Zhenyu LIAO

Curriculum Vitae

July 2019

https://zhenyu-liao.github.io
+33 6 67 81 50 05
zhenyu.liao@l2s.centralesupelec.fr
Male, Chinese citizen, born in 28/08/1992.
Office A5-03, Breguet Building, CentraleSupélec, 3 rue Joliot Curie, 91192, Gif-sur-Yvette, France.

Education

2019	**Ph.D.**	Statistics and Machine Learning	L2S, CentraleSupélec, University Paris-Saclay, France.
2016	**M.Sc.**	Signal and Image Processing	CentraleSupélec, University Paris-Saclay, France.
2014	**B.Sc.**	Electronic Engineering	University Paris-Sud, France.
2014	**B.Sc.**	Optical & Electronic Information	Huazhong university of Science and Technology, China.

Internship

2016	Performance analysis of LS-SVM	with Prof. Romain Couillet	LANEAS, CentraleSupélec, France.
2015	Thermoelectric system modeling	with Damien Querlioz	IEF, Paris-Sud-CNRS, France.
2014	Teaching assistant in telecom	with Prof. Zhiyong Tao	FiberhomeTech, China.

Tutorials and invited talks

- Invited talk on "Recent Advances in Random Matrix Theory for Machine Learning and Neural Nets", workshop of the Matrix series on "Random matrix theory faces information era", Kraków, Poland, 2019.
- Invited talk on "Dynamical aspects of Deep Learning" (with Y. Chitour), Séminaire d'Automatique du plateau de Saclay of iCODE, Paris, France, 2019.
- Invited talk on "Recent Advances in Random Matrix for Neural Networks", workshop on deep learning theory, Shanghai Jiao Tong University, China, 2018.
- Tutorial on "Random Matrix Advances in Machine Learning and Neural Nets" (with R. Couillet and X. Mai), The 26th European Signal Processing Conference (EUSIPCO'18), Roma, Italy, 2018.

Publications

Papers in conference proceedings

1. **Zhenyu Liao** and Romain Couillet. On Inner-product Kernels of High Dimensional Data. In: *(submitted to) IEEE International Workshop on Computational Advances in Multi-Sensor Adaptive Processing (CAMSAP'19)*. 2019.
2. **Zhenyu Liao** and Romain Couillet. Inner-product Kernels are Asymptotically Equivalent to Binary Discrete Kernels. In: *(submitted to) The 33rd Conference on Neural Information Processing Systems (NeurIPS'19)*. 2019.
3. Xiaoyi Mai, **Zhenyu Liao**, and Romain Couillet. A Large Scale Analysis of Logistic Regression: Asymptotic Performance and New Insights. In: *2019 IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP'19)*. IEEE. May 2019, pp.3357–3361.
4. Romain Couillet, **Zhenyu Liao**, and Xiaoyi Mai. Classification Asymptotics in the Random Matrix Regime. In: *2018 The 26th European Signal Processing Conference (EUSIPCO'18)*. IEEE. Sept. 2018, pp.1875–1879.
5. **Zhenyu Liao** and Romain Couillet. The Dynamics of Learning: A Random Matrix Approach. In: *Proceedings of the 35th International Conference on Machine Learning (ICML'18)*. Vol. 80. PMLR, July 2018, pp.3072–3081.
6. **Zhenyu Liao** and Romain Couillet. On the Spectrum of Random Features Maps of High Dimensional Data. In: *Proceedings of the 35th International Conference on Machine Learning (ICML'18)*. Vol. 80. PMLR, July 2018, pp.3063–3071.
7. **Zhenyu Liao** and Romain Couillet. Random Matrices Meet Machine Learning: A Large Dimensional Analysis of LS-SVM. In: *2017 IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP'17)*. IEEE. Mar. 2017, pp.2397–2401.

Journal papers

1. Xiaoyi Mai and **Zhenyu Liao**. High Dimensional Classification via Empirical Risk Minimization: Improvements and Optimality. *(submitted to) IEEE Transactions on Signal Processing* (2019).
2. Yacine Chitour, **Zhenyu Liao**, and Romain Couillet. A Geometric Approach of Gradient Descent Algorithms in Neural Networks. *(submitted to) Journal of Differential Equations* (2019).

3. **Zhenyu Liao** and Romain Couillet. A Large Dimensional Analysis of Least Squares Support Vector Machines. *IEEE Transactions on Signal Processing* **67**(4) (Feb. 2019), 1065–1074.
4. Cosme Louart, **Zhenyu Liao**, and Romain Couillet. A Random Matrix Approach to Neural Networks. *The Annals of Applied Probability* **28**(2) (Apr. 2018), 1190–1248.

Peer reviewing activities

- Neural Information Processing Systems (**NeurIPS**)
- International Conference of Machine Learning (**ICML**)
- IEEE Transactions on Signal Processing (**IEEE-TSP**)
- Neural Processing Letters

Teaching duties

2017 Signal and system 1 lab work with Prof. Laurent Le Brusquet,CentraleSupélec 54 hours.

References

- **Prof. Romain Couillet**
  - Full Professor at CentraleSupélec, University Paris-Saclay, Paris, France.
  - Holder of the UGA IDEX GSTATS DataScience Chair, University of Grenoble-Alpes, France.
  - ✉ romain.couillet@gipsa-lab.grenoble-inp.fr
- **Prof. Yacine Chitour**
  - Full Professor at Pairs-Sud, University Paris-Saclay, Paris, France.
  - Director of the iCODE institute, University Paris-Saclay, Paris, France.
  - ✉ yacine.chitour@l2s.centralesupelec.fr