

FANGHUI LIU

ESAT-STADIUS, KU Leuven

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Education Experience

Shanghai Jiao Tong University (SJTU)

Department of Automation

◦ Ph.D. in Pattern Recognition and Intelligent Systems

Sept 2014 - June 2019

Shanghai, China

Supervisor: [Prof. Jie Yang](#)

Harbin Institute of Technology (HIT)

Department of Automation

◦ B.Eng. in Automation

Sept 2010- June 2014

Harbin, China

Work Experience

KU Leuven, Belgium

Department of Electrical Engineering (ESAT-STADIUS)

◦ Postdoctoral researcher

– involved in Project: [ERC Advanced Grant E-DUALITY](#)

Oct 2019- present

Leuven, Belgium

Hosted by [Prof. Johan A.K. Suykens](#)

Research Interest

I'm generally interested in statistical machine learning, mainly on **kernel methods** including kernel learning, indefinite kernels (real, symmetric, but not positive definite), and random features for kernel approximation in large-scale situations. Besides, my research interest also includes **learning theory**, e.g., approximation theory and double descent. Previously, during the early stage of my doctoral period, I focused on visual tracking, a computer vision topic.

Selected Publications

Preprints and submitted papers

1. **Fanghai Liu**, Xiaolin Huang, Yudong Chen, and Johan A.K. Suykens. *Random features for kernel approximation: A survey on algorithms, theory, and beyond*, [arXiv:2004.11154](#).
2. **Fanghai Liu**, Xiaolin Huang, Yudong Chen, and Johan A.K. Suykens. *Towards a unified quadrature framework for large scale kernel methods*, [arXiv:2011.01668](#).
3. **Fanghai Liu***, Lei Shi*, Xiaolin Huang, Jie Yang, and Johan A.K. Suykens. *Regularized regression problem in hyper-RKHS for learning kernels*, [arXiv:1809.09910](#). (* indicates equal contribution)
4. **Fanghai Liu***, Lei Shi*, Xiaolin Huang, Jie Yang, and Johan A.K. Suykens. *Analysis of regularized least squares in reproducing kernel Kreĭn spaces*, [arXiv:2006.01073](#). (* indicates equal contribution)

Published or accepted papers

(More publications can be found in my [Google Scholar](#))

1. **Fanghui Liu**, Zhenyu Liao, and Johan A.K. Suykens. *Kernel regression in high dimensions: Refined analysis beyond double descent*, The 24th International Conference on Artificial Intelligence and Statistics (AISTATS), 2021.
2. **Fanghui Liu**, Xiaolin Huang, Yingyi Chen, and Johan A.K. Suykens. *Fast learning in reproducing kernel Kreĭn spaces via generalized measures*, The 24th International Conference on Artificial Intelligence and Statistics (AISTATS), 2021.
3. **Fanghui Liu**, Xiaolin Huang, Chen Gong, Jie Yang, and Li Li: *Learning data-adaptive nonparametric kernels*, Journal of Machine Learning Research (JMLR), 2020.
4. **Fanghui Liu**, Xiaolin Huang, Yudong Chen, Jie Yang, and Johan A.K. Suykens: *Random Fourier features via fast surrogate leverage weighted sampling*. The Thirty-Fourth AAAI Conference on Artificial Intelligence (AAAI), 2020.
5. **Fanghui Liu**, Xiaolin Huang, Lei Shi, Jie Yang, and Johan A.K. Suykens: *A double-variational Bayesian framework in random features for indefinite kernels*. IEEE Transactions on Neural Networks and Learning Systems (TNNLS), 2019.
6. **Fanghui Liu**, Xiaolin Huang, Chen Gong, Jie Yang, and Li Li: *Nonlinear pairwise layer and its training for kernel learning*. The Thirty-Second AAAI Conference on Artificial Intelligence (AAAI), 2018.
7. **Fanghui Liu**, Xiaolin Huang, Chen Gong, Jie Yang, and Johan A.K. Suykens: *Indefinite kernel logistic regression with Concave-inexact-convex procedure*. IEEE Transactions on Neural Networks and Learning Systems (TNNLS), 2018.
8. **Fanghui Liu**, Chen Gong, Xiaolin Huang, Tao Zhou, Jie Yang, and Dacheng Tao: *Robust visual tracking revisited: from correlation filter to template matching*. IEEE Transactions on Image Processing (TIP), 2018.

Academic services

· Conference Reviewers/PC Members

- ◇ *International Conference on Machine Learning (ICML) 2021*
- ◇ *International Conference on Artificial Intelligence and Statistics (AISTATS) 2021*
- ◇ *Neural Information Processing Systems (NeurIPS) 2020*
- ◇ *AAAI Conference on Artificial Intelligence (AAAI) 2020,2021*
- ◇ *International Conference on Data Mining (ICDM) 2017*

· Journal Reviewers

- ◇ *IEEE Transactions on Neural Networks and Learning Systems (2018-)*
- ◇ *IEEE Transactions on Image Processing (2018-)*
- ◇ *IEEE Transactions on Cybernetics (2018-)*
- ◇ *IEEE Transactions on Multimedia (2018-)*
- ◇ *Neurocomputing (2018-) (Outstanding Reviewer Award)*
- ◇ *IEEE Signal Processing Letters (2018-)*
- ◇ *Pattern Recognition Letters (2018-) (Outstanding Reviewer Award)*
- ◇ *Pattern Recognition (2017-) (Outstanding Reviewer Award)*
- ◇ *IEEE Transactions on Circuits and Systems for Video Technology (2016-)*

Selected Honors, Awards and Fellowships

Excellent Doctoral Dissertation Award	<i>2019</i>
<i>awarded by China Society of Image and Graphics (CSIG) (only ten graduates in China)</i>	
The “Academic Star” in Shanghai Jiao Tong University	<i>2018</i>
<i>awarded by Shanghai Jiao Tong University (only ten graduates in SJTU)</i>	
AAAI student travel award	<i>2018</i>
China National Scholarship for Doctoral Students	<i>2016,2017,2018</i>
<i>awarded by Ministry of Education of China for research performance</i>	
Meritorious Winner of the Mathematical Contest in Modeling (MCM)	<i>2013</i>
<i>awarded by the Consortium for Mathematics and Its Applications (COMAP)</i>	