- 范凤磊 -

康奈尔大学博士后
个人主页：https://scholar.google.com/citations?user=YPmyK2wAAAAJ&hl=zh-CN
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研究经历

2021.09 至今	康奈尔大学医学院公共卫生科学系王飞教授实验室	博士后
2020.01 – 2020.08	麻省理工学院-IBM 沃森人工智能实验室 Dimitry Krotov 小组	实习生
2017.09 – 2021.09	伦斯勒理工学院生物医学工程系王革教授实验室	研究助理
2016.09 – 2017.06	哈尔滨工业大学精密仪器学院刘俭教授实验室	研究助理
2016.06 – 2016.08	加拿大皇后大学物理系 Jean Michel Nunzi 教授实验室	暑期研修生
2015.01 – 2015.06	台湾新竹国立交通大学应用数学系翁志文教授课题组	研究助理

教育背景

2017.09 – 2021.07	伦斯勒理工学院生物医学工程	博士	导师：王革教授 AAAS&OSA&IEEE Fellow
2013.09 – 2017.06	哈尔滨工业大学光电信息科学与工程	学士	

工作经历

2019.05 – 2019.08	美国纽约通用电气全球研究中心暑期实习生	导师：Sangtae Ahn

研究兴趣

机器学习：深度学习方法、理论深度学习

医疗大数据：医学影像、生物信息学、精准医学

荣誉奖励

2019	IBM AI Horizon Fellowship	资助单位：IBM 优厚奖学金，涵盖博士毕业前的所有学费和生活费
2016	吴从炘奖学金	资助单位：哈尔滨工业大学 每年仅授予两名本科生
2015	人民奖学金	资助单位：哈尔滨工业大学
2014	富士施乐奖学金	资助单位：哈尔滨工业大学

发表论文

1) Niu C, Cong W, **Fan FL**, Shan H, Li M, Liang J, & Wang, G: Low-dimensional Manifold Constrained Disentanglement Network for Metal Artifact Reduction. arXiv preprint arXiv:2007.03882, 2020, To appear in *IEEE Transactions on Radiation and Plasma Medical Sciences*.

2) **Fan FL**, Wang D, Guo H, Zhu Q, Yan P, Wang G and Yu H: On a Sparse Shortcut Topology of Artificial Neural Networks, arXiv preprint arXiv:1811.09003. 2018 Nov 22, To appear in *IEEE Transactions on Artificial Intelligence*.

3) **Fan FL**, Xiong J, & Wang G: On Interpretability of Artificial Neural Networks: A Survey. *IEEE Transactions on Radiation and Plasma Medical Sciences*, 2021.

4) Li M, **Fan FL**, Cong W, Wang G: EM Estimation of the X-ray Spectrum with a Genetically Optimized Step-wedge Phantom. *Frontiers in Physics*, 9, 239, 2021

5) **Fan FL**, Li M, Teng Y, Wang G: Soft Autoencoder and Its Wavelet Adaptation Interpretation. *IEEE Transactions on Computational Imaging*, 6:1245-57, 2020.

6) **Fan FL**, Xiong J, & Wang G: Universal approximation with quadratic deep networks. *Neural Networks*, 124, 383-392, 2020.

7) Teng Y, Qi S, Han F, Yao Y, **Fan FL**, Lyu Q, & Wang, G: A framework for least squares nonnegative matrix factorizations with Tikhonov regularization. *Neurocomputing*, 387, 78-90, 2020.

8) **Fan FL**, Ahn S, De Man B, Wangerin KA, Wollenweber SD, Abbey CK, & Kinahan, PE: Deep learning-based model observers that replicate human observers for PET imaging. (*Oral presentation*) In *Medical Imaging 2020: Image Perception, Observer Performance, and Technology Assessment*, 2020.

9) **Fan FL**, Wang G: Fuzzy logic interpretation of quadratic networks. *Neurocomputing*, 2019.

10) **Fan FL**, Shan H, Kalra M K, Singh R, Qian G, Getzin M, Teng Y, Hahn J, and Wang G: Quadratic Autoencoder (Q-AE) for Low-dose CT Denoising. *IEEE Transactions on Medical Imaging*, 39(6):2035-50, 2019.

11) Teng Y, Yao Y, Qi S, Li C, Xu L, Qian W, **Fan FL**, ... & Wang, G: A novel framework for the NMF methods with experiments to unmixing signals and feature representation. *Journal of Computational and Applied Mathematics*, 362, 205-218, 2019.

12) **Fan FL**, Wang G: Learning from Pseudo-Randomness with an Artificial Neural Network–Does God Play Pseudo-Dice? *IEEE Access*, 6: 22987-22992, 2018.

13) Cheng YJ, **Fan FL**, Weng C (alphabetical order): An extending result on spectral radius of bipartite graphs. *Taiwanese Journal of Mathematics*, 22(2): 263-274, 2018.

14) **Fan FL**, Cong W, and Wang G: A new type of neurons for machine learning. *Int. J. for Number. Method. in Biomed. Eng.*, 34.2, e2920, 2018.

15) **Fan FL**, Cong W, & Wang G: Generalized backpropagation algorithm for training second-order neural networks. *Int. J. for Number. Method. in Biomed. Eng.* 34.5, e2956, 2018.

16) **Fan FL**, Weng C: A characterization of strongly regular graphs in terms of the largest signless Laplacian eigenvalues. *Linear Algebra and its Applications*, 506: 1-5, 2016.

预印论文

17) **Fan FL**, Lai RJ, Wang G: Quasi-Equivalency of Width and Depth of Neural Networks. arXiv preprint arXiv:2002.02515, 2020 (major revision in *Journal of Machine Learning Research*).

18) Zhang SQ and **Fan FL**: Neural Network Gaussian Processes by Increasing Depth. arXiv preprint arXiv:2108.12862, 2021 (corresponding author, under review in *IEEE Transactions on Neural Networks and Learning Systems*).

19) Niu C, **Fan FL**, Wang G Noise2Sim--Similarity-based Self-Learning for Image Denoising. arXiv preprint arXiv:2011.03384, 2020.

20) **Fan FL**, Li M., Wang F, Lai R and Wang G, Expressivity and Trainability of Quadratic Networks. arXiv preprint arXiv:2110.06081, 2021 (under review in *IEEE Transactions on Pattern Recognition and Machine Intelligence*).

21) Wang D*, Fan FL*, Hou BJ, Zhang H, Lai R, Yu H, Wang F Manifoldron: Direct Space Partition via Manifold Discovery. arXiv preprint arXiv:2201.05279, 2022 (*co-first author, submitted to IJCAI*).

演讲和报告

1) Invited talk at FDA, May 2021.
2) Invited job talk at Weill Cornell Medicine, Cornell University, January 2021.
3) Invited job talk at Department of Mathematics, Duke University, December 2020.
4) Poster presentation at fully3D 2019, Philadelphia, PA, June 2019.
5) Poster presentation at Graduate Symposium of Department of Biomedical Engineering, RPI, in January 2019.
6) Speaker for the Deep Recon Workshop 2017, RPI (the 1st deep learning based tomographic reconstruction conference in the world).
7) Invited Student Speaker at ICIPTMA 2017 (International Conference on Image Processing: Theory, Method and Applications), Harbin, China (only two students were selected from the university to make oral presentation).

学术任职

IEEE 会员；

知名学术期刊审稿人（International Journal of Numerical Methods in Biomedical Engineering,

IEEE Transactions on Medical Imaging, IEEE Transactions on Neural Networks and Learning System,

Computerized Medical Imaging and Graphics, IEEE Transactions on Fuzzy Systems).

学术推广

本人带领北京大学、加州理工学院、范德比尔特大学、新加坡国立大学等高校的研究生和博士后团队运营了一个名为“纯真学术出神入化”的微信公众号，为广大学子普及人工智能理论和应用知识，截至目前，公众号已发表原创文章 150 篇，关注 6000+人次，全文浏览量超过 70000 次。

– FENGLEI FAN (Male) –

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CORNELL UNIVERSITY
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RESEARCH EXPERIENCE

2021.09 - present	Postdoctoral Associate, Prof. Fei Wang's Lab, Department of Population Health Science, Weill Cornell Medicine, *Cornell University*, New York, NY, US
2020.01 – 2020.08	Research Intern, Dr. Dimitry Krotov's Group, *MIT-IBM Watson AI Lab*, Cambridge, MA, US
2017.09 – 2021.09	Research Associate, Prof. Ge Wang's Lab, Department of Biomedical Engineering, *Rensselaer Polytechnic Institute*, Troy, NY, US
2016.09 – 2017.06	Research Associate, Prof. Jian Liu's Lab, School of Precisive Instrument, *Harbin Institute of Technology*, Harbin, Heilongjiang, China
2016.06 – 2016.08	Visiting Student, Prof. Jean Michel Nunzi's Lab, Department of Physics, *Queen's University*, Kingston, Ontario, Canada
2015.01 – 2015.06	Visiting Student, Prof. Chin-Wen Weng's Group, Department of Applied Mathematics, *National Chiao Tung University*, Hsinchu, Taiwan, China

EDUCATION

2017.09 – 2021.07	Ph.D. in Biomedical Engineering, advisor: Prof. Ge Wang (AAAS&OSA&IEEE Fellow) *Rensselaer Polytechnic Institute*, Troy, NY, US
2013.09 – 2017.06	Bachelor's in Electrical Engineering, advisor: Prof. Jian Liu *Harbin Institute of Technology*, Harbin, Heilongjiang, China

WORK EXPERIENCE

2019.05 – 2019.08	Summer Intern, mentor: Dr. Sangtae Ahn, *GE Global Research Center*, Niskayuna, NY, US

RESEARCH INTEREST

Machin learning: deep learning methodology, theoretical deep learning

Healthcare big data: medical imaging, bioinformatics, precision medicine

HONORS AND AWARDS

2019	IBM AI Horizon Fellowship, IBM (a major fellowship covering tuition and living expenses until the end of PhD)

2016	Congxin Scholarship, Harbin Institute of Technology (awarded to only two undergraduates annually)
2015	People's Scholarship, Harbin Institute of Technology
2014	Fujixerox Scholarship, Harbin Institute of Technology

PUBLICATIONS

1) Niu C, Cong W, **Fan FL**, Shan H, Li M, Liang J, & Wang, G: Low-dimensional Manifold Constrained Disentanglement Network for Metal Artifact Reduction. arXiv preprint arXiv:2007.03882, 2020, To appear in *IEEE Transactions on Radiation and Plasma Medical Sciences*.

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16) **Fan FL**, Weng C: A characterization of strongly regular graphs in terms of the largest signless Laplacian eigenvalues. *Linear Algebra and its Applications*, 506: 1-5, 2016.

PREPRINTS

17) **Fan FL**, Lai RJ, Wang G: Quasi-Equivalency of Width and Depth of Neural Networks. arXiv preprint arXiv:2002.02515, 2020 (major revision in *Journal of Machine Learning Research*).

18) Zhang SQ and **Fan FL**: Neural Network Gaussian Processes by Increasing Depth. arXiv preprint arXiv:2108.12862, 2021 (corresponding author, under review in *IEEE Transactions on Neural Networks and Learning Systems*).

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PRESENTATION & TALKS

8) Invited talk at FDA, May 2021.
9) Invited job talk at Weill Cornell Medicine, Cornell University, January 2021.
10) Invited job talk at Department of Mathematics, Duke University, December 2020.
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14) Invited Student Speaker at ICIPTMA 2017 (International Conference on Image Processing: Theory, Method and Applications), Harbin, China (only two students were selected from the university to make oral presentation).

REVIEWER

International Journal of Numerical Methods in Biomedical Engineering,

IEEE Transactions on Medical Imaging, IEEE Transactions on Neural Networks and Learning System,

Computerized Medical Imaging and Graphics, IEEE Transactions on Fuzzy Systems.

OUTREACH

I lead a team of graduate students and post-docs from Peking University, California Institute of Technology, Vanderbilt University, National University of Singapore, etc. to operate a WeChat Blog named "**Authentic Scholars Create Miracles (纯真学者出神入化)**" to popularize science and knowledge to undergraduates and graduates with an emphasis on artificial intelligence theory and applications. Up to now, we have published 150 original articles, attracted 6,000 followers, and recorded over 70,000 full-text views.