Srijan Sengupta

CONTACT INFORMATION

Department of Statistics, NC State University
5144 SAS Hall
2311 Stinson Drive — Email: ssengup2@ncsu.edu
Raleigh, NC 27695 — https://statistics.sciences.ncsu.edu/people/ssengup2

EXPERIENCE

North Carolina State University, Raleigh, NC

Assistant Professor of Statistics (tenure-track) — Aug 2020 – present

Virginia Tech, Blacksburg, VA

Assistant Professor of Statistics (tenure-track) — Aug 2016 – Aug 2020

Max New York Life, Gurgaon, India

Product Pricing & Risk Management Actuary — Aug 2010 – Jul 2011

ICICI Prudential, Mumbai, India

Risk Management Actuary — Jun 2009 – Jul 2010

EDUCATION

University of Illinois at Urbana-Champaign, IL
Ph.D. in Statistics — Aug 2011 - Jul 2016
Norton prize for outstanding Ph.D. Thesis
Advisors: Prof. Yuguo Chen and Prof. Xiaofeng Shao

Indian Statistical Institute, Kolkata, India
M.Stat (1^{st} *Division with Distinction*) — Jul 2007 - May 2009
Specialization: Mathematical Statistics and Probability

Indian Statistical Institute, Kolkata, India
B.Stat (1^{st} *Division with Distinction*) — Jul 2004 - May 2007

RESEARCH AREAS

Methodological interests: Statistical inference in networks, Anomaly detection and network surveillance, Bootstrap and related resampling methods, Scalable inference for massive data.
Application areas/collaborative interests: Social determinants of health, Healthcare analytics, Space Physics, Epidemiology, Cybersecurity.

RESEARCH GRANTS AWARDED

1. **NIH R01 grant:** Statistical algorithms for anomaly detection and pattern recognition in patient safety event reports — 08/19–07/22
   Role: Principal Investigator — Amount: $890,055
   Funding agency: National Institutes of Health
   Funding program: Joint DMS/NLM Initiative on Generalizable Data Science Methods for Biomedical Research (NSF-NIH joint program)

2. Social determinants of health (Phase I and II) — 05/17–12/18
   Role: Principal Investigator — Amount: $141,389
   Funding agency: Socially Determined Inc.

3. Luther and Alice Hamlett Undergraduate Research Support — 08/17–12/20
   Role: Principal Investigator — Amount: $18,000
   Funding agency: Virginia Tech Foundation

4. Scalable Statistical Inference and Anomaly Detection for Large, Sparse Networks (Dean's Discovery Fund) — 08/17–05/18
   Role: Principal Investigator — Amount: $10,000
   Funding agency: Virginia Tech Foundation

5. Early Career Faculty Grant — 2017–18
   Role: Principal Investigator — Amount: $1,500
   Funding agency: Virginia Tech Foundation

Awards & Honors

1. IMS Travel Award from Institute of Mathematical Statistics 2016
2. Norton Prize for Outstanding PhD Thesis, University of Illinois 2015
3. Birla Sun Life Excellence award, Institute of Actuaries of India 2009
4. Dean's List for exceptional performance, Indian Statistical Institute 2004

Publications

1. Guo, Z., Cho, J. H., Chen, I. R., **Sengupta, S.**, Hong, M., & Mitra, T. (2021). Online Social Deception and Its Countermeasures: A Survey.
IEEE Access, **vol. 9**, pp. 1770-1806, 2021, doi: 10.1109/ACCESS.2020.3047337.

2. Kodali, L., **Sengupta, S.**, House, L., Woodall, W.H. (2020). The Value of Summary Statistics for Anomaly Detection in Temporally-Evolving Networks: A Performance Evaluation Study.
Applied Stochastic Models in Business and Industry, **2020**, 1–34.
arXiv preprint: https://arxiv.org/abs/1910.06497

3. Leitch, J., Alexander, K. A., and **Sengupta, S.** (2019). Toward epidemic thresholds on temporal networks: a review and open questions.
Applied Network Science, **4**, 105 (2019) doi:10.1007/s41109-019-0230-4
arXiv preprint: https://arxiv.org/abs/1910.11474

4. Komolafe, T., Quevedo, A., **Sengupta, S.,** and Woodall, W. H. (2019) . Statistical Evaluation of Spectral Methods for Anomaly Detection in Networks.
Network Science, **7(3)**, 319–352.
arXiv preprint: https://arxiv.org/abs/1711.01378

5. Debchoudhury, S., **Sengupta, S.**, Earle, G., and Coley, W. (2019). A bootstrap based approach for improving measurements by retarding potential analyzers.
Journal of Geophysical Research, **124**, 4569–4584.

6. Li, M., **Sengupta, S.**, and Hanigan, M. (2019). Using Artificial Neural Networks to Predict pH, Ammonia, and Volatile Fatty Acid Concentrations in the Rumen.
Journal of Dairy Science, **102(10)**, 8850–8861.

7. **Sengupta, S.** and Chen, Y. (2018). A blockmodel for node popularity in networks with community structure.
Journal of the Royal Statistical Society: Series B, **80(2),** 365–386.

8. Zhao, M., Driscoll, A., **Sengupta, S.,** Stevens, N.T., Fricker, R., and Woodall, W. H. (2018). The effect of temporal aggregation level in social network monitoring.
PLoS ONE, **13(12)**: e0209075.

9. Zhao, M., Driscoll, A., **Sengupta, S.,** Fricker, R., Spitzner, D., and Woodall, W. H. (2018). Performance Evaluation of Social Network Anomaly Detection Using a Moving Window Based Scan Method.
Quality and Reliability Engineering International, **2018 (34)**, 1699 – 1716.

10. **Sengupta, S.**, Volgushev, S., and Shao, X. (2016). A subsampled double bootstrap for massive data.
Journal of the American Statistical Association (Theory and Methods), **111,** 1222-1232.
Finalist: ASA Nonparametric Statistics Student Paper Award, 2015.

11. **Sengupta, S.** and Chen, Y. (2015). Spectral clustering in heterogeneous networks.
Statistica Sinica, **25**, 1081-1106.

Student advisees are underlined

12. **Sengupta, S.**, Shao, X., and Wang, Y. (2015). The dependent random weighting. *Journal of Time Series Analysis,* **36**, 315-326.
Invited paper for the special issue on "Recent developments in bootstrap methods for dependent data".

13. **Sengupta, S.** and Woodall, W. H. (2018). Invited discussion of "Statistical methods for network surveillance".
Applied Stochastic Models in Business and Industry, **34,** 446-448.

14. **Sengupta, S.** (2010). Modeling the zero coupon yield curve: A regression based approach. In *Proceedings of 12th Global Conference of Actuaries.*

Papers under review or in revision

15. Boxley, C., Krevat, S., **Sengupta, S.**, Ratwani, R., and Fong, A. (2020+). Understanding Temporal Themes in COVID-19 Related Patient Safety Event Reports.

16. Dasgupta, A. and **Sengupta, S.** (2020+). Scalable estimation of epidemic thresholds via node sampling.
arXiv preprint: https://arxiv.org/abs/2007.14820

17. **Sengupta, S.**, Larsen, N., and Stallrich, J. (2020+). HODOR: Hold-Out Design for Online A/B testing with Lurking Variables.

18. Fong, A., Pruitt, Z., Boxley, C., Krevat, S., **Sengupta, S.** and Ratwani, R. (2020+). The Impact of COVID-19 on Medical Device Safety.

19. Bhadra, S., Chakraborty, K. **Sengupta, S.**, and Lahiri, S.N. (2020+). A Bootstrap-based Inference Framework for Testing Similarity of Paired Networks.
arXiv preprint: https://arxiv.org/abs/1911.06869

20. **Sengupta, S.**(2020+). Anomaly detection in static networks using egonets.
arXiv preprint: https://arxiv.org/abs/1807.08925

Invited Talks at Conferences

1. "A nonparametric test of co-spectrality in networks", at the *CMStatistics 2020 (ERCIM 2020)*, London, UK, Dec 2020. *(moved to virtual due to COVID-19)*

2. "Anomaly detection in static networks via egonets", at the *Biennial Conference of the International Society of Non-Parametric Statistics*, Paphos, Cyprus, Jun 2020. *(postponed due to COVID-19)*

3. "Statistical Inference of Unstructured Data for Patient Safety", at the *Special Workshop on AI topics for Healthcare*, Washington, DC, Nov 2019.

4. "Anomaly detection in static networks via egonets", at the *36th Annual Quality and Productivity Research Conference*, Washington, DC, Jun 2019.

5. "Anomaly detection in static networks via egonets", at the *2019 IMS/ASA Spring Research Conference*, Blacksburg, VA, May 2019.

6. "Anomaly detection in static networks via egonets", at *Statistics & Data Science Symposium*, University of California at San Diego, Jan 2019.

Student advisees are underlined

7. "Anomaly detection in static networks via egonets", at *International conference on Network Science in Economics and Finance*, Indian Institute of Management, Ahmedabad, India, Dec 2018.
8. "Anomaly detection in static networks via egonets", at *CMStatistics 2018*, Pisa, Italy, Dec 2018
9. "Anomaly detection in static networks via egonets", at *2018 International Symposium on Business and Industrial Statistics*, University of Piraeus, Greece, Jul 2018.
10. "Scalable bootstrap strategies for massive data", at *Biennial Conference of the International Society of Non-Parametric Statistics*, Salerno, Italy, Jun 2018
11. "Efficient community detection using network subsampling", at *Annual Conference of the International Indian Statistical Association*, Gainesville, Florida, May 2018
12. "Efficient community detection using network subsampling", at *Workshop on Networks and Graphs*, Kolkata, India, Jan 2018
13. "Modeling node popularity in networks", at *Annual Conference of the International Indian Statistical Association*, Hyderabad, India, Dec 2017
14. "Big data bootstrap", at *CMStatistics 2017*, London, UK, Dec 2017
15. "Big data bootstrap", at *Annual Conference of the International Chinese Statistical Association*, Vancouver, Canada, Aug 2017
16. "Modeling node popularity in networks", at *Mini Conference on Networks and Games, Indian Statistical Institute, Kolkata*, India, Jul 2017
17. "Modeling node popularity in networks", *Norton Lecture* at *Bohrer Workshop*, University of Illinois at Urbana-Champaign, Nov 2015
18. "Modeling the zero coupon yield curve: A regression based approach", at the *12th Global Conference of Actuaries*, Mumbai, India, Feb 2010

INVITED COLLOQUIUM TALKS/ ACADEMIC VISITS

19. *North Carolina State University*, Jan 2021
20. *North Carolina State University*, Jan 2020
21. *Indian Institute of Science, Bangalore*, Jan 2020
22. *Indian Institute of Technology, Gandhinagar*, Jan 2020
23. *Virginia Tech (Department of Psychology)*, Mar 2019
24. *University of Virginia*, Nov 2018
25. *Duke University*, Mar 2018
26. *Indian Statistical Institute, Kolkata*, India, Jan 2018
27. *University of Michigan at Ann Arbor*, Oct 2017
28. *Indian Statistical Institute, Kolkata*, India, Jul 2017
29. *University of Florida*, Jan 2016
30. *The Ohio State University*, Jan 2016
31. *Virginia Tech*, Dec 2015

EDITORIAL AND PEER REVIEW SERVICE

- Associate Editor of Sankhya, Series B — 2021— Present
- NSF merit review panelist — 2019 — 2020
- Peer Review for journals: Annals of Statistics, Journal of the Royal Statistical Society (Series B), Journal of the American Statistical Association, Journal of Business & Economic Statistics, Network Science, Electronic Journal of Statistics, Bayesian Analysis, Technometrics, Annals of Applied Statistics, Journal of Computational and Graphical Statistics, Computational Statistics & Data Analysis, Sankhya, Journal of Time Series Analysis, Social Network Analysis and Mining, Chapman & Hall/CRC Texts in Statistical Science.

Teaching Experience

1. **Faculty instructor At NC State (2020–Now)**

   STAT 758 Computation for Statistics Research (Ph.D. level course)
   STAT 372 Introduction to Statistical Inference and Regression

2. **Faculty instructor At Virginia Tech (2016–2020)**

   STAT 6984 Statistical Analysis of Networks (Ph.D. topics course)
   STAT 5504 Multivariate Analysis (Ph.D. level)
   CMDA 3654 Introduction to Data Analytics & Visualization
   CMDA 4984 Statistical Analysis of Networks

3. **Graduate Student Instructor At UIUC (2011–2015)**

   STAT 200 Statistical Analysis
   STAT 400 Stat and Prob I

Ph.D. Advising (NCSU)

1. Subhankar Bhadra (NCSU) — current student
2. Nicholas Larsen (NCSU, joint with Jon Stallrich) — current student

Dissertation Committee member (NCSU)

1. Ethan Davis (Ph.D., Statistics) — current student

Ph.D. Advising (VT)

1. Lata Kodali (VT) — Graduated Summer 2020

Dissertation Committee member (VT)

1. Jack Leitch (Ph.D., Ecology) — current student
2. Shuchismita Biswas (Ph.D., Power Systems) — current student
3. Bipasha Banerjee (Ph.D., Computer Science) — current student
4. Yanliang Yang (Ph.D., ECAG) — Graduated Spring 2019
5. Shantanab Debchoudhury (Ph.D., EE) — Graduated Spring 2019
6. Tomilayo Komolafe (Ph.D., ISE) — Graduated Fall 2018
7. Pavan Bellam (M.S., Computer Engineering) — Graduated Fall 2017
8. Meng John Zhao (Ph.D., Statistics) — Graduated Summer 2017

Undergraduate research advising (VT)

1. Shivani Garg (power grid networks) — Spring 2019 - Fall 2019
2. Raghav Sawhney (Public Health analytics) — Fall 2019
3. Cameron Bissell (Public Health analytics) — Fall 2019
4. Romcholo Macatula (social determinants of health) — Summer 2017
5. Rachel Szabo (power grid networks) — Fall 2017 - Fall 2018
6. Kevin Ryan (power grid networks) — Spring 2018
7. Mike Liao (fake news detection) — Fall 2017 - Spring 2018
8. Andrew Bowers (fake news detection) — Fall 2017

9. Tara Amruthur (fake news detection) — Spring 2018
10. Hani Slamani (fake news detection) — Spring 2018
11. Pim Silpacharn (text analytics in public health) — Spring 2018
12. Malvika Marathe (text analytics in public health) — Spring 2018
13. Sean Pili (core-periphery inference in networks) — Fall 2017

University Service

- College of Science, Virginia Tech — Jan 2019 — May 2019
- Member of CMDA faculty hiring committee
  College of Science, Virginia Tech — Jan 2019 — Present
- Member of CMDA Curriculum committee
  College of Science, Virginia Tech — Aug 2018 — May 2019
- Chair of Colloquium committee
  Department of Statistics, Virginia Tech — Aug 2018 — May 2019
- Member of Computing/Web committee
  Department of Statistics, Virginia Tech — Aug 2016 — Now
- Member of faculty hiring committee
  Department of Statistics, Virginia Tech — Aug 2017 — May 2018
- Member of Colloquium committee
  Department of Statistics, Virginia Tech — Aug 2017 — May 2018
- Member of Student Appeals Committee
  Department of Statistics, UIUC — Aug 2014 — Jul 2016

Actuarial qualification

- Actuarial qualification: passed 12 exams from Institute and Faculty of Actuaries (UK)/ Institute of Actuaries of India.
  - Specialist technical subjects ST6 (Finance & Investment B) and ST9 (Enterprise risk management).
  - Core application subject CA3 (*ranked* 1^{st} *in India*)
  - Core technical subjects CT1 – CT9 (complete CT series)
- Worked for two years as risk management and product pricing actuary, specializing in asset-liability matching, pricing the cost of embedded financial guarantees, value-at-risk, and economic capital