

CURRICULUM VITAE

Zhenyu LIAO

Present Address

CentraleSupélec, L2S
Office A5. 03
3 rue Joliot Curie
91192, Gif-sur-Yvette, France

Personal information

Date of Birth: 28/08/1992
Sex: Male
Citizenship: Chinese
E-mail: zhenyu.liao@l2s.centralesupelec.fr
Website: <https://zhenyu-liao.github.io/>

Education

- **Ph.D.** in Statistics and Machine Learning, **L2S, CentraleSupélec**, France 2016-present
 - Thesis: A Random Matrix Approach to Deep Neural Networks Analysis.
 - Supervisors: **Prof. Romain Couillet**, **Prof. Yacine Chitour**.
- **M.Sc.** in Signal and Image Processing, **CentraleSupélec/Paris-Sud (11)**, France 2014-2016
- **B.Sc.** in Electronic Engineering, **Paris-Sud (11)**, France 2013-2014
- **B.Sc.** in Optical & Electronic Information, **HUST**, Wuhan, China 2010-2014

Internship

- **Research intern**, **LANEAS Group, CentraleSupélec**, France. Summer 2016
 - Research intern: random matrix analysis of support vector machines.
 - Supervisor: **Prof. Romain Couillet**
- **Research intern**, **IEF**, Paris-Sud-CNRS, France. Summer 2015
 - Research intern: modeling and circuits design of a thermoelectric system.
 - Supervisors: **Damien Querlioz** and **Jérôme Saint Martin**
- **Intern**, **FiberhomeTech**, China. Summer 2014
 - Teaching assistant in a technical conference on telecommunication.
 - Supervisor: Prof. Zhiyong TAO

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.

Teaching

- 2017-2018: Lab work of Signal and System 1, with **Prof. Laurent Le Brusquet**, Department of Signal and Statistics, CentraleSupélec: 54 hours.

Academic activities

Paper review

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

Publications

Conferences

- X. Mai, **Z. Liao**, R. Couillet, “A Large Scale Analysis of Logistic Regression: Asymptotic Performance and New Insights”, IEEE International Conference on Acoustics, Speech and Signal Processing (**ICASSP’19**), Brighton, UK, 2019.
- R. Couillet, **Z. Liao**, X. Mai, “Classification Asymptotics in the Random Matrix Regime”, The 26th European Signal Processing Conference (**EUSIPCO’18**), Rome, Italy, 2018.
- **Z. Liao**, R. Couillet, “The Dynamics of Learning: A Random Matrix Approach”, The 35th International Conference on Machine Learning (**ICML 2018**), Stockholm, Sweden, 2018.
- **Z. Liao**, R. Couillet, “On the Spectrum of Random Features Maps of High Dimensional Data”, The 35th International Conference on Machine Learning (**ICML 2018**), Stockholm, Sweden, 2018.
- **Z. Liao**, R. Couillet, “Random Matrices Meet Machine Learning: A Large Dimensional Analysis of LS-SVM”, IEEE International Conference on Acoustics, Speech and Signal Processing (**ICASSP’17**), New Orleans, USA, 2017.

Journals

- X. Mai, **Z. Liao**, “High Dimensional Classification via Empirical Risk Minimization: Improvements and Optimality”, (submitted to) IEEE Transactions on Signal Processing (**IEEE-TSP**), 2019.
- Y. Chitour, **Z. Liao**, R. Couillet, “A Geometric Approach of Gradient Descent Algorithms in Neural Networks”, (submitted to) Journal of Differential Equation (**JDE**), 2019.
- C. Louart, **Z. Liao**, R. Couillet, “A Random Matrix Approach to Neural Networks”, The Annals of Applied Probability (**AAP**) 28 (2), 1190-1248, 2018.
- **Z. Liao**, R. Couillet, “A Large Dimensional Analysis of Least Squares Support Vector Machines”, IEEE Transactions on Signal Processing (**IEEE-TSP**) 67 (4), 1065-1074, 2019.

Research interests

- Machine Learning
- Random Matrix Theory
- High Dimensional Statistics
- Signal Processing

References

- **Prof. Romain Couillet**

- Full Professor at CentraleSupélec, University Paris-Saclay, Paris, France.
- Holder of the UGA IDEX GSTATS DataScience Chair at GIPSA-lab, University of Grenoble-Alpes, France.
- Mail: 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.
- Mail: yacine.chitour@l2s.centralesupelec.fr

Updated on May, 2019.
[Visit here](#) for a (more or less) up-to-date CV.