ho, Vincent Zhu, Xiaoyin Chen, Moksh Jain, Nikolay Malkin, Edwin Zhang.

System-2 Reasoning at Scale Workshop at NeurIPS 2024, <https://arxiv.org/abs/2410.13224>, 2024.

#### **Inference and Verbalization Functions During In-Context Learning**

Junyi Tao\*, Xiaoyin Chen\*, Nelson F. Liu.

Findings of Empirical Methods in Natural Language Processing (EMNLP) 2024, <https://arxiv.org/abs/2410.09349>, 2024.

#### **Efficient Causal Graph Discovery Using Large Language Models**

Thomas Jiralerspong\*, Xiaoyin Chen\*, Yash More, Vedant Shah, Yoshua Bengio.

AGI Workshop at ICLR 2024, <https://arxiv.org/abs/2402.01207>, 2024.

#### **Learning Consistent Deep Generative Models from Sparse Data via Prediction Constraints**

Gabriel Hope, Madina Abdrakhmanova, Xiaoyin Chen, Michael C. Hughes, Erik B. Sudderth.

4th Symposium on Advances in Approximate Bayesian Inference, 2022. [arxiv.org/abs/2012.06718](https://arxiv.org/abs/2012.06718).

#### **On the Current Failure – But Bright Future – of Topology-driven Biological Network Alignment**

Siyue Wang, Xiaoyin Chen, Brent J. Frederisy, Benedict A. Mbakogu, Amy D. Kanne, Pasha Khosravi, Wayne B. Hayes.

Advances in Protein Chemistry and Structural Biology: Protein interaction networks, Volume 131.

<https://arxiv.org/abs/2204.11999>.

#### **Cross-species Prediction of Protein Function by Global Network Alignment**

Siyue Wang, Xiaoyin Chen, Brent J. Frederisy, Benedict A. Mbakogu, Amy D. Kanne, Pasha Khosravi, Giles R.S. Atkinson, Wayne B. Hayes.

28th Conference on Intelligent Systems for Molecular Biology (protein prediction track), 2020.

[https://www.iscb.org/cms\\_addon/conferences/ismb2020/tracks/functioncosi](https://www.iscb.org/cms_addon/conferences/ismb2020/tracks/functioncosi).

### Preprints & Under Review

#### **Self-Evolving Curriculum for LLM Reasoning**

Xiaoyin Chen, Jiarui Lu, Minsu Kim, Dinghuai Zhang, Jian Tang, Alexandre Piché, Nicolas Gontier, Yoshua Bengio, Ehsan Kamalloo.

<https://arxiv.org/abs/2505.14970>, 2025.

## When Greedy Wins: Emergent Exploitation Bias in Meta-Bandit LLM Training

Sanxing Chen, Xiaoyin Chen, Yukun Huang, Roy Xie, Bhuwan Dhingra.

<https://arxiv.org/abs/2509.24923>, 2025.

## Search-Based Correction of Reasoning Chains for Language Models

Minsu Kim, Jean-Pierre Falet, Oliver E. Richardson, Xiaoyin Chen, Moksh Jain, Sungjin Ahn, Sungsoo Ahn, Yoshua Bengio.

<https://arxiv.org/abs/2505.11824>, 2025.

## PipelineRL: Faster On-policy Reinforcement Learning for Long Sequence Generation

Alexandre Piché, Ehsan Kamalloo, Rafael Pardini, Xiaoyin Chen, Dzmitry Bahdanau.

<https://arxiv.org/abs/2509.19128>, 2025.

## BM25 Query Augmentation Learned End-to-End

Xiaoyin Chen, Sam Wiseman.

<https://arxiv.org/abs/2305.14087>, 2023.

## SELECTED PROJECTS

---

### Interactive Inductive Reasoning

May 2024

- Introduced an interactive benchmark that allows agents to propose queries and iteratively refine hypotheses based on feedback from an oracle;
- Built from abstract inductive reasoning tasks, e.g., program synthesis, but the initial observations do not fully specify the underlying rules;
- Leveraged programs as the oracle to provide feedback on agent queries;
- Enhanced the evaluation of LLM reasoning by introducing information-seeking capabilities, in contrast to traditional static evaluations.
- Demonstrated that LLMs achieve higher accuracy in rule induction through active querying compared to a non-interactive environment.

### Commonsense Reasoning via Knowledge Infused Text Generation

Dec. 2022

- Improved and implemented a general framework for applying arbitrary non-differentiable constraints to text generation inspired by cognitive Dual-System approach;
- Formulated text generation as a tree search problem and applied a modified Monte Carlo Tree Search algorithm;
- Utilized GPT-3 for fact checking to ensure the generated sentences are consistent with commonsense;
- Improved the average constraint satisfaction rate from 90.1% to 98.4% compared to the baseline.

## WORK EXPERIENCE

---

### Research Intern

Sep. 2025 – Present

*Snowflake Research, Menlo Park, USA*

- Worked on self-evolving agents.

### Visiting Researcher

Nov. 2024 – Jul. 2025

*ServiceNow Research, Montreal, Canada*

- Worked on training reasoning models and LLM agents.

## TEACHING EXPERIENCE

---

### Teaching Assistant

*Duke University*

- **CS590.05 Spring 2023:** Computational Biology.

### Undergrad Tutor & Grader

*University of California, Irvine*

- **ICS-33 Spring 2017:** Intermediate Programming in Python;
- **ICS-46 Fall 2018:** Data Structure Implementation and Analysis in C++.

## SERVICE

---

**Reviewer:** ACL, EMNLP, Neurips, ICLR, ICML