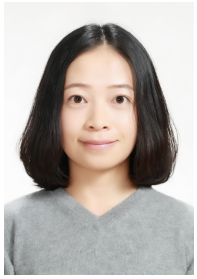
WENCAN ZHU

Ph.D. in Applied Mathematics

wzhu@mrc-lmb.cam.ac.uk +44-07471408666
13 Stansgate Avenue, CB2 0QZ Cambridge, UK
github.com/valerychu
orcid.org/0000-0002-1234-9467
https://valerychu.github.io/Homepage/



RESEARCH EXPERIENCE

MRC Laboratory of Molecular Biology

Postdoctoral Scientist

2023 – Present | Cambridge, United Kingdom

- Linking genotype with phenotype through systematic analysis of genomic and phenotype ontology data for both coding and non-coding regions.

University of Paris-Saclay & Sanofi R&D

PhD Research

2019 – 2022 | Paris, France

- Dissertation: development of novel machine learning methods for biomarker selection in high-dimensional settings with strong correlations.
  - WLasso and Generalized Elastic Net: select progsnotic biomarkers by whitening the design matrix (linear regression model).
  - PPLasso: simultaneously select prognostic and predictive biomarkers (ANCOVA-type model).
  - WLogit: extension of WLasso to binary classification.
- Project
  - Applied the methods above to projects of Sanofi (RNAseq and Olink data as examples)
- Supervision
  - supervised a graduate internship on the comparison of R package LIMMA and classical ANCOVA model.

Sanofi R&D

Biostatistician

2018 – 2019 | Chilly-Mazarin, France

- Statistical modeling with Omics data (RNAseq, GWAS):
  - Preprocessing
  - Identification of associated biomarkers
  - Machine learning regression/classification

ENSAI & Sanofi R&D

Graduate internship

2018 | Chilly-Mazarin, France

- Comparison of penalized regression and screening approaches for the identification of prognostic biomarkers
  - Compared and studied performance of different methods (Lasso, SCAD, Elastic-Net, Adaptive Ridge, Adaptive Lasso, univariate analysis) regarding the efficiency of selection and prediction.
  - Investigated on pres-screening by SIS

EDUCATION

Ph.D. in Applied Mathematics

University of Paris-Saclay

2022 | Paris, France

M.Sc. in Biostatistics

ENSAI (National School for Statistics and Data Analyse)

2018 | Rennes, France

M.Sc. in Bioinformatics

Faculty of Medicine, Rennes 1 University

2018 | Rennes, France

M.Sc. in Mathematics

Department of Mathematics, Tongji University

2018 | Shanghai, China

B.Sc. (major) in Mathematics

Department of Mathematics, Tongji University

2015 | Shanghai, China

B.A. (minor) in Japanese

Department of Literature, Tongji University

2015 | Shanghai, China

IT SKILLS

R | Python | JAVA | C++ | R Shiny | LaTeX | SAS | LINUX

LANGUAGES

Mandarin
English
French
Japanese
German

PUBLICATIONS

Journal Articles

- **Zhu, W.**, Lévy-Leduc, C., & Ternès, N. (2021). A variable selection approach for highly correlated predictors in high-dimensional genomic data. *Bioinformatics*, 37(16), 2238–2244.
- **Zhu, W.**, Lévy-Leduc, C., & Ternès, N. (2022). Identification of prognostic and predictive biomarkers in high-dimensional data with PPLasso. *BMC Bioinformatics (DOI 10.1186/s12859-023-05143-0)*.
- **Zhu, W.**, Adjakossa, E., Lévy-Leduc, C., & Ternès, N. (2021). Sign consistency of the generalized elastic net estimator. Undergoing peer review. (arXiv: 2106.05454 [math.ST])
- **Zhu, W.**, Lévy-Leduc, C., & Ternès, N. (2022). Variable selection in high-dimensional logistic regression models using a whitening approach. Undergoing peer review. (arXiv: 2206.14850 [stat.ME])
- Liu, F., **Zhu, W.**, Shoaito, H., Chissey, A., Degrelle, S. A., & Fournier, T. (2020). Mining of combined human placental gene expression data across pregnancy, applied to PPAR signaling pathway. *Placenta*, 99, 157–165.
- Liu, F., Rouault, C., Guesnon, M., **Zhu, W.**, Clément, K., Degrelle, S. A., & Fournier, T. (2020). Comparative Study of PPARγ Targets in Human Extravillous and Villous Cytotrophoblasts. *PPAR research*, 9210748.
- Liu, F., Simasotchi, C., Vibert, F., **Zhu, W.**, Gil, S., Degrelle, S. A., & Fournier, T. (2021). Age and Sex-Related Changes in Human First-Trimester Placenta Transcriptome and Insights into Adaptative Responses to Increased Oxygen. *International journal of molecular sciences*, 22(6), 2901.
- Liu, F., Rouault, C., Clément, K., **Zhu, W.**, Degrelle, S. A., Charles, M. A., Heude, B., & Fournier, T. (2021). C1431T Variant of PPARγ Is Associated with Preeclampsia in Pregnant Women. *Life (Basel, Switzerland)*, 11(10), 1052.

Book

- **Zhu, W.**, Ardilly, P., Bouche, P (2018). Handbook of spatial analysis (Chapter 12. Small areas and spatial correlation). INSEE-Eurostat.

Package R

- **Zhu, W.** (2022). *WLogit: Whitening logistic regression with regularization*.
- **Zhu, W.**, Lévy-Leduc, C., & Ternès, N. (2022b). *PPLasso: Prognostic and predictive biomarker identification*.
- **Zhu, W.**, Lévy-Leduc, C., & Ternès, N. (2020). *WLasso: Whitening lasso for variable selection*.

Conference Communications (oral presentation)

- ISCB (International Society for Clinical Biostatistics) Zhu, W., Lévy-Leduc, C., & Ternès, N. (2022). Identification of prognostic and predictive biomarkers in high-dimensional data with pplasso.
- JDS (Journées de Statistique) Zhu, W., Lévy-Leduc, C., & Ternès, N. (2022). Identification of prognostic and predictive biomarkers in high-dimensional data with pplasso.
- SMPGD (Statistical Methods for Post Genomic Data) Zhu, W., Lévy-Leduc, C., & Ternès, N. (2022). Wlasso: Variable selection for highly correlated predictors (application to genomic data).
- ISCB (International Society for Clinical Biostatistics) Zhu, W., Lévy-Leduc, C., & Ternès, N. (2020). A variable selection approach for highly correlated predictors in high-dimensional genomic data.

REFEREES

Céline Lévy-Leduc (Professor)
AgroParisTech, INRAE, University of Paris-Saclay
] celine.levy-leduc@agroparistech.fr

Nils Ternès (Statistical Biomarker Leader)
Sanofi R&D
] nils.ternes@sanofi.com

FELLOWSHIP

- Eiffel scholarship program of excellence, French Ministry for Europe and Foreign Affairs, 2016-2018