Kehui Chen

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Education

- Ph.D. in Statistics, University of California, Davis, CA, 2012.
- B.S. in Probability and Statistics, Peking University, Beijing, China, 2007.

Employment

- Professor, Department of Statistics, University of Pittsburgh, September 2024 - present.
- Associate Professor, Department of Statistics, University of Pittsburgh, September 2018 - August 2024.
- Graduate Director, Department of Statistics, University of Pittsburgh, May 2018 - present.
- Assistant Professor, Department of Statistics, University of Pittsburgh, August 2012 - August 2018.
- Assistant Professor, Department of Psychiatry, University of Pittsburgh, August 2012 - August 2018.
- Statistician, Google Inc., June 2010–Sep 2010 (Summer Internship).

Research Interests

My statistical methodological work focuses on functional data analysis and network modeding. Recently, my research has centered on modeling the variance and covariance structures of complex functional data and network data, as well as nonparametric prediction for functional data, relational-data and survival outcomes.

My applied work focuses on statistical methods in mental health studies, including translational neuroscience in schizophrenia studies and biomarker identification and prediction in suicide studies.

Publications

Peer Reviewed Journals

1. H. Moon and **K. Chen** (2024+) "Frequent-voting independence screening for data of different types or different dimensions," to appear in *Statistica Sinica*.

2. J. Lu and **K. Chen** (2024) "A Zero-imputation approach in recommendation systems with data missing heterogeneously," *Statistica Sinica*, **34**, 421-438.

3. B. Thoma, E. Hone, A. Roig, E. Goodfriend, E. Jardas, B. Brummitt, S. Riston, D. Sakolsky, J. Zelazny, A. Marsland, **K. Chen**, A. Douaihy, D. Brent, N. Melhem (2023) "Risk for suicidal behavior after psychiatric hospitalization among sexual and gender minority patients," *JAMA Network Open*, **6**(9).

4. H. Moon and **K. Chen** (2022) "Interpoint-ranking sign covariance for the test of independence," *Biometrika*, **109**(1), 165-179.

5. S. Kimoto, T. Hashimoto, K. Berry, M. Tsubomoto, Y. Yamaguchi, J. Enwright, **K. Chen**, R. Kawabata, M. Kikuchi, T. Kishimoto, and D. Lewis (2022) "Expression of actin-and oxidative phosphorylation-related transcripts across the cortical visuospatial working memory network in unaffected comparison and schizophrenia subjects", *Neuropsychopharmacology*, 1-10.

6. R. Kelly and **K. Chen** (2022) "Distribution free prediction intervals for multiple functional regression," *Statistics and Its Interface*, **15**(2), 161-170.

7. A. Zhang and **K. Chen** (2022) "Nonparametric covariance estimation for mixed longitudinal studies, with applications in midlife women's health," *Statistica Sinica*, **32**(1), 345-366.

8. G. Hoftman, H. Bazmi, A. Ciesielski, L. Dinka, **K. Chen** , D. Lewis (2021)"Postnatal development of glutamate and GABA transcript expression in monkey visual, parietal and prefrontal cortices," *Cerebral Cortex*, **31**(4), 2026-2037.

9. M. Rengasamy, Y. Zhong, A. Marsland, **K. Chen**, A. Douaihy, D. Brent, and N. Melhem (2020)"Signaling networks in inflammatory pathways and risk for suicidal behavior," *Brain, Behavior, & Immunity - Health*, **7**, 100-122.

10. J. Lei, **K. Chen** , B. Lynch (2020) "Consistent community detection in multi-layer network data," *Biometrika*, **107**(1), 61-73.

11. J. Glausier, M. Kelly, S. Salem, **K. Chen** D. A. Lewis (2020) "Proxy measures of premortem cognitive aptitude in postmortem subjects with schizophrenia psychological medicine," *Psychological Medicine*, 1-8.

12. I. Ibrahim, S. Tobar, W. Fathi, H. Elsayed, A. Yassein, A. Eissa, E. Elsheshtawy, H. Elboraei, M. Shahda, M. Elwasify , A. Ali, **K. Chen** J. Wood, F. Dickerson, R. Yolken, F. Chennawi, R. Gur, R. Gur, W. Bahaey, V. Nimgaonkar and H. Mansour (2019) " Randomized controlled trial of adjunctive Valproate for cognitive remediation in early course schizophrenia, " *Journal of Psychiatric Research*, **118**, 66-72.

13. Y. Zhang, **K. Chen**, A. Sampson, K. Hwang and B. Luna (2019), "Node features adjusted stochastic block model," *Journal of Computational and Graphical Statistics*, **28**(2), 362-373.

14. H. Zhu, **K. Chen**, X. Luo, Y. Yuan and J.L. Wang (2019), "FMPM: Functional mixed processes models for longitudinal functional responses," *Statistica Sinica*, **29**(4), 2007-2033.

15. M. Tsubomoto, R. Kawabata, X. Zhu, Y. Minabe, **K. Chen** D. A. Lewis, T. Hashimoto (2019), "Expression of transcripts selective for GABA neuron subpopulations across the cortical visuospatial working memory network in the healthy state and schizophrenia," *Cerebral Cortex*, **29**(8), 35403550.

16. B. Lynch and **K. Chen** (2018), "A test of weak separability for multi-way functional data, with application to brain connectivity studies," *Biometrika*, **105**(4), 815-831.

17. G. Hoftman, S. Dienel, H. Bazmi, Y. Zhang, **K. Chen** and D. Lewis (2018), "Altered gradients of glutamate and GABA transcripts in the cortical visuospatial working memory network in schizophrenia," *Biological Psychiatry*, **83**(8), 670-679.

18. T. Bhatia, J. Wood, S. Iyengar, S. Narayanan, K. Prasad, **K. Chen**, R. Yolken, F. Dickerson, R Gur, R. Gur, S. Deshpande and V. Nimgaonkar (2018), "Emotion discrimination in humans: its association with HSV-1 infection and its improvement with antiviral treatment Schizophrenia Research," *Schizophrenia Research*, **193**, 161167.

19. T. Miyamae, **K. Chen**, D.A. Lewis and G.G. Burgos (2017), "Distinct physiological maturation of parvalbumin neuron subtypes in mouse prefrontal cortex," *Journal of Neuroscience*, **37**(19), 4883-4902.

20. **K. Chen** and J. Lei (2017), "Network cross-validation for determining number of communities in network data," *Journal of the American Statistical Association*, **113**(521), 241-251.

21. **K. Chen**, Y. Cheng, O. Berkout and O. Lindhiem (2016), "Analyzing proportion scores as outcomes for prevention trials: a statistical primer," *Prevention Science*, 1-10.

22. **K. Chen**, P. Delicado and H.G. Müller (2016), "Modeling function-valued stochastic processes, with applications to fertility dynamics," *Journal of the Royal Statistical Society B*, **79**(1), 177-196.

23. **K. Chen**, X. Zhang, A. Petersen and H.G. Müller (2015), "Quantifying infinite-dimensional data: functional data analysis in action," *Statistics in Biosciences, special edition on Big Data*, 1-23.

24. I. Ibrahim, S. Tobar, M. Elassy, H. Mansour, **K. Chen**, J. Wood, R. Gur, R. Gur, W. El Bahaei and V. Nimgaonkar (2015), "Practice effects distort translational validity estimates for a neurocognitive battery," *Journal of Clinical and Experimental Neuropsychology*, **37**(5), 530-7.

25. **K. Chen** and J. Lei (2015), "Localized functional principal component analysis," *Journal of the American Statistical Association*, **110**, 1266-1275.

26. J. Harwood, **K. Chen**, P. Liedo, H.G. Müller, J.L. Wang, A.E. Morice and J. Carey (2015), "Effects of female access and diet on insemination success, senescence, and the cost of reproduction in male Mexican fruit flies (Anastrepha ludens)," *Physiological Entomology*, **40**(1), 65-71.

27. Y. Yuan, J. Gilmore, X. Geng, S. Martin, **K. Chen**, J.L. Wang and H. Zhu (2014), "FMEM: Functional mixed effects modeling for analysis of longitudinal white matter tract data," *Neuroimage*, **84**, 753-764.

28. **K. Chen** and H.G. Müller (2014), "Modeling conditional distributions for functional responses, with application to traffic monitoring via GPS-enabled mobile phones," *Technometrics*, **56**(3), 347-358.

29. J. Harwood, **K. Chen**, H.G. Müller, J.L. Wang, R. Vargas and J. Carey (2013), "Effects of diet and host access on reproduction and lifespan in two fruit fly species with different life history patterns," *Physiological Entomology*, **38**(1), 81-88.

30. **K. Chen** and H.G. Müller (2012), "Modeling repeated functional observations," *Journal of the American Statistical Association*, **107**, 1599-1609.

31. A.J. Clifford, **K. Chen**, L. McWade, G. Rincon, S. Kim, D.M. Holstege, J.E. Owens, B. Liu, H.G. Müller, J.F. Medrano, J.G. Fadel, A.J. Moshfegh, D.J. Baer and J.A. Novotny (2012), "Gender and single nucleotide polymorphisms in MTHFR, BHMT, SPTLC1, CRBP2, CETP, and SCARB1 are significant predictors of plasma homocysteine normalized by RBC folate in healthy adults," *Journal of Nutrition*, **142**, 1764-71.

32. **K. Chen** and H.G. Müller (2012), "Conditional quantile analysis when covariates are functions, with application to growth data," *Journal of the Royal Statistical Society B*, **74**(1), 67-89.

33. K. Chen, **K. Chen**, H.G. Müller and J.L. Wang (2011), "Stringing high-dimensional data for functional analysis," *Journal of the American Statistical Association*, **106**, 275-284.

Editorial Board

- Associate Editor: *Annals of Applied Statistics*, 2024 - present.
- Associate Editor: *Statistica Sinica*, 2017 - present.
- Associate Editor: *Journal of Multivariate Analysis*, 2018 - 2019.

Research Grants

Current

- NIH R01MD018582 08/2024 - 04/2029 Co-Investigator (PI: Thoma),
"Psychosocial Predictors of Risk for Suicidal Behavior among Gender Minority Adolescents."
- NIH R01MH135488 09/2023 - 07/2028 Co-Investigator (PI: Melhem),
"Bidirectional Influences Between Adolescent Social Media Use and Mental Health."
- NIH R01MH134487 07/2023 - 06/2028 Co-Investigator (PI: Melhem),
"COVID-19, Inflammation and HPA axis activity, and Risk for Psychopathology in Youth."
- NSF DMS2210402 08/2022 - 07/2025 Principal Investigator
"Modeling and Inference for Data with Network Dependency."
- NIH R01MH124266 09/2020 - 06/2025 Co-Investigator (PI: Perlman and Melhem),
"Biological Substrates Of Maladaptive Stress Response In Early Childhood."
- NIH R01MH108039 12/2021 - 10/2026 Co-Investigator (PI: Melhem),
"Inflammation and Stress Response in Familial and Nonfamilial Youth Suicidal Behavior."

Completed

- NIH R01MH112585 04/2017- 03/2022 Co-Investigator (PI: Melhem),
"Biomarkers in the HPA Axis and Inflammatory Pathways for Maladaptive Stress Response in Children."
- NIH R01MH109493 12/2016 - 11/2021 Co-Investigator (PI: Melhem),
"Biological Predictors in the HPA Axis and Inflammatory Pathways for Suicidal Behavior in Young Adults."
- NIH R01MH043784 04/2019 - 06/2021 Co-Investigator (PI: Lewis),
"Prefrontal microcircuitry and cognition in schizophrenia"
- NIH R01MH051234 09/2016 - 06/2021 Co-Investigator (PI: Lewis),
"Schizophrenia and Synaptic Pruning: Circuit Specificity and Functional Consequences."
- NSF 1612458 07/2016 - 06/2019 Principal Investigator,
"New Inference Methods for Multiway Functional Data and Multilayer Network Data."

- NIH P50MH103204 04/2014 - 03/2019 Stat and Data Management Core (PI: Lewis), "Cortical Cells, Circuits, Connectivity and Cognition in Schizophrenia."
- Stanley Foundation 04/2012 - 03/2017 Co-Investigator (PI: Mansour), " Replicate Study of Valacyclovir for Cognitive Remediation in Schizophrenia."
- Stanley Foundation 04/2012 - 08/2016 Co-Investigator (PI: Nimgaonkar), "Pilot Trial of Sodium Valproate as Adjunctive Treatment for Toxoplasma Gondi Infection in Early Course Schizophrenia."
- PA state grant 09/2012 - 05/2015 Co-Investigator (PI: Lewis), "Reducing the Cognitive Consequences of Cannabis Use by Adolescents."

Teaching and Advising

Courses

- STAT 2381 Supervised Statistical Consulting.
  Spring 2021, Spring 2022, Spring 2023, Fall 2023, Spring 2024, Fall 2024
- STAT 2131 Applied Statistical Methods I.
  Fall 2012, Fall 2013, Fall 2016, Fall 2017, Fall 2021, Fall 2022
- STAT 2132 Applied Statistical Methods II.
  Spring 2016, Spring 2018, Spring 2019.
- STAT 1000 Applied Statistical Methods (received dB-SERC Course Transformation Award).
  Fall 2015.
- STAT 1211/2100 Applied Categorical Data Analysis.
  Fall 2012.

Doctoral Dissertation Advising

- Jiashen Lu (2022): "Nonparametric Predictions for Network Links and Recommendation Systems."
- Haeun Moon (2022): "A New Test of Independence and Its Application to Variable Selection."
- Ryan Kelly (2020): "Distribution Free Prediction Intervals for Multiple Functional Regression."
- Brian Lynch (2018): "Analysis of multi-way functional data under weak separability, with application to brain functional connectivity studies."
- Qiyao Wang (2017): "Two sample inference and change-point detection for sparse functional data."
- Yun Zhang (2016), co-advised with Dr. Allan Sampson: "Cluster analysis and community detection with application to neuroscience."

Conference and Seminar Presentations

Invited Talks

- Joint Conference on Statistics and Data Science in China (JCSDS), Kunming, China, Jul 11- 13, 2024.
- Econometrics and Statistics (EcoStat) virtual, Aug 1- 3, 2023.

- Joint Conference on Statistics and Data Science in China (JCSDS), Beijing, China, Jul 11- 13, 2023.
- ICSA China Conference, Chengdu, China, Jun 30 - Jul 3, 2023.
- International Symposium On Nonparametric Statistics (ISNPS), Paphos, Cyprus, Jun 20 - 22, 2022.
- WNAR/IMS/JR Annual Meeting, Virtual, June 13 - 15, 2022.
- Joint Statistical Meetings, Virtual, Aug 7 - 12, 2021.
- CFE-CMStatistics Meeting, Virtual, Dec 19 - 21, 2020.
- Workshop on Multivariate Data Analysis (CRoNoS & MDA), Limassol, Cyprus, Apr 14 - 16, 2019.
- ICSA China Conference, Qingdao, Shandong, China, Jul 2 - 5, 2018.
- SLDS/Nonparametric Statistics conference, NYC, NY, Jun 4 - 6, 2018.
- ENAR Spring Meeting, Atlanta, GA, Mar 25 - 28, 2018.
- CFE-CMStatistics Meeting, London, UK, Dec 16 - 18, 2017.
- CFE-CMStatistics Meeting, Seville, Spain, Dec 9- 12, 2016.
- Nonparametric Workshop, Ann Arbor, MI, Oct 6 - 7, 2016.
- Joint Statistical Meetings, Seattle, WA, Aug 8 - 13, 2015.
- BIRS, Frontiers in Functional Data Analysis, Banff, Alberta, Canada, Jun 28 - Jul 3, 2015.
- ICSA Applied Statistics Symposium and Graybill Conference , Fort Collins, CO, Jun 14 - 17, 2015.
- Informs Annual Meeting, San Francisco, CA, Nov 9- Nov 12, 2014.
- Joint Statistical Meetings, San Diego, CA, Jul 28-Aug 2, 2012 .
- Joint Statistical Meetings, Vancouver, Canada, Jul 31-Aug 5, 2010.

Seminars

- Department of Statistics, Texas A&M University, Virtual, Oct 9, 2020.
- Statistics Department, University of Illinois Urbana-Champaign, Champaign, IL, Oct 10, 2019.
- Biostatistics Department, University of Pennsylvania, Philadelphia, PA, Nov 29 2016.
- Laboratory of Neurocognitive Development, Pittsburgh, PA, Apr 16, 2015.
- Biostatistics Department, University of Pittsburgh, Pittsburgh, PA, Sep 27, 2012.
- Statistics Department, Penn State University, State College, PA, Feb 20, 2012.
- Statistics Department, University of Pittsburgh, Pittsburgh, PA, Feb 13, 2012.
- Department of Statistics and Actuarial Science, University of Iowa, Iowa City, IA, Feb 9, 2012.
- Statistics Department, Ohio State University, Columbus, OH, Jan 31, 2012.
- Statistics Department, North Carolina State University, Raleigh, NC, Jan 27, 2012.

Contributed Talks

- The 27th Workshop in Matrices and Statistics, Shanghai, China, Jun 6 - Jun 9, 2019.
- IMS China, Chengdu, China, Jun 30 - Jul 4, 2013.
- The 14th Meeting of New Researchers in Statistics and Probability , University of California, San

Diego, CA, Jul, 2012.

- Workshop on Analysis of High-Dimensional and Functional Data in Honor of Peter Hall on the occasion of his 60th birthday, University of California, Davis, CA, May, 2012.

Professional Service

- President Elect, President, Past President of American Statistical Association Pittsburgh Chapter, 2020 - 2022.
- University of Pittsburgh Kenneth P. Dietrich School of Arts and Sciences, Tenure Council and Selection Committee, 2021 - present.
- University of Pittsburgh Kenneth P. Dietrich School of Arts and Sciences, Graduate Council, 2021 - 2023.
- University of Pittsburgh Kenneth P. Dietrich School of Arts and Sciences, faculty diversity committee, 2019 - 2021.

Professional Memberships

- Institute of Mathematical Statistics, 2009-present.
- American Statistical Association, 2009-present.
- International Chinese Statistical Association, 2013 - present.
- Center for the Neural Basis of Cognition (CNBC) faculty, 2015 - present.