Subhadeep Paul

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Experience

2017–Present **The Ohio State University**, *Department of Statistics*, Columbus, Ohio.
- Associate Professor of Statistics (with tenure), 2023–Present
- Co-director of Community of Practice on Foundations of Data Science and AI, Translational Data Analytics Institute, 2022–present
- Assistant Professor of Statistics, 2017–2023.
- Faculty member, Interdisciplinary PhD program in Biostatistics, 2017–Present.

Education

2012–2017 **Ph.D. in Statistics**, *Unversity of Illinois at Urbana-Champaign*, IL.
Advisor: Professor Yuguo Chen
Dissertation: Consistent community detection in uni-layer and multi-layer networks

2007–2012 **Master of Science and Bachelor of Science (Honours) in Statistics and Informatics**, *Indian Institute of Technology*, Kharagpur, India.

Publications

A * after an author's name indicates the author was a student when the work was done.

Published Work

1. **Paul, S.**, Milenkovic, O., Chen, Y. (2023). Higher-Order Spectral Clustering under Superimposed Stochastic Block Model. ***Journal of Machine Learning Research.***.

2. Wang, S. S.*, **Paul, S.**, De Boeck, P., (2023). Joint Latent Space Model for Social Networks with Multivariate Attributes. ***Psychometrika,*** 1-31.

3. Soliman, H.*, Zhao, L.*, Huang, Z.*, **Paul, S.,** Xu, K. (2022). The Multivariate Community Hawkes Model for Dependent Relational Events in Continuous-time Networks. ***International Conference on Machine Learning (ICML 2022).*** PMLR 162 (pp. 20329-20346).

4. Huang, Z.*, Soliman, H.*, **Paul, S.,** Xu, K. (2022). A Mutually Exciting Latent Space Hawkes Process Model for Continuous-time Networks. ***Conference on Uncertainty in Artificial Intelligence (UAI 2022).*** PMLR Volume 180 (pp. 863-873).

5. **Paul, S.**, Chen, Y. (2022). Null models and community detection in multi-layer networks. ***Sankhya A***, 84 (1), 163-217.

6. Minich, D., Madden, C., Navarro, M., Glowacki, L.*, French-Kim, K., Chan, W., Evans, M., Soares, K., Mrofchak, E., Madan, R., Ballash, G., LaPerle, K., **Paul, S.**, Vodovotz, Y., Uzal, F., Martinez, M., Hausmann, J., Junge, R., Hale V., (2022). Gut microbiota and age shape susceptibility to clostridial enteritis in lorikeets under human care. ***Animal Microbiome*** volume 4, Article number: 7.

7. Nicol, P. B.*, Coombes, K. R., Deaver, C., Chkrebtii, O. A., **Paul, S.**, Toland, A. E., Asiaee, A. (2021). Oncogenetic Network Estimation with Disjunctive Bayesian Networks: Learning from Unstratified Samples while Preserving Mutual Exclusivity Relations. ***Computational and Systems Oncology,*** 1(2), e1027.

8. **Paul, S.**, Chen, Y. (2020). Spectral and matrix factorization methods for consistent community detection in multi-layer networks. ***The Annals of Statistics***, 48 (1), 230-250.

9. **Paul, S.**, Chen, Y. (2020). A random effects stochastic block model for joint community detection in multiple networks with applications to neuroimaging. ***The Annals of Applied Statistics***, Volume 14, Number 2, pages 993-1029.

10. Arastuie M.*, **Paul S.**, Xu K.(2020). CHIP: A hawkes process model for continuous-time networks with scalable and consistent estimation. ***Advances in Neural Information Processing Systems (NeurIPS 2020)***, Vol 33 (pp. 16983-16996).

11. Howard-Varona, C., Lindback, M., Bastien, G., Solonenko, N., Zayed, A., Jang, H.B., Andreopoulos, B., Brewer, H., Glavina del Rio, T., Adkins, J., **Paul, S.**, Sullivan, M.B., Duhaime, M. (2020). Phage-specific metabolic reprogramming of virocells. ***The ISME Journal***, 14 (4), 881-895.

12. Zimmerman, B.J., Finnegan, M.K., **Paul, S.**, Schmidt, S.A., Tai, Y., Roth, K.A., Chen, Y. and Husain, F.T. (2019). Functional Brain Changes During Mindfulness-Based Cognitive Therapy Associated with Tinnitus Severity. ***Frontiers in Neuroscience***, 13, p.747.

13. **Paul, S.**, Chen, Y. (2016). Consistent community detection in multi-relational data with restricted multi-layer stochastic blockmodel. ***Electronic Journal of Statistics***, vol. **10**, no. 2, 3807–3870.

14. **Paul, S.**, Basu, A. (2015). On second order efficient robust inference. ***Computational Statistics and Data Analysis***, **88C**, 187-207.

15. Kiviniemi T.O., Yegutkin G.G., Toikka J.O., **Paul S.**, Aittokallio T., Janatuinen T., Knuuti J., Rönnemaa T., Koskenvuo J.W., Hartiala J.J., Jalkanen S., Raitakari O.T. (2012). Pravastatin-induced improvement in coronary reactivity and circulating ATP and ADP levels in young adults with type 1 diabetes. ***Frontiers in Physiology***, **3**, 338.

Submitted work and Preprints

16. Lovekar K.*, Sengupta, S., **Paul, S.**, (2023). Testing for the network small-world property. ***Submitted***. ***Preprint at arXiv:2103.08035***.

17. Nath, S., Warren, K., **Paul, S.** (2022). Identifying Peer Influence in Therapeutic Communities. ***Submitted***. **Preprint at arXiv: 2203.14223**

18. **Paul, S.**, Chen, Y. (2016). Orthogonal symmetric non-negative matrix factorization under the stochastic block model. ***Submitted. Preprint at arXiv:1605.05349***.

19. Wang S.S.*, **Paul, S.**, (2022). Modeling network and item responses with correlated latent variables. ***Submitted.***

20. Zhao, L.*, Soliman, H.*, Xu, K. S., **Paul, S.,** (2023). Spectral clustering with dependent excitations for temporal networks. ***Submitted.***

Grants

DMS-1830547	NSF DMS-NGIA grant under the program "Algorithms for Threat Detection" for the project on "Spatio-Temporal Data Analysis with Dynamic Network Models". **Principal Investigator**. Total award amount in collaborative grant $200,000. Years active 08/01/2018-07/31/2021.

Awards and Honors

OSU 2018	The Ohio State University Institute for Teaching and Learning (UITL) Endorsement: Foundation, Impact, Transformation (FIT).
JSM 2017	Runner-up award winner of Student Paper Competition for Joint Statistical Meetings 2017 by American Statistical Association's Imaging Section.

Norton 2016	Recipient of Norton Prize for Outstanding Doctoral Dissertation, Department of Statistics, University of Illinois at Urbana-Champaign.
JSM 2015	Winner of Student Paper Competition for Joint Statistical Meetings 2015 by American Statistical Association's section on Statistical Learning and Data Mining.
IISA 2013	Best Student Paper in Theory and Methods Award at the International Indian Statistical Association Conference 2013.
IISA 2015	Student Paper Competition finalist in Theory and Methods at the International Indian Statistical Association Conference 2015.
2009-2012	Scholarship for Higher Education (INSPIRE) by Department of Science and Technology, Government of India.
2007-2008	Jagadish Bose National Science Talent Search (JBNSTS) Fellowship Award.

Research Interests

Statistical inference in networks, Multi-layer and dynamic networks, Matrix factorization, Spatiotemporal data, Neuroimaging data analysis, Statistical machine learning, Data science,

Teaching Experience

Endorsement	**University Institute for Teaching and Learning (UITL) Endorsement: Foundation, Impact, Transformation (FIT)**, *OSU.*
	Special credential awarded to individuals across Ohio State to acknowledge their dedicated and substantial effort in continued professional learning in instructional development. This endorsement represents in-depth, sustained, and recognized approaches to pedagogical improvement and excellence.
AU 21, AU 20	**Advanced Statistical Theory I (STAT 7301)**, *Faculty Instructor, OSU.*
	Graduate course offered to Statistics and Biostatistics PhD students as a required course in their curriculum. Topics in the course include estimation methods and asymptotic theory.
SP 18, SP 19, AU 19, SP 20, AU 20, SP 21, SP 22, SP 23	**Applied Regression Analysis (STAT 6450)**, *Faculty Instructor, OSU.* An application focused graduate course offered to Statistics MAS students as well graduate students from other departments. It is a required course in multiple data science programs.
AU 17, AU 18, SP 22, SP23, AU 23	**Introduction to Probability for Data Analytics (STAT 3201)**, *Faculty Instructor OSU.* Undergraduate course offered to students pursuing majors in Statistics and Data Analytics.
SP 20	**Advanced Graduate Topic Course on Statistcal Inference in Networks Data (STAT 8810)**, *Faculty Instructor, OSU.*
	Graduate course offered to Statistics PhD students as well PhD students from diverse departments.
AU 22, AU 23	**Data Analytics Foundation I (GRADTDA 5401)**, *Faculty Instructor, OSU.*
	A course in the professional masters program in Data Science offered through TDAI.
Fall 2013	**Statistics (STAT 100)**, *Graduate Instructor*, UIUC.
	Featured in CITES teaching and learning with technology blog (Link).

Student Advising

○ **PhD students (completed):**

- Lingfei Zhao, PhD in Statistics, now Research Scientist at Meta.
- Prateek Sasan, PhD in Statistics (co-advised), now Data Scientist at JP Morgan Chase. Prateek received the Whitney award for research from the Department of Statistics in 2022.
- Selena Shuo Wang, PhD in Psychology (co-advised) and MS in Statistics, now Postdoctoral Scholar in Biostatistics at Yale University.

○ **PhD students (ongoing):** Olivia Cleymaet, Kartik Lovekar

- **PhD committee member (ongoing and completed):** Amartya Ghosh, Xiaohan Fu, Matthew Wascher, Wenna Xi, Cory Shain.

Presentations

- Presented at the *INFORMS* conference, Phoenix, AZ, October 2023.
- *Invited talk* at the Brin Mathematical Research Center, College Park, MD, October 2023.
- *Invited talk at Econometrics and Statistics (EcoSta) Virtual conference*,Tokyo, Japan, June 2022.
- Topic-Contributed Session sponsored by Section on Statistics in Defense and National Security at the Joint Statistical Meetings, August 2021.
- *Invited talk at CMStatistics Virtual conference*, London, UK, December 2021.
- *University of Pittsburgh Department of Statistics Seminar*, Pittsburgh, PA, October 2021.
- *Invited talk at CMStatistics Virtual conference*, London, UK, December 2020.
- *NSF ATD virtual workshop*, Washignton DC, October 2020.
- *Invited talk at International Indian Statistical Association Conference (IISA-2019)*, Mumbai, India, December 2019.
- *NSF ATD + AMPS workshop*, Washignton DC, October 2019.
- *Invited talk at Annual Conference of the Animal Behavior Society (ABS 2019)*, Chicago, IL, July 2019.
- *Session organizer and invited speaker at IEEE DSW 2019–Data Science Workshop*, Minneapolis, MN, June 2019.
- *Invited talk at CMStatistics conference*, Pisa, Italy, December 2018.
- *MBI Workshop on modeling and analysis of dynamic networks*, Columbus, Ohio, November 2018
- *Invited talk at AMS Spring Southeastern Sectional Meeting*, Nashville, TN, April, 2018
- *Invited talk at Workshop on Network and Graphical Statistics, ISI*, Kolkata, India, January 2018.
- *Invited talk at International Indian Statistical Association Conference (IISA 2017)*, Hyderabad, India, December 2017.
- *Invited talk at CMStatistics 2017*, London, UK, December 2017.
- *Invited seminar talk at University of Toledo*, Toledo, OH, October 2017.
- *NetSci 2017, poster presentation*, Indianapolis, IN, June 2017.
- *Joint Statistical Meetings*, Chicago, IL, August 2017.
- *Norton Lecture at Bohrer Workshop*, Urbana-Champaign, IL, November 2016.
- *Joint Statistical Meetings*, Chicago, IL, August 2016.
- *International Indian Statistical Association Conference*, Pune, India, December 2015.
- *Joint Statistical Meetings*, Seattle, WA, August 2015.
- *Statistics for Complex System Conference (Poster)*, Madison, WI, June 2015.
- *International Indian Statistical Association Conference*, Chennai, India, January 2013.

Referees for Journals

- The Annals of Statistics (4)
- Journal of the American Statistical Association (3)
- Journal of Royal Statistical Society - Series B (1)
- Biometrika (2)
- Bernoulli (1)
- Journal of Machine Learning Research (1)

- Electronic Journal of Statistics (2)
- Technometrics (3)
- Statistica Sinica (1)
- Journal of Computational and Graphical Statistics (1)
- Annals of Applied Statistics (3)
- Bayesian Analysis (1)
- Computational Statistics and Data Analysis (2)
- Biometrics (1)
- Statistics and Computing (1)
- Journal of Business and Economic Statistics (1)
- Psychometrika (1)
- Network Science (1)
- Sankhya (2)
- Multivariate Behavioral Research (1)
- Statistical Modelling (1)
- Metrika (1)
- Psychiatry Research: Neuroimaging (1)
- Computational Brain and Behavior (1)
- Journal of Selected Topics in Signal Processing (1)

Service and Activities

- Department service – **Member of Graduate admissions committee (2017, 2018, 2019, 2020, 2021, 2022)**, **Member of Faculty Search Committee (2021, 2023)**, **Chair of Ph.D. qualifying exam Level II committee, 2023** and member (2018, 2021), MAS final exam committee member (2017, 2019, 2020).
- TDAI service - **Co-director of TDAI Community of practice on Foundations of Data Science and AI (2022, 2023)**, Organizing committee member for TDAI speaker series, 2020-2021, and Judge for TDAI fall forum poster session in 2021-2022.
- Judge for ASA Datafest event hosted by Data Analytics program at OSU in 2018 and 2019.
- **Invited Session Organizer** at CMStatistics 2020 virtual conference, IEEE Data Science workshop 2019, and IISA 2017 Conference.
- Chair of the Graduate Student Invited Seminar committee at the Department of Statistics, UIUC, 2016-2017.
- Former member of Statistics for Community (Statcom), a pro bono statistical consulting group by graduate students at UIUC.
- "Freedom of the hall" trophy for extraordinary leadership and (non-academic) achievement by an outgoing student, LLR hall, IIT Kharagpur, 2012.