

Rui Liu

Department of Statistics and Operations Research, University of North Carolina at Chapel Hill

Chapel Hill, NC, 27599

Tel: 86-15801111673 (China)/1-984-322-1293 (US) | E-mail: jerryliu@unc.edu

EDUCATIONAL BACKGROUND

- **Department of Statistics and Operations Research, University of North Carolina at Chapel Hill**
Ph.D. in Statistics
Aug 2021 – Present
 - **Advisor:** Prof. *J.S.(Steve) Marron*
- **School of Mathematical Science, Peking University (PKU), Beijing, China**
Bachelor of Science in Statistics
Sep 2016 – Jul 2020
 - **Advisor:** Prof. *Song Xi Chen*

PROFESSIONAL EXPERIENCE

University of North Carolina at Chapel Hill Aug 2021 - Present

Graduate Teaching Assistant, Department of Statistics and Operations Research

- Responsible for holding office hours, grading homework and grading exams.

University of North Carolina at Chapel Hill Aug 2020 - Feb 2021

Research Assistant, Department of Statistics and Operations Research, **Advisor:** Prof. *J.S.(Steve) Marron*

Topic: Suitability of Time-varying SIR Models

- Useful insight into the evolution of Covid-19 pandemics comes from SIR models. These reveal a key time varying parameter R_0 , which reflects the number of people each infected person will infect in turn.
- Finding that in most states the recovered data are very unreliable which renders the SIR models unusable.
- Conducting a new measure: estimated recovery time (ERT) key to assessment of reliability of the data. The states whose data has passed the assessment can be used in further analysis.

Peking University Feb 2018 - Jul 2021

Research Assistant, Center for Statistical Science, **Advisor:** Prof. *Song Xi Chen*

Topic: Estimating Radiative Effect of PM on Ozone Pollution in Six Northern China Cities

- the amount of recent increase in the ground level O₃ caused by the increased radiation due to a reduction of the PM concentration.
- Designed polynomial statistical models by utilizing forward stepwise regression and variable selection to quantify the relationship between PM₁₀ and radiation.
- Compared the fitting error and prediction error of VAR model and nonparametric model of O₃.
- Combined the two former steps and conducted a spatial time series model to explain the contribution of PM₁₀ on O₃'s increasing.

Topic: Air Quality Assessment

- Conducted quantitative analysis of the impact of meteorological and human factors on percentage of inter-annual variation of air pollutants; divided 45 cities into three categories based on positive and negative effects of these two factors.
- Explored air quality over the past six years through data cleaning and visualization using R and proposed practical suggestions for air quality management in 45 cities.

PUBLICATIONS

- Li, S.*, **Liu, R.***, Wang, S., Chen, S.X (2021). Radiative Effects of Particular Matters on Ozone Pollution in Six North China Cities. *Journal of Geophysical Research: Atmospheres*, to appear.
- Sun, H., You, W., Guo, B., Luo, S., Zheng, X., Han T., Wang X., **Liu, R.**, Huang Y., He, J., Chen, L., Wang, H., and Chen, S.X. (2020). Air Quality Assessment Report VII: Statistical Analysis of “2+66” cities. http://songxichen.gsm.pku.edu.cn/Uploads/Files/Report/Air_Quality_Assessment_Report_VII.pdf Technical Report (in Chinese), 2020.
- Liu, H., Ye, F., Sun, H., Guo, B., **Liu, R.**, Xiao, J., He, J., Zheng, X., Wang, H., and Chen, S.X. (2019). Air Quality Assessment Report VI: Statistical Analysis of “2+43” cities. http://songxichen.gsm.pku.edu.cn/Uploads/Files/Report/Air_Quality_Assessment_Report_VI.pdf Technical Report (in Chinese), 2019.

TALKS and PRESENTATIONS

Invited Conference Presentations

1. “Suitability of Time-varying SIR Models”, Presentation, NSF Student Conference on COVID-19 Modelling, Jan, 2021.

Invited Colloquia and Seminars

1. “Suitability of Time-varying SIR Models”, Department of Statistics and Operations Research, University of North Carolina at Chapel Hill, Apr, 2021.

TEACHING

At University of North Carolina at Chapel Hill

Undergraduate level

1. Method of Data Science, STOR 455, 2021 Fall, Teaching Assistant, 97 students.