

LIZHONG CHEN

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Education

- The University of Melbourne** Doctor of Philosophy (PhD) in Statistics **02/2017 – 02/2022**
Supervisors: A/Prof. Guoqi Qian, Prof. Yuriy Kuleshov, Dr Tingjin Chu
Thesis: Model selection and averaging by Gibbs sampler with a tropical cyclone seasonal forecasting application
- Peking University** Master of Science (M.S.) in Mathematics **09/2013 – 07/2016**
Mentor: A/Prof. Houhong Fan
Thesis: A Report on Computations of Cohomology Rings and Homotopy Groups of Lie Groups
- Peking University** Bachelor of Science (B.S.) in Mathematics **09/2013 – 07/2016**

Research Experience

- Smyth Lab, WEHI** *Research Officer* **03/2022 – present**
Supervisor: Prof. Gordon K Smyth

Publications

- Baldoni, P. L., Chen, L., and Smyth, G. K. (2024). Faster and more accurate assessment of differential transcript expression with gibbs sampling and edger v4. *NAR Genomics and Bioinformatics*, 6(4).
- Chen, Y., Chen, L., Lun, A. T., Baldoni, P. L., and Smyth, G. K. (2025). edger v4: powerful differential analysis of sequencing data with expanded functionality and improved support for small counts and larger datasets. *Nucleic Acids Research*, 53(2).
- Qian, G., Chen, L., and Kuleshov, Y. (2022). Improving methodology for tropical cyclone seasonal forecasting in the australian and the south pacific ocean regions by selecting and averaging models via metropolis-gibbs sampling. *Remote Sensing*, 14(22):5872.
- Wang, J., Chen, L., Thijssen, R., Phipson, B., and Speed, T. P. (2024). Glmsim: a glm-based single cell rna-seq simulator incorporating batch and biological effects. *bioRxiv*, pages 2024-03.

Talks and Presentations

- edgeR quasi-likelihood: correcting deviance for bias** Bioinformatics division seminar, WEHI **08/2022**
- Extending edgeR for small counts and large samples** Bioinformatics division seminar, WEHI **05/2023**
- Applying edgeR for alternative splicing analysis** Bioinformatics division seminar, WEHI **04/2024**

Teaching Experience

- The University of Melbourne** *Tutor* **07/2017 - 02/2022**
Linear Algebra, Accelerated Mathematics I/II, Complex Analysis, Multivariate Statistical Techniques
- The University of Melbourne** *Assignment and Exam Marker* **07/2018 - 07/2021**
Statistical Modelling, Mathematical statistics
- Peking University** *Teaching assistant* **09/2013 - 07/2016**
Mathematical analysis I/II, Calculus I, Advanced algebra I

Honors and scholarships

- Melbourne Research Scholarship** The University of Melbourne **2017**
- Outstanding Graduate of Beijing** **2016**
- Outstanding Graduate of Peking University** Peking University **2016**
- Guanghua Scholarship** Peking University **2015**
- National Scholarship** Peking University **2014**
- Second-Class Freshmen Scholarship** Peking University **2009**

Projects

IBGS (Iterated Blockwise Gibbs Sampler)

IBGS is an MCMC search algorithm designed to find the best model in the high dimensional data given a model selection criterion such as AIC, BIC and so on. Moreover, it can identify those most important covariates having the significant influence on the response.

edgeR (Empirical Analysis of Digital Gene Expression Data in R)

We develop the new quasi-likelihood method for differential expression analysis using the exact calculation for unit deviance of Negative Binomial distribution.

statmod: Statistical Modeling

We make the exact distributional calculations for unit deviances of Binomial, Poisson and Negative Binomial distributions.

limma (Linear Models for Microarray and Omics Data)

We update the estimation for the prior distribution in empirical Bayes approach.

Referee services

Applied mathematical modelling, Nucleic Acids Research, Australian & New Zealand Journal of Statistics