Tianfan Fu

CONTACT INFORMATION

Computational Science and Engineering
Georgia Institute of Technology
Atlanta, US
Email: futianfan@gmail.com & tfu42@gatech.edu
Voice: +1 4706013173
Homepage: `https://futianfan.github.io/`

RESEARCH INTERESTS

AI for Drug Discovery, Machine Learning for Healthcare, Natural Language Processing, Speech Processing, Bayesian Statistics.

EDUCATION

Georgia Institute of Technology, Atlanta, US.

Ph.D. candidate, Advisor: **Jimeng Sun**, Computer Science Program in Department of Computational Science and Engineering, August 2018 - Present.

Shanghai Jiao Tong University (SJTU), Shanghai, CHINA

M.S., Advisor: **Zhihua Zhang**, Computer Science and Technology, Sept 2015 - March 2018.

Shanghai Jiao Tong University (SJTU), Shanghai, CHINA

B.E., Electronics and Electric Engineering (IEEE Honor Class), Computer Science, Sept 2011 - June 2015.

RESEARCH EXPERIENCE

Research Assistant, Speech Lab, Shanghai Jiao Tong University (SJTU)

Advisor: **Kai Yu**, June 2013 - Jan 2015.
Research topic: application of deep learning on speech recognition and speaker verification.

Research Assistant, Learning and Optimization Group, Shanghai Jiao Tong University (SJTU)

Advisor: **Zhihua Zhang**, Feb 2015 - May 2017.
Research topic: Bayesian computation and inference.

Research Assistant, SunLab, Georgia Institute of Technology

Advisor: **Jimeng Sun**, Sept 2018 - Present.
Research topic: Drug Discovery, Predictive Phenotyping.

INDUSTRY EXPERIENCE

Research Intern, Machine Learning Group, IQVIA, Boston

Advisor: **Cao Xiao**, May 2020 - Aug 2020.
Research topic: clinical trial prediction

Research Intern, Machine Learning Group, Disney Research Institute, Pittsburgh

Advisor: **Cheng Zhang & Stephan Mandt**, Oct 2017 - Nov 2017.
Research topic: word/user embeddings algorithm

Intern, Dialogue System Group, AISPEECH, Suzhou, China

Project: Text Similarity for QA system, Feb 2018 - June 2018.

PUBLICATIONS

Tianfan Fu*, Wenhao Gao*, Cao Xiao, Jacob Yasonik, Connor W. Coley, Jimeng Sun. Differentiable Scaffolding Tree for Molecular Optimization. International Conference on Learning Representation (ICLR), 2022.

Tianfan Fu, Kexin Huang, Cao Xiao, Lucas M. Glass, Jimeng Sun. HINT: Hierarchical Interaction Network for Clinical Trial Outcome Prediction. Cell Patterns, 2022.

Kexin Huang*, **Tianfan Fu***, Wenhao Gao*, Yue Zhao, Yusuf Roohani, Jure Leskovec, Connor W.

Coley, Cao Xiao, Jimeng Sun, Marinka Zitnik: Therapeutics Data Commons: Machine Learning Datasets and Tasks for Drug Discovery and Development. Neural Information Processing Systems (**NeurIPS** 2021) Track on Datasets and Benchmarks.

Tianfan Fu, Cao Xiao, Lucas Glass, Jimeng Sun: MOLER: Incorporate Molecule-Level Reward to Enhance Deep Generative Model for Molecule Optimization. IEEE Transactions on Knowledge and Data Engineering (**TKDE**) 2021.

Tianfan Fu, Cao Xiao, Cheng Qian, Lucas Glass, Jimeng Sun: Probabilistic and Dynamic Molecule-Disease Interaction Modeling for Drug Discovery. The 27th ACM **SIGKDD** Conference on Knowledge Discovery and Data Mining (2021).

Tianfan Fu, Cao Xiao, Xinhao Li, Lucas Glass, Jimeng Sun: MIMOSA: Multi-constraint Molecule Sampling for Molecule Optimization. Association for the Advancement of Artificial Intelligence (**AAAI**) 2021.

Tianfan Fu, Cao Xiao, Lucas Glass, Jimeng Sun: α-MOP: Molecule Optimization with α-divergence. International Conference on Bioinformatics and Biomedicine (**BIBM**) 2020 (short paper).

Kexin Huang, **Tianfan Fu**, Lucas Glass, Marinka Zitnik, Cao Xiao, Jimeng Sun: DeepPurpose: a Deep Learning Library for Drug-Target Interaction Prediction. **Bioinformatics** 2020.

Tianfan Fu, Cao Xiao, Jimeng Sun: CORE: Automatic Molecule Optimization using Copy & Refine Strategy. Association for the Advancement of Artificial Intelligence (**AAAI**) 2020, New York, NY, USA. (**Oral**)

Tianfan Fu*, Tian Gao*, Cao Xiao, Tengfei Ma, Jimeng Sun: PEARL: Prototype Learning via Rule Learning. ACM Conference on Bioinformatics, Computational Biology, and Health Informatics (**ACM BCB**) 2019, Niagara Fall, NY, USA. (**Oral**)

Tianfan Fu*, Trong Nghia Hoang*, Cao Xiao, Jimeng Sun: DDL: Deep Dictionary Learning for Predictive Phenotyping. International Joint Conferences on Artificial Intelligence (**IJCAI** 2019), Macau, China. (**Oral**)

Tianfan Fu, Cheng Zhang, Stephan Mandt: Continuous Word Embedding Fusion via Spectral Decomposition. SIGNLL Conference on Natural Language Learning (**CoNLL** 2018), Brussels, Belgium. (**Oral**)

Shenjian Zhao, Yujun Li, **Tianfan Fu**, Kai Li, Zhihua Zhang: **Chinese Translation of "Deep Learning (Goodfellow et al)"**. Sales volume: receiving **200K+** comments in `jd.com`. **深度学习中译版** 京东评论200K+条

Tianfan Fu, Zhihua Zhang: CPSG-MCMC: Clustering-Based Preprocessing method for Stochastic Gradient MCMC. **AISTATS** 2017: 841-850, Lauderdale, FL, USA. (**Poster**)

Tianfan Fu, Luo Luo, Zhihua Zhang: Quasi-Newton Hamiltonian Monte Carlo. Conference on Uncertainty in Artificial Intelligence, **UAI** 2016, New York, NY, USA. (**Poster**)

Wei Li, **Tianfan Fu**, Hanxu You, Jie Zhu, Ning Chen: Feature sparsity analysis for i-vector based speaker verification. **Speech Communication** 80: 60-70, 2016.

Yuan Liu, Yanmin Qian, Nanxin Chen, **Tianfan Fu**, Ya Zhang, Kai Yu: Deep feature for text-dependent speaker verification. **Speech Communication** 73: 1-13, 2015. (**2019 EURASIP award for the best paper published in Speech Communication (2014-2017)**)

Wei Li, **Tianfan Fu**, Jie Zhu: An improved i-vector extraction algorithm for speaker verification. **EURASIP J. Audio, Speech and Music Processing** 2015: 18, 2015.

Wei Li, **Tianfan Fu**, Jie Zhu, Ning Chen: Sparsity Analysis and Compensation for i-Vector Based Speaker Verification. **SPECOM** 2015: 381-388.

Wei Deng, Yanmin Qian, Yuchen Fan, **Tianfan Fu**, Kai Yu: Stochastic data sweeping for fast DNN training. IEEE International Conference on Acoustics, Speech and Signal Processing, **ICASSP** 2014: 240-244.

Yuan Liu, **Tianfan Fu**, Yuchen Fan, Yanmin Qian, Kai Yu: Speaker verification with deep features. International Joint Conference on Neural Networks, **IJCNN** 2014: 747-753, Beijing, China (**Oral**)

Tianfan Fu, Yanmin Qian, Yuan Liu, Kai Yu: Tandem deep features for text-dependent speaker verification. **INTERSPEECH** 2014: 1327-1331, Singapore. (**Oral**)

Related Skills

- Programming Skills: Python, C++, Bash(awk, sed, etc.), LaTex, git, Pytorch, Tensorflow

Awards

- 2016 SJTU Academic Excellence Scholarship Class-A (Top 15%)
- 2017 CS Graduates Education & Development Fund and Yang Yuanqing Education Fund (Top-3 in all graduate students in CS Department).

Academic involvement

- 2016 UAI Travel Award & Volunteer
- 2016 NIPS (Neural Information Processing Systems) Reviewer (5 papers)
- 2017 AAAI sub-reviewer (2 papers)
- 2017 AISTATS Travel Award
- 2018 AAAI Reviewer (1 paper)
- 2019 Frontiers in Genetics (1 paper)
- Frontiers Bioengineering (1 paper)
- 2020 IEEE Journal of Biomedical and Health Informatics (JBHI) Reviewer (1 paper)
- 2020 IEEE Transactions on Cybernetics reviewer (1 paper)
- 2020 ICCCN (The 29th International Conference on Computer Communications and Networks) reviewer (1 paper).
- 2020 PLOS Computational Biology (1 paper)
- 2020 NeurIPS (6 papers)
- 2021 AAAI (3 papers)
- 2021 IJCAI (Senior Program Committee (SPC) members, 2 papers).
- 2021 ICML (5 papers).
- 2021 IEEE Transactions on Neural Networks and Learning Systems (TNNLS) (1 paper).
- 2021 KDD DLG (Deep Learning on Graphs) Workshop (2 papers).
- 2021 NeurIPS (1 paper).
- 2021 Mathematical Biosciences and Engineering (1 paper).
- 2022 ICLR (1 paper).
- Organizer of "AI for Science: Mind the Gaps". NeurIPS 2021 Workshop (`https://ai4sciencecommunity.github.io/`).

Teaching

- 2016 Spring Prof. Zhihua Zhang's course "Statistical Machine Learning" TA
- 2018 Spring Prof. Bo Yuan's course "Artificial Intelligence" TA
- 2019 Fall Prof. Jimeng Sun's course "Big Data Analytics for Healthcare" TA
- 2020 Spring Prof. Jimeng Sun's course "Big Data Analytics for Healthcare" TA
- 2020 Fall Prof. Jimeng Sun's course "Big Data Analytics for Healthcare" TA