Yifei He | Curriculum Vitae

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My research goal is to build efficient, generalizable and robust machine learning systems. I currently work on trustworthy machine learning, including domain adaptation/generalization, generative models and applications in high-stake tasks.

Education

University of Illinois Urbana-Champaign (UIUC) **Urbana, IL, USA**
M.S. in Computer Science *Aug 2021– May 2023 (Expected)*
Advisor: Prof. Han Zhao

University of Michigan (UM) **Ann Arbor, MI, USA**
B.S.E. in Data Science, minor in Mathematics *Aug 2019 - Apr 2021*
Summa Cum Laude

Shanghai Jiao Tong University (SJTU) **Shanghai, China**
B.S.E. in Electrical and Computer Engineering *Sept 2017 - Aug 2021*

Publications

(* denotes equal contribution)

[1] Generative Gradual Domain Adaptation with Optimal Transport.
Yifei He*, Haoxiang Wang*, Han Zhao.
Under review.

[2] Greedy Modality Selection via Approximate Submodular Maximization.
Yifei He*, Runxiang Cheng*, Gargi Balasubramaniam*, Yao-Hung Hubert Tsai, Han Zhao.
In *Proceedings of the 38th Conference on Uncertainty in Artificial Intelligence.* (UAI 2022)

[3] A Hierarchical Approach to Multi-Event Survival Analysis.
Donna Tjandra, **Yifei He**, Jenna Wiens.
In *Proceedings of the 35th AAAI Conference on Artificial Intelligence*. (AAAI 2021)

[4] Conformer-RL: A Deep Reinforcement Learning Library for Conformer Generation.
Runxuan Jiang, Tarun Gogineni, Joshua Kammeraad, **Yifei He**, Ambuj Tewari, Paul Zimmerman.
In *Journal of Computational Chemistry*.

Research Experience

Generative Progression Modeling of Alzheimer's Disease **Urbana, IL, USA**
Advisor: Prof. Haohan Wang, School of Information Science, UIUC *Sept 2022 - present*

- Used generative models to study the continuous progression of Alzheimer's Disease (AD) in terms of MRI scans given data in discrete time steps, contributing to the early diagnosis of AD.

Multi-Objective Optimization for Domain Generalization **Urbana, IL, USA**
Advisor: Prof. Han Zhao, Department of Computer Science, UIUC *July 2022 - present*

- Developed an efficient algorithm using excess risk estimation to improve the robustness of GroupDRO.

Generative Gradual Domain Adaptation **Urbana, IL, USA**

Advisor: Prof. Han Zhao, Department of Computer Science, UIUC *Mar 2022 - Sept 2022*

- Developed a framework to generate intermediate domains, improving domain adaptation under large distribution shift, alleviating the burden of data collection and extending the applications of gradual domain adaptation (GDA).
- Co-first-authored paper under review.

Modality Selection in Multimodal Learning **Urbana, IL, USA**

Advisor: Prof. Han Zhao, Department of Computer Science, UIUC *Aug 2021 - June 2022*

- Theoretically proved how to select the most informative subset of modalities given computational constraints.
- Co-first-authored publication at UAI 2022.

Reinforcement Learning (RL) for Sequential Conformer Search **Ann Arbor, MI, USA**

Advisor: Prof. Ambuj Tewari, Department of Statistics, UM *July 2020 - Apr 2021*

- Applied RL algorithms to efficiently find the most stable structure of large molecules.
- Publication at Journal of Computational Chemistry.
- Open-sourced Python library "conformer-rl".

Deep Learning for Multi-Event Survival Analysis **Ann Arbor, MI, USA**

Advisor: Prof. Jenna Wiens, Department of Computer Science, UM *Apr 2020 - Sept 2020*

- Applied multi-task and hierarchical learning to better model the inter-event relations in survival analysis.
- Publication at AAAI 2021.

Teaching Experience

CS 357 Numerical Methods I (UIUC) 2022 Fall, 2022 Spring
CS 441 Applied Machine Learning (UIUC) 2021 Fall
EECS 445 Intro to Machine Learning (UM) 2020 Fall

Skills

Specialties: Transfer Learning, Generative Models

Programming: Python, Java, C++, Matlab, R, SQL, JavaScript, HTML, LaTeX, Mathematica

Framework: PyTorch, TensorFlow, Keras, Gym, Hadoop