FANGHUI LIU

LIONS Lab, École Polytechnique Fédérale de Lausanne (EPFL)
Email : fanghui.liu@epfl.ch   Homepage : www.lfhsgre.org

Education Experience

Shanghai Jiao Tong University (SJTU)   *Sept. 2014 - Jun. 2019*
Department of Automation   *Shanghai, China*
  ○ Ph.D. in Pattern Recognition and Intelligent Systems   Supervisor: Prof. Jie Yang

Harbin Institute of Technology (HIT)   *Sept. 2010- Jun. 2014*
Department of Automation   *Harbin, China*
  ○ B.Eng. in Automation

Work Experience

EPFL   *Oct. 2021- present*
Laboratory for Information and Inference Systems (LIONS Lab)   *Lausanne, Switzerland*
  ○ Postdoctoral researcher   Hosted by Prof. Volkan Cevher

KU Leuven   *Oct. 2019- Sep. 2021*
Department of Electrical Engineering (ESAT-STADIUS)   *Leuven, Belgium*
  ○ Postdoctoral researcher   Hosted by Prof. Johan A.K. Suykens
    − involved in Project: ERC Advanced Grant E-DUALITY

Research Interest

I'm generally interested in statistical machine learning, mainly on **kernel methods** including kernel learning, random features for large scale kernel approximation, and indefinite kernels (real, symmetric, but not positive definite). Besides, my research interest also includes **learning theory** in an approximation theory view to understand the generalization properties of kernel methods and over-parameterized models (motivated by neural networks) in high dimensions. Previously, during the early stage of my doctoral period, I focused on visual tracking, a computer vision topic.

Selected Publications

[xxx* indicates equal contribution; xxx indicates corresponding author(s)]

Preprint papers

1. **Fanghui Liu**, Johan A.K. Suykens, Volkan Cevher. *On the double descent of random features models trained with SGD*, 2021. arXiv:2110.06910.

Published or accepted papers

(More publications can be found in my Google Scholar)

1. **Fanghui Liu**, Xiaolin Huang, Yudong Chen, and Johan A.K. Suykens. *Towards a unified quadrature framework for large scale kernel methods*, `IEEE Transactions on Pattern Analysis and Machine Intelligence` (TPAMI), 2021. arXiv:2011.01668.

2. **Fanghui Liu***, Lei Shi*, Xiaolin Huang, Jie Yang, and Johan A.K. Suykens. *Generalization properties of hyper-RKHS and its applications*, `Journal of Machine Learning Research (JMLR)`, 2021. arXiv:1809.09910.

3. **Fanghui Liu**, Xiaolin Huang, Yudong Chen, and Johan A.K. Suykens. *Random features for kernel approximation: A survey on algorithms, theory, and beyond*, `IEEE Transactions on Pattern Analysis and Machine Intelligence (TPAMI)`, 2021. arXiv:2004.11154.

4. **Fanghui Liu***, Lei Shi*, Xiaolin Huang, Jie Yang, and Johan A.K. Suykens. *Analysis of regularized least squares in reproducing kernel Kreın spaces*, `Machine Learning`, 2021. arXiv:2006.01073.

5. **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. arXiv:2010.02681

6. **Fanghui Liu**, Xiaolin Huang, Yingyi Chen, and Johan A.K. Suykens. *Fast learning in reproducing kernel Kreın spaces via generalized measures*, `The 24th International Conference on Artificial Intelligence and Statistics (AISTATS)`, 2021. arXiv:2006.00247

7. **Fanghui Liu**, Xiaolin Huang, Chen Gong, Jie Yang, and Li Li: *Learning data-adaptive nonparametric kernels*, `Journal of Machine Learning Research (JMLR)`, 2020. arXiv:1808.10724

Academic services

· Program Committee/Conference Reviewers

⋄ *Conference on Uncertainty in Artificial Intelligence* (UAI) 2022
⋄ *International Conference on Learning Representations* (ICLR) 2022
⋄ *International Conference on Machine Learning* (ICML) 2021, 2022
⋄ *International Conference on Artificial Intelligence and Statistics* (AISTATS) 2021
⋄ *Neural Information Processing Systems* (NeurIPS) 2020, 2021
⋄ *AAAI Conference on Artificial Intelligence* (AAAI) 2020, 2021, 2022
⋄ *International Conference on Data Mining* (ICDM) 2017

· Journal Reviewers

Journal of Machine Learning Research, Artificial Intelligence, IEEE Transactions on Neural Networks and Learning Systems, IEEE Transactions on Image Processing, IEEE Transactions on Multimedia, IEEE Transactions on Circuits and Systems for Video Technology, Pattern Recognition, IEEE Transactions on Cybenetics, IEEE Signal Processing Letters, Neurocomputing, Pattern Recognition Letters.

Selected Honors, Awards and Fellowships

Excellent Doctoral Dissertation Award *2019*
awarded by China Society of Image and Graphics (CSIG) (only ten graduates in China)

AAAI student travel award *2018*

China National Scholarship for Doctoral Students *2016,2017,2018*
awarded by Ministry of Education of China for research performance