

# HE REN

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## PROFESSIONAL SUMMARY

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I have over five years of experience in psychometrics and data science, with proficiency in R and Python. My research interests focus on Item Response Theory (IRT), Differential Item Functioning (DIF), Response Time (RT), Large-Scale Assessment (LSA), and the application of machine learning and Large Language Models (LLMs) in psychometrics. I am committed to advancing interpretable and valid measurements through the use of advanced quantitative models and passionate about developing socially responsible models grounded in psychometric principles.

## EDUCATION

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06/2027    University of Washington (UW). Seattle, WA, United States  
*Expected*    **PhD Measurement & Statistics (Advisor: Chun Wang, PhD)**  
Beijing Normal University (BNU). Beijing, China  
06/2022    **MEd Psychology**  
Beijing Normal University (BNU). Beijing, China  
06/2019    **BS Statistics**

## SELECTED AWARDS/HONORS

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2024       Psychometric Society Travel Award  
2024       UW Center for Statistics and Social Sciences (CSSS) Travel Award  
2024       UW Graduate and Professional Student Senate (GPSS) Travel Grant  
2022       Outstanding Graduate of Beijing  
2021       China National Scholarship  
2020       The First Prize Scholarship of Beijing Normal University

## RESEARCH EXPERIENCE

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06/2024–    **Research Assistant**, University of Washington, Seattle, WA, United States  
09/2024    **NSF Project 2300382 HARLI: Harvesting actionable results for learning and instruction: A novel mixed methods approach to extracting and validating information from diagnostic assessment**  
*PI: Chun Wang, PhD*

- Pioneered the application of causal discovery methods to recover the facet map
- Developed and evaluated an innovative longitudinal cognitive diagnostic model
- Collaborated weekly with content experts to interpret and refine modeling results, as well as integrate feedback to improve the analytical process

09/2022–    **Research Assistant**, University of Washington, Seattle, WA, United States  
09/2024    **NIH Project 5R01AG077706-02 HOPE: Achieving home discharge for institutionally bound patients with PROMs, AI, and the HER**  
*PIs: Andrea Cheville, MD & Chun Wang, PhD*

- Cleaned a massive electronic health record (EHR) dataset with over 10 million records and conducted descriptive statistics
- Conducted a comprehensive comparison of multiple fairness metrics, bridging their statistical definitions with social context and commonly used predictive performance metrics
- Developed a prediction model that can handle a large proportion of missingness and variable selection using advanced regularization methods

06/2019–    **Research Assistant**, National Assessment Center for Education Quality, Beijing, China  
08/2019    **Chinese Testing International Co. Project: Vertical linking based on large-scale assessment projects in China**  
*PI: Ping Chen, PhD*

- Participated in the research on test equating design and methods
- Helped with programming for Monte Carlo simulation programs to compare different equating methods
- Prepared for presentation slides and posters

## TEACHING EXPERIENCE

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- 06/2023– **Statistical Consultant**, UW Center for Social Science Computation and Research, Seattle, WA, United States  
 Present Supervisor: Jerald Herting, PhD
- Conducted workshops on R Programming for faculty and students
  - Provided statistical, methodological, and computation consultation to improve the research of faculty and students
- 09/2020– **Teaching Assistant**, Beijing Normal University, Beijing, China  
 01/ 2021 Awarded as Excellent Teaching Assistant  
 Course: Adaptive testing and diagnostic adaptive assessment
- Taught R programming and tutored 18 graduate students in foundational statistics
  - Reviewed and provided feedback on weekly assignments

## INTERNSHIPS

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- 05/2022– **Psychometrician**, ByteDance Ltd., Beijing, China  
 07/2023
- Conducted descriptive statistics, data visualization, and results interpretation
  - Identified the items in which the difficulty parameters were abnormally labeled through quantitative analysis
  - Simulated item recommendation rules and adjusted the recommendation rules based on the simulation results

## PUBLICATIONS

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### PEER-REVIEWED ARTICLES

1. **Ren, H.**, Wang, C., Weiss, D., Bowles, K., Xu, G., Keeney, T., & Cheville, A. (accepted). Using machine learning to identify social determinants of health that impact discharge disposition for hospitalized patients. *Journal of the American Medical Directors Association*.
2. Parker, M.C., **Ren, H.**, Li, M., & Wang, C. (2024). Intersectional biases within an introductory computing assessment. *Proceedings of the 55th ACM Technical Symposium on Computer Science Education V. 1*, 1021–1027. <https://doi.org/10.1145/3626252.3630882>
3. Huang, Y., **Ren, H.**, & Chen, P. (2023). Item selection methods with exposure and time control for computerized classification test. *British Journal of Mathematical and Statistical Psychology*, 76(1), 52–68. <https://doi.org/10.1111/bmsp.12281>
4. Chen, P., Li, X., **Ren, H.**, & Xin, T. (2023). Influence factors of cross-test-cycles linking: A modified single group design (in Chinese). *Journal of Psychological Science*, 46(4), 960–970. <https://doi.org/10.16719/j.cnki.1671-6981.202304025>
5. **Ren, H.**, Huang, Y., & Chen, P. (2022). Types, characteristics, and application of termination rules in computerized classification testing (in Chinese). *Advances in Psychological Science*, 30(5), 1168–1182. <https://doi.org/10.3724/SP.J.1042.2022.01168>
6. **Ren, H.**, Xu, N., Lin, Y., Zhang, S., & Yang, T. (2021). Remedial teaching and learning from a cognitive diagnostic model perspective: Taking the data distribution characteristics as an example. *Frontiers in Psychology*, 12, Article 628607. <http://doi.org/10.3389/fpsyg.2021.628607>
7. **Ren, H.**, & Chen, P. (2021). Two new termination rules for multidimensional computerized classification testing (in Chinese). *Acta Psychologica Sinica*, 53(9), 1044–1058. <https://doi.org/10.3724/SP.J.1041.2021.01044>
8. **Ren, H.**, Lyu, W., Wang, C., & Xu, G. (under review). A novel method for detecting intersectional DIF: Multilevel random item effects model with regularized Gaussian variational estimation. *Psychometrika*.
9. **Ren, H.**, Wang, C., Xu, G., & Weiss, D. (under second-round review). Constructing a binary prediction model with incomplete data: Variable selection to balance fairness and precision. *Psychological Methods*.
10. **Ren, H.**, Wang, C., & Li, M. (under review). Using causal discovery to uncover attribute maps from cognitive diagnostic models: Beyond attribute hierarchy. *Journal of Educational and Behavioral Statistics*.

## **PRESENTATIONS**

11. **Ren, H.,** & Wang, C. (2025, April). *A longitudinal diagnostic facet status model: Tracking the learning trajectory*. To be presented at the Annual Meeting of the National Council on Measurement in Education (NCME), Denver, CO.
12. **Ren, H.,** Pan, Q., Zhang, Y., & Lyu, W. (2025, April). *Item reduction for digital literacy assessment: Perspectives from content-expert, psychometrics, and machine learning*. To be presented at the Annual Meeting of the National Council on Measurement in Education (NCME), Denver, CO.
13. **Ren, H.,** Lyu, W., Wang, C., & Xu, G. (2024, July). *Regularized Gaussian variational estimation for detecting intersectional differential item functioning*. Presented at the 2024 International Meeting of the Psychometric Society (IMPS), Prague, Czech Republic.
14. **Ren, H.,** & Wang, C. (2024, April). *Variable selection and binary prediction with incomplete data: Balance between fairness and precision*. Presented at the Annual Meeting of the American Educational Research Association (AERA), Philadelphia, PA.
15. **Ren, H.,** Wang, C., Li, M., & Parker, M. (2024, April). *Detecting intersectional differential item functioning: A comparison of two methods*. Presented at the Annual Meeting of the American Educational Research Association (AERA), Philadelphia, PA.
16. **Ren, H.,** Wang, C., & Sanders, E.A. (2024, April). *Modeling between- and within-person response time-response dependency: A comparison between two approaches*. Presented at the Annual Meeting of the National Council on Measurement in Education (NCME), Philadelphia, PA.
17. Huang, Y., **Ren, H.,** & Chen, P. (2022, April). *New item selection designs for computerized classification test*. Poster presented at the Annual Meeting of the National Council on Measurement in Education (NCME), San Diego, CA (Online).
18. **Ren, H.,** & Chen, P. (2020, April). *Research on termination rules of multidimensional computerized classification testing*. Poster presented at the Annual Meeting of the National Council on Measurement in Education (NCME), Online.
19. **Ren, H.** (2025, February). *Using AI to Help Program/Code in R*. Workshop at Center for Social Science Computation and Research, University of Washington, Seattle, WA.
20. **Ren, H.** (2024, March). *Introduction to Pytorch*. Workshop at Measurement & Statistics Seminar, University of Washington, Seattle, WA.
21. **Ren, H.** (2024, January). *Introduction to R*. Workshop at Center for Social Science Computation and Research, University of Washington, Seattle, WA.
22. **Ren, H.** (2023, October). *Introduction to R*. Workshop at Center for Social Science Computation and Research, University of Washington, Seattle, WA.

## **SERVICE**

### **REVIEWER**

2025–Now	Journal of Educational and Behavioral Statistics
2022–Now	Journal of Educational Measurement
2023, 2024	National Council on Measurement in Education (NCME) Annual Meeting
2023, 2024	American Educational Research Association (AERA) Annual Meeting
2023, 2024	ACM Technical Symposium on Computer Science Education (SIGCSE)

### **COMMITTEE MEMBER**

2023–2024	Committee of NCME Brenda Loyd Outstanding Dissertation Award (Student Member)
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