

# SHENGYU FENG

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Google Scholar ◊ Github ◊ LinkedIn

## EDUCATION

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### Carnegie Mellon University (CMU)

*Aug. 2022 – Present*

Ph.D. in Language and Information Technology, GPA: 4.03/4.30

Advisor: Yiming Yang

### University of Illinois at Urbana-Champaign (UIUC)

*Aug. 2020 – May 2022*

M.S. in Computer Science, GPA: 3.91/4.00

Advisor: Hanghang Tong

### University of Michigan (UM)

*Aug. 2018 – May 2020*

B.S.E in Computer Science, GPA: 4.00/4.00

### Shanghai Jiao Tong University (SJTU)

*Sep. 2016 – Aug. 2020*

B.S in Electrical and Computer Engineering, GPA: 3.67/4.00

## RESEARCH INTERESTS

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My research focuses on developing **artificial intelligence for mathematical problem solving (AI4Math)**, with an emphasis on methods that require minimal or no human supervision. I currently pursue two primary directions: (1) large language model-based mathematical reasoning, and (2) neural approaches for combinatorial optimization.

In addition, I apply combinatorial optimization to real-world applications such as high-performance computing, computer vision, biology, and information extraction. My earlier work spans self-supervised graph representation learning and reinforcement learning.

## WORK EXPERIENCE

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### Meta AI

*May 2025 – Aug. 2025 (expected)*

Research Intern

### Apple AIML

*May 2024 – Aug. 2024*

Research Intern

### Microsoft Research

*May 2022 – Aug. 2022*

Research Intern

### Intel AI Lab

*May 2021 – Aug. 2021*

Graduate Research Intern

## PUBLICATIONS (GROUPED BY RESEARCH AREAS, \*EQUAL CONTRIBUTION)

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### Large Language Model-based Mathematical Reasoning

[16] A Comprehensive Evaluation of Contemporary ML-Based Solvers for Combinatorial Optimization. **Shengyu Feng\***, Weiwei Sun\*, Shanda Li, Ameet Talwalkar, and Yiming Yang. *AI for Math Workshop (AI4MATH), ICML 2025*.

- [15] CO-Bench: Benchmarking Language Model Agents in Algorithm Search for Combinatorial Optimization. Weiwei Sun\*, **Shengyu Feng**\*, Shanda Li, and Yiming Yang. *Preprint*.
- [14] Step-by-Step Reasoning for Math Problems via Twisted Sequential Monte Carlo. **Shengyu Feng**, Xiang Kong, Shuang Ma, Aonan Zhang, Dong Yin, Chong Wang, Ruoming Pang, and Yiming Yang (Work done at Apple). *International Conference on Learning Representations (ICLR)*, 2025.

## Neural Approaches for Combinatorial Optimization

- [13] Regularized Langevin Dynamics for Combinatorial Optimization. **Shengyu Feng** and Yiming Yang. *International Conference on Machine Learning (ICML)*, 2025.
- [12] SORREL: Suboptimal-Demonstration-Guided Reinforcement Learning for Learning to Branch. **Shengyu Feng** and Yiming Yang. *AAAI Conference on Artificial Intelligence (AAAI)*, 2025 (*Oral, 6% of submissions*)

## Combinatorial Optimization for Real-World Applications

- [11] Towards an Introspective Dynamic Model of Globally Distributed Computing Infrastructures. Ozgur O. Kilic, David K. Park, Yihui Ren, Tatiana Korchuganova, Sairam Sri Vatsavai, Joseph Boudreau, Tasnuva Chowdhury, **Shengyu Feng**, Raees Khan, Jaehyung Kim, Scott Klasky, Tadashi Maeno, Paul Nilsson, Verena Ingrid Martinez Outschoorn, Norbert Podhorszki, Frédéric Suter, Wei Yang, Yiming Yang, Shinjae Yoo, Alexei Klimentov, and Adolfo Hoisie. *Preprint*.
- [10] Alternative Mixed Integer Linear Programming Optimization for Joint Job Scheduling and Data Allocation in Grid Computing. **Shengyu Feng**\*, Jaehyung Kim\*, Yiming Yang, Joseph Boudreau, Tasnuva Chowdhury, Adolfo Hoisie, Raees Khan, Ozgur O. Kilic, Scott Klasky, Tatiana Korchuganova, Paul Nilsson, Verena Ingrid Martinez Outschoorn, David K. Park, Norbert Podhorszki, Yihui Ren, Frederic Suter, Sairam Sri Vatsavai, Wei Yang, Shinjae Yoo, Tadashi Maeno, and Alexei Klimentov. *Preprint*.
- [9] AI Surrogate Model for Distributed Computing Workloads. David K. Park, Yihui Ren, Ozgur O. Kilic, Tatiana Korchuganova, Sairam Sri Vatsavai, Joseph Boudreau, Tasnuva Chowdhury, **Shengyu Feng**, Raees Khan, Jaehyung Kim, Scott Klasky, Tadashi Maeno, Paul Nilsson, Verena Ingrid Martinez Outschoorn, Norbert Podhorszki, Frederic Suter, Wei Yang, Yiming Yang, Shinjae Yoo, Alexei Klimentov, Adolfo Hoisie. *Workshop on Artificial Intelligence and Machine Learning for Scientific Applications (AI4S)*, SC 2024.
- [8] Concept Discovery for Fast Adaptation. **Shengyu Feng** and Hanghang Tong. *SIAM International Conference on Data Mining (SDM)*, 2023.
- [7] Exploiting Long-Term Dependencies for Generating Dynamic Scene Graphs. **Shengyu Feng**, Subarna Tripathi, Hesham Mostafa, Marcel Nassar, and Somdeb Majumdar. *IEEE/CVF Winter Conference on Applications of Computer Vision (WACV)*, 2023.
- [6] Coreference by appearance: Visually Grounded Event Coreference Resolution. Liming Wang, **Shengyu Feng**, Xudong Lin, Manling Li, Shih-Fu Chang, and Heng Ji. *Workshop on Computational Models of Reference, Anaphora and Coreference (CRAC)*, EMNLP 2021.

## Self-Supervised Graph Representation Learning

- [5] ARIEL: Adversarial Graph Contrastive Learning. **Shengyu Feng**, Baoyu Jing, Yada Zhu, and Hanghang Tong. *ACM Transactions on Knowledge Discovery from Data (TKDD)*.
- [4] X-GOAL: Multiplex Graph Prototypical Contrastive Learning. Baoyu Jing, **Shengyu Feng**, Yuejia Xiang, Xi Chen, Yu Chen, and Hanghang Tong. *ACM International Conference on Information and Knowledge Management (CIKM)*, 2022.

[3] Adversarial Graph Contrastive Learning with Information Regularization. **Shengyu Feng**, Baoyu Jing, Yada Zhu, and Hanghang Tong *ACM Web Conference (WWW)*, 2022.

## Reinforcement Learning

[2] Batch Reinforcement Learning Through Continuation Method. Yijie Guo, **Shengyu Feng**, Nicolas Le Roux, Ed Chi, Honglak Lee, and Minmin Chen. *International Conference on Learning Representations (ICLR)*, 2021.

[1] Memory Based Trajectory-conditioned Policies for Learning from Sparse Rewards . Yijie Guo, Jongwook Choi, Marcin Moczulski, **Shengyu Feng**, Samy Bengio, Mohammad Norouzi, and Honglak Lee. *Neural Information Processing Systems (NeurIPS)*, 2020.

## HONORS & AWARDS

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OpenAI Researcher Access Program Grant	2025
Siebel Scholars for class 2022, UIUC	2021
University Merit Student, SJTU	2017, 2018
Interdisciplinary Contest in Modeling (ICM) Meritorious Winner	2017

## TEACHING EXPERIENCE

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<b>Teaching Assistant, CMU</b> 11441/11741: Machine Learning with Graphs Instructor: Yiming Yang	Fall 2024
<b>Teaching Assistant, UIUC</b> CS 445: Computational Photography Instructor: Derek Hoime	Fall 2020, Spring 2021
<b>Instructional Aide, UM</b> EECS 442: Computer Vision Instructor: David Fouhey (Fall 2019) and Justin Johnson (Winter 2020)	Fall 2019, Winter 2020

## PROFESSIONAL SERVICE

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Organizer, CMU LLM Agent Workshop	2025
Reviewer, Neural Information Processing Systems (NeurIPS)	2021 – 2025
Reviewer, International Conference on Machine Learning (ICML)	2022 – 2025
Reviewer, International Conference on Learning Representations (ICLR)	2022 – 2024

## INVITED TALKS

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<b>Regularized Langevin Dynamics for Combinatorial Optimization</b> 2025 INFORMS Annual Meeting, oral presentation	Oct. 2025 (expected)
<b>Benchmarking LLM Agents in Algorithm Search</b> Massachusetts Institute of Technology (MIT), invited benchmark talk	April 2025

## LEADERSHIP & ENGAGEMENT

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Graduate Student Assembly Representative, CMU	2023 – Present
Member of Campus Affair Committee, CMU	2023 – 2025
Member of UM-SJTU Alumni Association, SJTU	2017 – 2020