Xueqing Liu

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Education

Peking University	Expected 06/2021
Master of Epidemiology and Health Statistics	Beijing, China

GPA: 3.5/4.0

Advisor: Xiao-hua (Andrew) Zhou

Thesis: Free-response receiver operating characteristic method and multi-reader multi-case analysis

Peking University	06/2019
Bachelor of Medicine & Bachelor of Mathematics and Applied Mathematics	Beijing, China

GPA: 3.4/4.0 (top 30%), 3.7/4.0 (Major), 3.6/4.0 (Junior/Senior)

Research Experience

Statistical methods for analyzing multi-reader free response receiver operating characteristic (FROC) datasets   02/2020 – present

Graduate Researcher   Supervisor: Prof. Xiao-hua Zhou   Beijing, China

When evaluating diagnostic imaging tests, the multi-reader, multi-case free response study design is typically used, which gives rise to cross-correlated data structure. The existing methods cannot fully address this issue and ignore the effects of addition covariates on accuracy estimates as well.

- Proposed a marginal regression model for the area under the alternative FROC curves (AFROC-AUC)
- Derived covariate-adjusted AFROC-AUC to summarize the overall accuracy of a diagnostic test while taking the covariates information into consideration
- Conducted simulation studies and real example analysis to verify the performance of the new method
- Compiled the approach, simulation, and real example results into a manuscript for submission
- Wrote a tutorial article on the evaluation of imaging tests in collaboration with other researchers

Correcting for both imperfect gold standard bias and verification bias in estimating the accuracy of two diagnostic tests   06/2020 – 10/2020

Graduate Researcher   Supervisor: Prof. Xiao-hua Zhou   Beijing, China

When the reference test is imperfect and is only given to a non-random subgroup, imperfect gold standard bias and verification bias could arise, leading to biased estimates of the sensitivity and specificity. The existing Bayesian method is sensitive to prior distribution and is less efficient.

- Developed a maximum likelihood procedure for simultaneous correcting both verification bias and imperfect gold standard bias in collaboration with Lu Wang
- Implemented the novel approach to the COVID-19 example and derived unbiased accuracy estimates of chest CT and RT-PCR for detecting COVID-19
- Wrote both the methods and the results sections of the article and submitted the work for publication

Modeling and forecasting the ambulance demand in Beijing using Gaussian Mixture Model with logistic weights   04/2020 – present

Graduate Researcher   Supervisor: Prof. Xiao-hua Zhou   Beijing, China

- Summarized the existing spatio-temporal approaches for modelling the overall ambulance demand in Beijing
- Utilized the Gaussian Mixture model with logistic weights to capture the spatial and temporal structure
- Proposed a new algorithm based on Variational Bayesian methods that could increase computational efficiency

Causal Inference in two-sample Mendelian randomization studies   03/2020 – 06/2020

Course project   Supervisor: Prof. Xiao-hua Zhou   Beijing, China

- Reviewed existing statistical methods for estimating causal parameters in two-sample Mendelian randomization studies
- Conducted simulation studies to compare existing estimators of causal effects
- Implemented the two-sample, two-stage least square estimator in a real example and compiled results into a report

A meta-analysis of the accuracy of computer-aided diagnostic devices for lung cancer   05/2019 – 07/2019

Course project   Supervisor: Prof. Feng Sun   Beijing, China

- Formulated a literature retrieval strategy and established the inclusion and exclusion criteria for the meta-analysis
- Extracted accuracy information, sorted, and analyzed the summary data using a random effect model
- Compiled the results and wrote a report in English

Publications

1 **Xueqing Liu**, Xiao-hua Zhou*. (Accepted with minor revisions 2020) "The free-response receiver operating characteristic method and the corresponding multi-reader multi-case analysis." *Chinese Journal of Health Statistics.*

2 **Xueqing Liu**, Xiao-hua Zhou*. (Preparing to Submit 2020) "A novel regression model for multi-reader multi case free-response receiver operating characteristics studies of diagnostic tests."

3 Lu wang, **Xueqing Liu**, Chen Xia, Jun Liu, Xiao-hua Zhou*. (Under Review 2020) "Correcting for imperfect gold standard and verification bias in estimating accuracy of diagnostic tests: An application in COVID-19 diagnosis."

4 **Xueqing Liu**, Yuying Li, Jiarui Sun, Xiao-hua Zhou*. (Preparing to Submit 2020) "FROC, LROC and ROI: The location-specific ROC analysis."

Teaching and Internship Experience

Peking University Health Science Center	09/2020 – 11/2020
Teaching assistant for *Biostatistics*	Beijing, China

- Assisted professors in creating course plans and writing syllabi
- Maintained the course website, including posting assignments, answering questions and posting notes
- Responded to student inquiries regarding grades, assignments, and course material

Beijing Center for Disease Control and Prevention	07/2018 – 09/2018
Public Health Rotational Intern	Beijing, China

- Sorted and analyzed the annual death data and infectious diseases surveillance data in the Department of Statistics
- Supported the organization and management of health education programs in the Department of Chronic Diseases

Beijing Shijitan Hospital	02/2017 – 01/2018
Undergraduate Clinical Intern	Beijing, China

- Rotating internship in the Internal medicine, Surgery and other key departments
- Assisted in patients' admissions, medical record handling and other work processes

Xian Janssen Pharmaceutical Ltd.	01/2018 – 06/2018
Medical Affairs Intern	Beijing, China

- Managed the application review process of nearly 100 medical projects, and summarized the revision opinions
- Used Excel formulas and pivot tables to analyze KPI data of each team and produced six monthly reports

Leadership Experience

Perking University Child Health Education Program	07/2017 – 09/2017
Organizer	Jilin, China

- Planned all aspects of the program: health lessons preparation, and brochure design
- Contacted and coordinated with the local communities and schools for related issues

Peking University Hepatitis B Campaign Program	07/2016 – 08/2016
Core member	Chengdu, China

- Educated community residents about the prevention, treatment and management of Hepatitis B
- Investigated the local residents' understanding of Hepatitis B-related knowledge and wrote a report

Peking University "Love for Thousands of Miles" Volunteer Teaching Program	07/2015 – 08/2015
Core member	Guizhou, China

- Designed and taught "Funny Math" course to children in an effort to make math more fun
- Kept records on daily teaching and other activities

Awards and Honors

- The Luye Pharmaceutical Scholarship for Excellent Medical Students	09/2017 – 07/2018
- The CHUGAI Medical Scholarship for Excellent Medical Students	09/2016 – 07/2017
- Peking University Individual Award for Social Activities	09/2016 – 07/2017
- The Eisai (China) Pharmaceutical Scholarship for Excellent Medical Students	09/2015 – 07/2016
- Peking University Individual Award for Academic Achievement	09/2015 – 07/2016

Key Skills

Technical Skills: R, SAS, Stata, Python, SPSS

Language Skills: English (Advanced, IELTS: 7), Mandarin Chinese (Native)

Standardized Tests: GRE 323 (Verbal 154, Quant 169, Writing 3.0)