PANPAN ZHANG

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Education

George Washington University, Washington, DC
Ph.D. in Statistics, May 2016
Dissertation: On properties of several random networks
Advisor: Hosam M. Mahmoud

Wake Forest University, Winston-Salem, NC
M.A. in Mathematics, May 2012
Thesis: Statistical self-similarity in time series from financial data & chaotic dynamical systems
Advisor: Miaohua Jiang

Professional Experiences

- **Postdoctoral Researcher,** Department of Biostatistics, Epidemiology and Informatics (DBEI), Perelman School of Medicine, University of Pennsylvania, Philadelphia, PA 19104, August 2018 – present.
  Mentor: Sharon X. Xie (Sharon Xie Lab)
- **Visiting Assistant Professor,** Department of Statistics, University of Connecticut, Storrs, CT 06029, August 2016 – August 2018.
- **Graduate Instructor,** Department of Statistics, The George Washington University, Washington, DC 20052, May 2015 – May 2016.
- **Graduate Teaching Assistant,** Department of Statistics, The George Washington University, Washington, DC 20052, January 2013 – May 2015.
- **Teaching Assistant,** Department of Mathematics & Statistics, Wake Forest University, Winston-Salem, NC 27109, September 2010 – May 2012.

Editorial Services

- **Associate editor,** Journal of Data Science, 2020 – present.
- **Guest editor,** "Advances in Network Data Science", Journal of Data Science, 2021.

Research

- Biostatistics
  - Longitudinal data analysis
  - Missing data
  - Applications to Alzheimer's disease, Parkinson's disease and other neurodegenerative disorders
- Network data analysis
  - Random network models
  - Community detection algorithms
  - Network data inference
- High-dimensional data analysis

- Bayesian analysis
- Combinatorial probability
- Analytical techniques for the analysis of algorithms and data structure

Refereed Journal Publications

1. Weinshel, S., Irvin, D. J., **Zhang, P.**, Weintraub, D., Shaw, L. M., Siderowf, A. and Xie, S. X.* (2022). Appropriateness of applying CSF biomarker cutoffs from Alzheimer's disease to Parkinson's disease. *Journal of Parkinson's Disease* (in press). DOI
2. Chen, J. and **Zhang, P.*** (2022). Clustering US states by time series of COVID-19 new case counts with non-negative matrix factorization. *Journal of Data Science*, **20**, 79–94. DOI
3. **Zhang, P.*** (2022). The Zagreb index of several random models. *Journal of Stochastic Analysis*, **3**, 1. DOI
4. Li, X., **Zhang, P.*** and Feng, Q. (2022). Exploring COVID-19 in Mainland China during the lockdown of Wuhan via functional data analysis. *Communications for Statistical Applications and Methods*, **29**, 103–125. DOI
5. Wang, T.* and **Zhang, P.** (2022). Directed hybrid random networks mixing preferential attachment with uniform attachment mechanisms. *Annals of the Institute of Statistical Mathematics* (in press). DOI
6. **Zhang, P.***, Wang, T. and Yan, J. (2022). PageRank centrality and algorithms for weighted, directed networks. *Physica A: Statistical Mechanics and its Applications*, **586**, 126438. DOI
7. Ren, Y., **Zhang, P.*** and Dey, D. K. (2022). Investigating several fundamental properties of random lobster trees and random spider trees. *Methodology and Computing in Applied Probability*, **24**, 431–447. MR4379497 DOI
8. **Zhang, P.*** and Wang, X. (2021). Several topological indices of random caterpillars. *Methodology and Computing in Applied Probability* (available online). DOI
9. Tang, C., Wang, T. and **Zhang, P.*** (2021+). Functional data analysis: An application to COVID-19 data in the United States. *Quantitative Biology* (in press). ArXiv **(joint first authorship)**
10. Wang, T., Xiao, S., Yan, J. and **Zhang, P.*** (2021). Regional and sectoral structures and their dynamics of Chinese economy: A network perspective from multi-regional input-output tables. *Physica A: Statistical Mechanics and its Applications*, **581**, 126196. DOI
11. Yuan, Y., Yan, J. and **Zhang, P.*** (2021). Assortativity measures for weighted and directed networks. *Journal of Complex Networks*, **9**, cnab017. MR4266155 DOI
12. Galarza, C. E., **Zhang, P.** and Lachos, V. H.* (2021). Logistic quantile regression for bounded outcomes using a family of heavy-tailed distributions. *Sankhya B*, **83**, 325–349. MR4332185 DOI
13. **Zhang, P.*** (2020). Characterizing several properties of high-dimensional random Apollonian networks. *Journal of Complex Networks*, **8**, cnaa038. MR4189631 DOI
14. **Zhang, P.***, Wang, T. and Xie, S. X. (2020). Meta-analysis of several epidemic characteristics of COVID-19. *Journal of Data Science*, **18**, 536–549. DOI PubMed
15. Robinson, J. L., Porta, S., Garrett, F. G., **Zhang, P.**, Xie, S. X., Sun, E., Van Deerlin, V. M., Abner, E. L., Jicha, G. A., Barber, J. M., Lee, V. M.-Y., Lee, E. B., Trojanowski, J. Q. and Nelson, P. T.* (2020). Limbic-predominant age-related TDP-43 encephalopathy differs from frontotemporal lobar degeneration. *Brain*, **143**, 2844–2857. DOI PubMed
16. **Zhang, P.*** (2020). On several properties of a class of preferential attachment trees—plane-oriented recursive trees. *Probability in Engineering and Informational Sciences*, **35**, 839–857. MR4320478 DOI

17. Mahmoud, H. M. and **Zhang, P.*** (2020). Distributions in the constant-differentials Pólya process. *Statistics & Probability Letters*, **156**, 108592. MR3996837 DOI

18. **Zhang, P.*** and Mahmoud, H. M. (2020). On nodes of small degrees and degree profile in preferential dynamic attachment circuits. *Methodology and Computing in Applied Probability*, **22**, 625–645. MR4104007 DOI

19. Ouyang, G., Dey, D. K. and **Zhang, P.*** (2020). Clique-based method for social network clustering. *Journal of Classification*, **37**, 254–274. MR4111894 DOI

20. **Zhang, P.*** and Dey, D. K. (2019). The degree profile and Gini index of random caterpillar trees. *Probability in Engineering and Informational Sciences*, **33**, 511–527. MR4010508 DOI

21. Chen, C. and **Zhang, P.*** (2019). Characterizations of asymptotic distributions of continuous-time Pólya processes. *Communications in Statistics—Theory and Methods*, **48**, 5308–5321. MR4007715 DOI

22. **Zhang, P.*** and Mahmoud, H. M. (2016). The degree profile and weight in Apollonian networks and k-trees. *Advances in Applied Probability*, **48**, 163–175. MR3473572 DOI

23. **Zhang, P.*** and Mahmoud, H. M. (2016). Distributions in a class of Poissonized urns with an application to Apollonian networks. *Statistics & Probability Letters*, **115**, 1–7. MR3498362 DOI

24. **Zhang, P.***, Chen, C. and Mahmoud, H. M. (2015). Explicit characterization of moments of balanced triangular Pólya urns by an elementary approach. *Statistics & Probability Letters*, **96**, 149–153. MR3281759 DOI

Peer-reviewed Conference Proceedings

1. **Zhang, P.*** (2016). On terminal nodes and the degree profile of preferential dynamic attachment circuits. In *Proceedings of SIAM: Thirteenth Workshop on Analytic Algorithmics and Combinatorics (ANALCO 16)*, 80–92. Arlington, VA. MR3480250 DOI

Book Chapters

1. **Zhang, P.*** and Glaz, J. (2018). "Scan Statistics on Graphs and Networks." In: Glaz, J. and Koutras, M. (Eds.) *Handbook of Scan Statistics*, 1–36. Springer, New York, NY. DOI

Software

1. Yan, J., Yuan, Y. and **Zhang, P.*** (2020). wdnet: Weighted Directed Network. `R` package version 0.0-3, `https://githlab.com/wdnetwork/wdnet`.

Preprints

1. Mechanic-Hamilton, D.*, Lydon, S., Xie, S. X., **Zhang, P.**, Miller, A., Rascovsky, K. Rhodes, E. and Massimo, L. (2022+). Turning apathy in to action in neurodegenerative disease: Development of a goal-directed behavior app.

2. Wang, T., Yan, J., Yuan, Y. and **Zhang, P.*** (2022+). An efficient algorithm for generating directed networks with predetermined assortativity measures. ArXiv

3. Ouyang, G., Dey, D. K. and **Zhang, P.*** (2021+). Model-based method for social network clustering. ArXiv

Manuscripts in Preparation

1. **Zhang, P.** and Xie, S. X.* (2022+). An efficient approach for handling missing data in nonlinear longitudinal models.
2. Suttner, L. H., **Zhang, P.** and Xie, S. X.* (2022+). Nonparametric estimation for time-varying missing covariates in longitudinal models. **(co-first authorship: Suttner, L. H. and Zhang, P.)**
3. **Zhang, P.** and Xie, S. X.* (2022+). Bias and efficiency comparison between multiple imputation of missing data and available-case analysis in longitudinal studies.
4. Dolui, S.*, Tisdall, M. D., Vidorreta, M., Nasrallah, I. M., Habes, M., **Zhang, P.**, Davatzokos, C., Xie, S. X., Wolk, D. A. and Detre, J. A. (2022+). Cerebral microvascular perfusion as a biomarker of cerebral small vessel function.

(∗ refers to the corresponding author)

(† refers to my students, postdocs or trainees)

Presentations

1. Invited speaker at the Brown Bag Forum (organized by DBEI at Penn Medicine), online, 2022.
2. Invited speaker at the Applied Mathematics Webinar (jointly sponsored by Imam Abdulrahman Bin Faisal University, King Saud University, Université de Tunis EI Manar and University of Jeddah), online, 2022.
3. Guided poster presenter at the MDS Virtual Congress 2021 (sponsored by International Parkinson and Movement Disorder Society), online, 2021.
4. Invited speaker at the School of Statistics Seminar, Renmin University of China, online, 2021.
5. Contributed speaker at the spring meeting of the Eastern North American Region (ENAR 2021), online, 2021.
6. Invited speaker at the Brown Bag Forum (organized by DBEI at Penn Medicine), online, 2021.
7. Invited speaker at Data Science in Action in Response to the Outbreak of COVID-19 (jointly sponsored by Korean FDA and Korean Region of International Biometric Society), online, 2020.
8. Contributed speaker at the Joint Statistical Meeting (JSM 2020), online, 2020.
9. Invited speaker and short course instructor at the Virtual Conference on Data Science in Action (organized by Shanxi University of Finance and Economics), online, 2020.
10. Invited speaker at the New England Statistical Symposium (NESS 2019), Hartford, CT, 2019.
11. Invited speaker at the International Workshop of on Applied Probability (IWAP 18), Budapest, Hungary, 2018.
12. Poster presenter at the SouthEastern Probability Conference, Duke University, Durham, NC, 2017.
13. Invited speaker at the Statistics Colloquium, University of Connecticut, Storrs, CT, 2016.
14. Invited speaker at the 13$^{\text{th}}$ Workshop on Analytic Algorithmics and Combinatorics (ANALCO 16), Arlington, VA, 2016.
15. Contributed speaker at the 11$^{\text{th}}$ Annual UNCG Regional Mathematics and Statistics Conference, University of North Carolina at Greensboro, Greensboro, NC, 2015.
16. Invited speaker at the Mathematics Department Colloquium, Wake Forest University, Winston Salem, NC, 2015.
17. Contributed speaker at the 9$^{\text{th}}$ Annual Probability & Statistics Day, University of Maryland, Baltimore County, Baltimore, MD, 2015.
18. Invited speaker at the Seminar in Probability, The Catholic University of America, Washington, DC, 2015.

19. Invited speaker at the GWU STAT Student Seminar, The George Washington University, Washington, DC, 2014.
20. Invited speaker at the Probability Seminar, The George Washington University, Washington, DC, 2014.
21. Poster presenter at the 12^{th} Graduate Student and Postdoctoral Research Day, Wake Forest University, Winston Salem, NC, 2012.

Teaching

- University of Connecticut
  1. Mathematical Statistics I (STAT 3375Q) (Fall 2016/2017, Spring 2018)
  2. Mathematical Statistics II (STAT 3445Q) (Spring 2017)
  3. Introduction to Statistics II (STAT 2215Q) (Spring 2018)
- The George Washington University
  1. Introduction to Statistics in Social Science (STAT 1053) (Summer 2015)
  2. Introduction to Business and Economic Statistics (STAT 1051) (Fall 2016, Spring 2017)

Other Services

Conference Organization Services

1. Program committee, New England Statistical Symposium (NESS 2022), Storrs, CT, 2022.
2. Student paper committee, New England Statistical Symposium (NESS 2019), Hartford, CT, 2019.

Journal Article Review Services (in alphabetic order)

1. Annals of the Institute of Statistical Mathematics
2. Applied Artificial Intelligence
3. Applied Probability Trust
   - Advances in Applied Probability
   - Journal of Applied Probability
4. Communications in Statistics—Theory and Methods
5. Contemporary Clinical Trials Communications
6. Environmental and Ecological Statistics
7. Epidemiology & Infection
8. Journal of Alzheimer's Disease
9. Journal of Applied Statistics
10. Journal of Computational Science
11. Journal of Data Science
12. Methodology and Computing in Applied Probability
13. Physica A: Statistical Mechanics and its Applications
14. Probability in Engineering and Informational Sciences
15. Random Structure & Algorithms

16. Statistics and Its Interface
17. Statistics & Probability Letters

Awards

1. **Excellence in Teaching Award,** University of Connecticut, Storrs, CT, Fall 2017 and Spring 2018.
2. **Kullback Award,** The George Washington University, Washington, DC, 2016.
3. **Washington Statistical Society's Outstanding Graduate Student Award,** Washington Statistical Society, Washington, DC, 2015.
4. **First Prize,** Graduate Student Oral Presentations, the 9^{th} Annual Probability & Statistics Day, University of Maryland, Baltimore County, Baltimore, MD, 2015.