

SHIRSHENDU CHATTERJEE

◆ CONTACT INFORMATION

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◆ APPOINTMENTS

- ▶ *City University of New York*, New York, NY, USA
 - ★ **Associate Professor** (2021 - present) at the Department of Mathematics at the *City College*.
 - ★ **Doctoral Faculty member** (2017 - present) at the Department of Mathematics at the *Graduate Center*.
 - ★ **Assistant Professor** (2014 - 2021) at the Department of Mathematics at the *City College*.
- ▶ *Oregon State University*, Corvallis, OR, USA
 - ★ **Courtesy Faculty member** (2021 - present) at the Department of Statistics.
- ▶ *Courant Institute of Mathematical Sciences*, New York University, New York, NY, USA
 - ★ **Courant Instructor/Non-tenure track Assistant Professor** (2011 - 2014).

◆ ACADEMIC DETAILS

- ▶ *Cornell University*, Ithaca, NY USA
 - ★ **Ph.D.** in *Operations Research & Information Engineering*, August 2011.
 - ✦ Concentration: *Probability and Statistics*; Minor: *Optimization, Mathematics*
 - ✦ Thesis title: “*Analysis of Four Particle Systems*”
 - ✦ Thesis Advisor: Prof. Rick Durrett
 - ★ **M.S.** in *Operations Research & Information Engineering*, May 2009.
- ▶ *Indian Statistical Institute*, Kolkata, WB, India
 - ★ **M.Stat (Master of Statistics)**, *Honors with Distinction*, May 2006.
 - ✦ Specialization: *Mathematical Statistics and Probability*.
 - ✦ Master’s Thesis: “*Statistical Learning Based on High Dimensional Data: Some Issues and Remedies for High Dimensionality in Clustering and Classification.*” Available at www.cims.nyu.edu/~chatterj/Research
 - ✦ Thesis Advisors: Dr. Debasis Sengupta and Dr. Probal Chaudhuri
 - ★ **B.Stat (Bachelor of Statistics)**, *Honors with Distinction*, May 2004.

- ◆ **RESEARCH INTEREST:** Mathematical and statistical modeling of different biological, social, and physical phenomena and complex structures; theoretical analysis of such models; developing statistical frameworks, machine learning algorithms, and data-driven inference procedures to address inferential questions arising in biosciences, social sciences, computer science, and physical sciences; empirical analysis of experimental and observational data.

◆ PUBLICATIONS AND PREPRINTS : (In reverse Chronological order)

31. *Phase Transitions in The Distributional Convergence for One-dimensional Long Range First-passage Time*. S. Chatterjee and P. Dey. Near Completion.

30. *Bayesian Change Point Detection: An Application to Detect Trend Changes in COVID-19*. R. Sidani, S. Chatterjee, and C. Fuentes. Near completion.
29. *Local change point detection methods intransitive inhomogeneous random graphs*. S. Bhattacharyya, S. Chatterjee, S. K. De, and S. S. Mukherjee. Near Completion. Abstract is available on my website.
28. *Concentration of Mean Adjacency and Laplacian Matrices for Lazy Network Processes with Applications*. S. Chatterjee, A. Nath, S. S. Mukherjee, S. Bhattacharyya, and S. Chatterjee. Near Completion. Abstract is available on my website.
27. *Comparing fatality of patients with COVID-19 and the flu using machine learning methods*. J. Pedro, Y. Huang, J. A. C. Broek, S. Chatterjee, and B. Mishra. Near Completion. Abstract is available on my website.
26. *Detection of Temporal Shifts in Semantics of “China virus” Using Local Graph Clustering*. N. Hwang, S. Chatterjee, Y. Di, and S. Bhattacharyya. Submitted, 2022. Abstract is available on my website.
25. *On the association between estimated Covid-19 case fatality rates and the socioeconomic and health factors in the US States of Florida and New York*. M. Joshi, Y. Di, S. Bhattacharyya, and S. Chatterjee. Submitted, 2021. Abstract is available on my website.
24. *Mathematics of YACHT (Yet Another Covid Health Testing) Protocol for Epidemic Management*. I. Enaganti, S. Chatterjee, and B. Misgra. Submitted, 2021. Abstract is available on my website.
23. *Subcritical Connectivity and Some Exact Tail Exponents in High Dimensional Percolation*. S. Chatterjee, J. Hanson, and P. Sosoe. Submitted, 2021. Preprint is available at the arXiv 2107.14347.
22. *Towards Optimal Tracing Strategy in Pandemics with applications to Covid-19*. I. Enaganti, S. Chatterjee, K. Meel, B. Mishra. Submitted, 2021. Abstract is available on my website.
21. *On the estimation of the number of communities for sparse networks*. N. Hwang, J. Xu, S. Chatterjee, and S. Bhattacharyya. Submitted, 2021. Abstract is available on my website.
20. *Consistent detection and optimal localization of all detectable change-points in piecewise stationary arbitrarily sparse network-sequences*. S. Bhattacharyya, S. Chatterjee, and S. S. Mukherjee. Submitted, 2021. Preprint is available at the arXiv.
19. *The effect of avoiding known infected neighbors on the persistence of a recurring infection process*. S. Chatterjee, D. Sivakoff, and M. Wascher. Submitted, 2020. Preprint is available at the arXiv.
18. *General Community Detection with Optimal Recovery Conditions for Multi-relational Sparse Networks with Dependent Layers*. S. Bhattacharyya and S. Chatterjee. Submitted, 2020. Available at the arXiv.
17. *Observational Study of the Effect of the Juvenile Stay-At-Home Order on SARS-CoV-2 Infection Spread in Saline County, Arkansas*. N. Hwang, S. Chatterjee, Y. Di, and S. Bhattacharyya. To appear in ***Statistics and Public Policy***. Preprint is available at the the arXiv.
16. *A general framework for spatio-temporal modeling of epidemics with multiple epicenters with an application to aeriually dispersed plant disease*. A. M. E. Ojwang, T. Ruiz, S. Bhattacharyya, S. Chatterjee, P. S. Ojiambo, and D. Gent. ***Frontiers in Applied Mathematics and Statistics, section Dynamical Systems***. DOI: 10.3389/fams.2021.721352. Selected for “Outstanding Article award” for the journal ***Frontiers in Applied Mathematics and Statistics***. Featured in the dedicated collection “2021 Editor’s Pick: Applied Mathematics and Statistics”.
15. *The Bethe Hessian and Information Theoretic Approaches for Online Change-Point Detection in Network Data*. N. Hwang, J. Xu, S. Chatterjee, and S. Bhattacharyya. To appear in ***Sankhya A***. DOI: 10.1007/s13171-021-00248-1. Available on my website.
14. *Bacterial Swarmers Enriched during Intestinal Stress Ameliorate Damage*. W. Chen, A. De, H. Li, D. J. Lukin, W. Szymczak, K. Sun, L. Kelly, J. R. Wright, R. Lamendella, S. Ghosh, D. B. Kearns, Z. He, C. Jobin, X. Luo, A. Byju, S. Chatterjee, B. San Yeoh, M. Vijay-Kumar, J. X. Tang, S. Mani. ***Gastroenterology* 161 (2021)**, issue 1, pages 211-224.

13. *Using Attendance Data for Social Network Analysis of a Community-Engaged Research Partnership.* K. S. Vasquez, S. Chatterjee, C. Khalida, D. Moftah, B. DÓrazio, A. Leinberger-Jabari, J. N. Tobin, and R. G. Kost. ***Journal of Clinical and Translational Sciences* 5 (2021)**, issue 1, E75. DOI:10.1017/cts.2020.571.
12. *Restricted percolation critical exponents in high dimensions.* S. Chatterjee and J. Hanson. ***Communications on Pure and Applied Mathematics* 73 (2020)**, issue 11, pages 2370-2429. DOI: 10.1002/cpa.21938.
11. *Targeting the Pregnane X Receptor Using Microbial Metabolite Mimicry* Z. Dvořák, F. Kopp, C. M. Costello, J. S. Kemp, H. Li, A. Vrzalová, M. Štěpánková, I. Bartoňková, E. Jiskrová, K. Poulková, B. Vyhldalová, L. U. Nordstroem, C. V. Karunaratne, H. S. Ranhotra, K. S. Mun, A. P. Naren, I. A. Murray, G. H. Perdew, J. Brtko, L. Toporova, A. Schn, W. G. Wallace, W. G. Walton, M. R. Redinbo, K. Sun, A. Beck, S. Kortagere, M.C. Neary, A. Chandran, S. Vishveshwara, M. M. Cavalluzzi, G. Lentini, J. Y. Cui, H. Gu, J. C. March, S. Chatterjee, A. Matson, D. Wright, K. L. Flannigan, S. A. Hirota, R. B. Sartor, S. Mani. ***EMBO Molecular Medicine (Cover page)* 12 (2020)**, issue 4, pages e11621. DOI: 10.15252/emmm.201911621.
10. *Consistent Recovery of Communities from Sparse Multi-relational Networks: A Scalable Algorithm with Optimal Recovery Conditions* S. Bhattacharyya and S. Chatterjee. ***Complex Networks XI, (2020)***, Proceedings of the 11th Conference on Complex Networks CompleNet 2020, pages 92–103.
9. *Optimal change point estimator for network data.* S. Bhattacharya, S. Chatterjee, and S. S. Mukherjee. Book of Abstract of Complex Networks 2019, the 8th International Conference on Complex Networks and their Applications (2019), pages 375 - 377.
8. *Thresholds for Detecting an Anomalous Path From Noisy Environments.* S. Chatterjee and Ofer Zeitouni. ***The Annals of Applied Probability* 28 (2018)**, no. 5, pages 2635-2663.
7. *Phase transition for the threshold contact process, an approximation of heterogeneous random Boolean networks.* S. Chatterjee. ***Probability Theory and Related Fields* 165 (2016)**, no. 3, pages 985-1023.
6. *Multiple phase transitions for long-range first-passage percolation on square lattices.* S. Chatterjee and P. S. Dey. ***Communications on Pure and Applied Mathematics* 69 (2016)**, no. 2, pages 203 - 256.
5. *Jigsaw percolation: What social networks can collaboratively solve a puzzle?.* C. D. Brummitt, P. S. Dey, S. Chatterjee, and D. Sivakoff. ***The Annals of Applied Probability* 25 (2015)**, no. 4, pages 2013 - 2038.
4. *A first order phase transition in the threshold $\theta \geq 2$ contact process on random r -regular graphs and r -trees.* S. Chatterjee and R. Durrett. ***Stochastic Processes and Their Applications* 123 (2013)**, no. 2, pages 561-578.
3. *Asymptotic Behavior of Aldous' Gossip Process.* S. Chatterjee and R. Durrett. ***The Annals of Applied Probability* 21 (2011)**, no. 6, pages 2447-2482.
2. *Persistence of Activity in Threshold Contact Processes, an "Annealed Approximation" of Random Boolean Networks.* S. Chatterjee and R. Durrett. ***Random Structures and Algorithms* 39 (2011)**, issue 2, pages 228 - 246.
1. *Contact process on random graphs with power law degree distribution has critical value 0.* S. Chatterjee and R. Durrett. ***The Annals of Probability* 37 (2009)**, no. 6, pages 2322-2356.

♦ **RESEARCH GRANT:**

- ▶ Recipient (PI) of Cycle 52 **PSC-CUNY Enhanced** Research Award (2021-2022). Award # 64673-00 52. Project title: *Analysis of change-point detection algorithms for dynamic random graph models.*

- ▶ Recipient (CoPI) of Syracuse University’s Intelligence Community Center for Academic Excellence (SU ICCAE) Research Grant (summer 2020).
- ▶ Recipient (PI) of Cycle 50 **PSC-CUNY Enhanced** Research Award (2019-2021).
Award # 62781-00 50. Project title: *Analysis of community detection algorithms for dynamic random graph models*.
- ▶ Recipient (PI) of **NSF Grant** from the probability program (2018-2022).
Award # DMS-18-12148. Project title: *Mathematical models for understanding the effect of long-range interactions and intervention measures*.
- ▶ Recipient (PI) of **Simons Foundation Grant** “Mathematics and Physical Sciences-Collaboration Grants for Mathematicians” (2016-2022).
Award # 430073. Project title: *Collaborative Research on Stochastic Modeling and Analysis of Dynamics on/of Networks*.
- ▶ Recipient (PI) of Cycle 47 **PSC-CUNY Enhanced** Research Award (2016-2017).
Award # 69842-00 47. Project title: *Dynamics on Random Graphs*.
- ▶ Recipient (PI) of Cycle 46 **PSC-CUNY Trad-B** Research Award (2015-2016).
Award # 68828-00 46. Project title: *Stochastic growth models*.
- ▶ Supported by Cohen Fund for Science, CUNY Division of Science Research Grants.

◆ **MENTORING AND ADVISING ACTIVITIES:**

- ▶ **ACADEMIC ADVISING:** (Fall 2017 - present) Provided academic advising to **fifty two** advisees.
- ▶ **STUDENT MENTORING:** (Spring 2015 - present) Mentored **26** students for various research and learning projects.
 - ★ Supervised **18 masters students** at City College, CUNY.
 - ✦ (Spring 2022) Sharmin Begum and Hong Zhuang for their Independent Study in “Topics of Statistical Machine Learning”.
 - ✦ (Summer 2021) Raghu Siddani for his Rich Internship project on “Bayesian change-point detection methods for networks”.
 - ✦ (Summer 2021) Jared Gallegos for his Rich Internship project “Change-point detection based on network sampling”.
 - ✦ (Spring 2021) Jared Gallegos for his Independent Study in “Topics of statistical Analysis of Network Data”.
 - ✦ (Spring 2021) Raghu Siddani and Christopher Hayduk for their Independent Study in “Topics of Statistical Machine Learning”.
 - ✦ (Fall 2020) Yuxuan Huang for his Independent Study in “Statistical Machine Learning Algorithms Relevant for COVID-19 Data Analysis”.
 - ✦ (Summer 2020) Neil Hwang for his Rich Internship project on “The Bethe Hessian Spectral Method for Estimating Community Size in Generalized Networks”.
 - ✦ (Summer 2020) Joshua Pedro for his Rich Internship project “A Predictive Model for Mortality of Covid-19 Patients Using Machine Learning”.
 - ✦ (Summer 2020) Yuxuan Huang for his summer research project on “Machine Learning Algorithms for Identifying Predictive Biomarkers with Applications to Covid-19 Data”.
 - ✦ (Summer 2020) Raghu Siddani for his summer research project on “Bayesian Methods for Change-Point Detection with Applications to Covid-19 Data”.
 - ✦ (Fall 2019) Haoxu Li for his Independent Study in “Introduction to Network Science”.
 - ✦ (Summer 2019) Neil Hwang for his Rich Internship project “Change-Point Detection and Vertex-Clustering in Dynamic Network Models”.

- ✦ (Spring 2019) Arad Namin, Elena Redman, and Leonid Fishler for their Independent Study in “Deep Learning Procedures and Their Implementations”.
- ✦ (Summer 2018) Brisilda Ndreka for her Rich Internship project “Community Detection in Dynamic Mixed Stochastic Block Model”.
- ✦ (Summer 2018) Joshua Pedro for his Rich Internship project “An Econometric Model of Network Formation and Its Implementation”.
- ✦ (Fall 2017) Pavlos Sakoglou and David Bennett for their Independent Study in “Modern Supervised Learning Methods”.
- ✦ (Fall 2016) Cong Jiang and Shree R Saha for their Independent Study in “Regularized and Robust Regression Techniques”.
- ✦ (Summer 2016) Sergio Palomo for his Rich Internship project “Disease Outbreak Simulations”.
- ✦ (Summer 2016) Shree R Saha for his Rich Internship project “Simulation Study of Certain Long-Range First-Passage Times”.
- ✦ Supervised **eight undergraduate students** at City College, CUNY.
 - ✦ (Spring 2019) Yuxuan Huang for his Independent Study in “Deep Learning procedures and their implementations”.
 - ✦ (Spring 2019) Xiaolin Zhong for her Independent Study in “Mathematical Statistics”.
 - ✦ (Spring 2018) Justin Nunez for his Independent Study in “Introductory Topics in Statistical Machine Learning”.
 - ✦ (Fall 2017) Justin Nunez and Arnold King for their Independent Study in “Implementations of Linear Statistical Models using R”.
 - ✦ (Summer 2017) Jean-Pierre Kassegne for his Rich Internship project “Spectral Clustering Algorithms for Community Detection”.
 - ✦ (Fall 2015) Chun Biao Wang for his CUNY Graduate Center Pipeline Fellowship research project “Topics of Applied Mathematics in The Context of Econometric Data Analysis”.
 - ✦ (Spring 2015) Yash Bhardwaj and Anita Khair for their Independent Study in “Advanced Topics of Algorithms in Applied Linear Algebra”.
- ▶ **STUDENT DEVELOPMENT ACTIVITIES:** Organized several one-on-one career counseling sessions for **eight** masters students at City College, CUNY.
 - ✦ (Fall 2020) Negar Akbarzadeh, Maruf Amin, Jorge Monzon Diaz, Neil Hwang, Yuxuan Huang;
 - ✦ (Fall 2018) Brisilda Ndreka, Aydin Saribudak;
 - ✦ (Fall 2017) David Bennett, Pavlos Sakoglou;
 - ✦ (Fall 2017) Minwoo Bae, Cong Jiang;
 - ✦ (Fall 2015) Jonathan Inbal;
 - ✦ (Spring 2015) Emmanuel Ekwedike.

◆ **PROFESSIONAL ACTIVITIES:**

▶ **CONFERENCE AND SEMINAR ORGANIZATION**

- ✦ (August 2021) **Organizer** of an *IMS invited session* “Recent Developments in Network Inference Methods”, which has been selected for the (competitive) *invited program* of the virtual *Joint Statistical Meeting, 2021*.
- ✦ (May 2021) **Organizer** of an *invited session* “Advances in Network Data Analysis” at the (virtual) *IISA 2021 Conference*, which is organized by the *International Indian Statistical Association*.
- ✦ (Fall 2020 - present) **Organizer** of the Mathematics Colloquium at the *City College, City University of New York, New York, NY, USA*.
- ✦ (Fall 2020 - present, Spring 2017) **Organizer/co-organizer** of the *CUNY Probability Seminar* at the *Graduate Center, City University of New York, New York, NY, USA*.

- ★ (October 2019) **Co-organizer** of a special session “Percolation, Random Graphs, and Random Geometry”, which was selected for the *AMS Eastern Sectional Meeting at Binghamton University, Binghamton, NY, USA*.
- ★ (Spring 2017) **Organizer** of the *Data Science Seminar* at the *City College, City University of New York, New York, NY, USA*.
- ★ (2012 - 2014) **Organizer** of the *Probability and Mathematical Physics Seminar* at the *Courant Institute of Mathematical Sciences, New York University, New York, NY, USA*.
- ▶ **CONFERENCE/WORKSHOP PANELIST:** Invited panelist for **two** events.
 - ★ (2015) The conference “Research Experience and Mentoring”, organized by the National Science Foundation at the City College, City University of New York, New York, NY, USA.
 - ★ (2009) The panel discussion on “Experience of Higher Education as a Student with Disability” in the workshop “Introduction to Disability Studies”, organized by Cornell University at Cornell University, Ithaca, NY, USA.
- ▶ **REVIEW PANELIST:** Invited review panelist for **four** federal and non-federal funding agencies:
 - ✦ (2021, 2020) National Science Foundation, ✦ (2014) National Security Agency,
 - ✦ (2018) Simons Foundation, ✦ (2014) American Mathematical Society.
- ▶ **REVIEWER FOR JOURNALS:** Invited reviewer for **twenty** journals.

<ul style="list-style-type: none"> ✦ ALEA - Latin American Journal ✦ of Probability and Mathematical Statistics, ✦ Annales de l’Institut Henri Poincaré ✦ Annals of Applied Probability, ✦ Annals of Statistics, ✦ Applied Mathematics and Optimization, ✦ Applied Probability Trust, ✦ Electronic Communication in Probability, ✦ Electronic Journal of Combinatorics, ✦ Electronic Journal of Probability, ✦ Journal of American Statistical Association, 	<ul style="list-style-type: none"> ✦ Journal of Applied Probability, ✦ Journal of Statistical Physics, ✦ Journal of Statistical Planning and Inference, ✦ Neurocomputing, ✦ Probability in the Engineering and, Informational Sciences, ✦ Random Structures and Algorithms, ✦ Royal Society Open Science, ✦ Sankhya A, ✦ Stochastic Processes and their Applications, ✦ Transactions on Network Science and Engineering.
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- ▶ **EXTERNAL COMMITTEE SERVICES:**
 - ★ (Spring 2021) External member of the thesis committee of Jiarui Xu, Oregon State University.
 - ★ (Jan 2021) Invited member in the selection committee for recruiting in five positions at the Interdisciplinary Statistical Research Unit of Indian Statistical Institute, Kolkata, India.
- ▶ **CONSULTING EXPERIENCE:**
 - ★ (Fall 2019-present) Statistical consultant of Dr. Sridhar Mani for two projects on bacterial swarming and Pregnane X Receptor, which were funded by the Broad Medical Research Program at **CCFA** (Crohn’s & Colitis Foundation of America).
 - ★ (Fall 2018-Spring 2019) Provided consulting services to a community engagement clinical study, which was conducted by researchers of Rockefeller University Clinical and Translational Studies, and was funded by **PCORI** (Patient-Centered Outcomes Research Institute).
- ▶ **MEMBERSHIPS In PROFESSIONAL SOCIETIES:**
 - ✦ American Mathematical Society,
 - ✦ American Statistical Association,
 - ✦ Institute of Mathematical Statistics,
- ▶ **COMMUNITY SERVICE RELATED TO PROFESSION:** Mentor and Speaker at the “Career Support Group”, an US based nonprofit organization for advising graduate students in science for their academic and/or industrial career development.

◆ **INTERNAL COMMITTEE SERVICES:**

- ▶ **Serving** as the elected representative of the Math department to the College of Liberal Arts and Sciences (*CLAS*) council at *City College, CUNY* (Fall 2020 - present).
 - ▶ **Serving** for the *Calculus Committee* at *City College, CUNY* (Fall 2021 - present).
 - ▶ **Serving** for the *Scholarship Committee* at *City College, CUNY* (Spring 2020 - present).
 - ▶ **Serving** for the *Applied Math Committee* at *City College, CUNY* (Fall 2014 - present).
- ♦ **TEACHING EXPERIENCE:** Taught **thirteen** different courses at three universities.
- ▶ **Instructor** at the *Graduate Center, CUNY* for
 - ★ (Spring 2016) the doctoral level course *Topics in Probability Theory*, which covers
 - ✦ branching process and its properties;
 - ✦ the story of the Erdos-Renyi random graph and its properties (particularly phase transition resulting in a giant component, connectivity threshold, scaling limits of near-critical graphs);
 - ✦ other random graph models including configuration model, small world model, preferential attachment model etc. and their properties (particularly diameter and local neighborhoods);
 - ✦ introduction to dynamics taking place on random graphs such as epidemics, random walks, the voter model, first-passage percolation, competition models, etc.
 - ▶ **Instructor** at the *City College, CUNY* (Fall 2014 - present) for **ten** different courses:
 - for the graduate level courses
 - ★ (Math B7800) *Advanced Topics in Statistics* (during Spring of 2020, and 2018) covering
 - ✦ Multivariate linear regression models and associated statistical inference problems including the classical linear regression model, least square estimation, inference about the regression model, inference from the estimated regression function, model checking, variable selection, multivariate multiple regression, partial correlation, comparing regression models;
 - ✦ Introduction to nonlinear regression including simple and multiple logistic regression;
 - ✦ Principal component analysis including population principal components, large sample inference, use of principal components to summarize sample variation and quality control;
 - ✦ Discrimination and Classification including multiple multivariate normal population, evaluation of classification functions.
 - ★ (Math A7800/47800) *Advanced Mathematical Statistics* (during Fall of 2021, 2019, and 2017) covering
 - ✦ Multivariate random vectors and multivariate Normal Distribution;
 - ✦ Multiple linear regression and associated statistical inferences;
 - ✦ Multiple and partial correlation and their interpretations;
 - ✦ Analysis of variance.
 - ★ (Math B7600) *Advanced Topics in Statistics* (during Spring of 2016) covering
 - ✦ The general decision problem;
 - ✦ Application to hypothesis testing and estimation (including Bayesian methods);
 - ✦ Asymptotic evaluations of different inferential procedures;
 - ✦ Analysis of variance;
 - ✦ Regression models (including logistic regression) and associated inference.
 - ★ (Math A7800/47800) *Advanced Mathematical Statistics* (during Fall of 2015) covering
 - ✦ Theory of estimation;
 - ✦ Theory of hypothesis testing;
 - ✦ Introduction to multivariate analysis;
 - ✦ Introduction to linear models and statistical learning.

- ★ (Math B7700) *Stochastic Process II* (during Spring of 2015) covering
 - ✦ Discrete and continuous time Markov chains;
 - ✦ Poisson process and renewal theory;
 - ✦ Introduction to queueing theory;
 - ✦ Introduction to Brownian motion and Stochastic Calculus.
- for the undergraduate level courses
- ★ (Math 377) *Applied Statistics and Probability* (Fall of 2020) covering
 - ✦ Essentials of the R Language including data input and output, data frame, graphics, tables, and functions;
 - ✦ Simulation (using R) of random variables having various distributions ;
 - ✦ Organization of data: measures of central tendency, variability, and order statistics;
 - ✦ Understanding of hypothesis testing, p-values, and confidence intervals;
 - ✦ Basics of classical diagnostic and statistical tests (normality test, t-test, Chi-Squared test, correlation test, rank-based nonparametric tests, Kolmogorov-Smirnov test, etc.) using R.
 - ✦ Basics of the linear regression analysis using R;
 - ✦ Basics of the contingency table analysis (Kolmogorov’s exact test, goodness of fit test, etc.) using R;
 - ✦ Basics of the ANOVA (analysis of variance) using R;
 - ✦ Basics of the bootstrap and jackknife methods using R.
- ★ (Math 376) *Mathematical Statistics* (during Spring of 2021, 2019, and 2017) covering
 - ✦ Some Special Distributions;
 - ✦ Some Elementary Statistical Inferences;
 - ✦ Consistency and Limiting Distributions;
 - ✦ Maximum Likelihood Methods;
 - ✦ Sufficiency;
 - ✦ Optimal Tests of Hypotheses.
- ★ (Math 366) *Introduction to Applied Mathematics* (during Spring of 2017, and Fall of 2014) covering
 - ✦ A collection of algorithms and pseudo-codes in applied linear algebra;
 - ✦ Method of least squares;
 - ✦ Introduction to coding in Matlab;
 - ✦ Applications in image processing.
- ★ (Math 346) *Linear Algebra* (during Spring of 2019)
- ★ (Math 203) *Calculus III* (during Fall of 2014).
- ▶ **Instructor** at the *Courant Institute of Mathematical Sciences*
 - ★ (2011 - 2013) for the undergraduate *Calculus II* course.
- ▶ **Instructor** at the *Dept. of OR & IE of Cornell University*
 - ★ (Summer 2009 and 2010) for the course “*Introduction to Stochastic Process I*”, which is offered for Master of Engineering and senior undergraduate students and covers
 - ✦ Discrete and continuous time Markov chains;
 - ✦ Poisson process and renewal theory;
 - ✦ Introduction to queueing theory.
- ▶ **Teaching Assistant** (at the *Dept. of OR & IE of Cornell University*)
 - ★ (Spring 2010) for the graduate courses “*Nonlinear Programming*”.
 - ★ (Fall 2007 and Fall 2008) for the graduate/advanced undergraduate course “*Engineering Probability and Statistics*” .

★ (Summer 2007) for the undergraduate course “*Basic Engineering Probability and Statistics*”.

◆ **PEER-REVIEWED CONFERENCE TALKS:**

- 54. *CompleNet 2020*, the 11th International Conference on Complex Networks at the *Exeter, UK*, April 2020.
- 53. *Complex Networks 2019*, the 8th International Conference on Complex Networks & Their Applications at the *Calouste Gulbenkian Foundation, Lisbon, Portugal*, December 2019.
- 52. *Joint Statistical Meeting* at the *Baltimore Convention center, Baltimore, USA*, August 2017.

◆ **INVITED TALKS IN CONFERENCES AND WORKSHOPS**

- 51. *Joint Statistical Meeting* at the *Colorado Convention Center, Denver, CO, USA*, July 2019.
- 50. *Joint Statistical Meeting* at the *Vancouver Convention Center, Vancouver, BC, Canada*, August 2018.
- 49. *Frontier Probability Days* at the *Oregon State University, Corvallis, OR, USA*, March 2018.
- 48. *ISI-Networks Conference in Probability* at the *Indian Statistical Institute, Kolkata, WB, India*, January 2018.
- 47. *Dynamics on Random Graphs and Random Maps* at the *Centre International de Rencontres Mathématiques, Marseille, France*, October 2017.
- 46. *2016 International Indian Statistical Association Conference* at the *Oregon State University, Corvallis, OR, USA*, August 2016.
- 45. *Interplay of Stochastic and Deterministic Dynamics in Networks* at the *Mathematical Biological Institute, Columbus, OH, USA*, February 2016.
- 44. *Session on “Discrete Stochastic Models”* at the *AMS Sectional Meeting, Michigan State University, East Lansing, MI, USA*, March 2015.
- 43. *Limit Theorems in Probability*, *Indian Institute of Science, Bengaluru, KA, India*, January 2013.
- 42. *Workshop on “Dynamics on Networks”*, *Statistical and Applied Mathematical Science Institute, Durham, NC, USA*, March 2011.

◆ **INVITED TALKS IN COLLOQUIA/SEMINARS**

- 41. Probability Seminar, Statistics and Mathematics Unit, *Indian Statistical Institute, Kolkata, WB, India*, August 2019.
- 40. Probability Seminar, Department of Mathematics, *Cornell University, Ithaca, NY, USA*, October 2018.
- 39. Probability Seminar, Department of Statistics, *Ohio State University, Columbus, OH, USA*, November 2018.
- 38. Probability Seminar, Statistics and Mathematics Unit, *Indian Statistical Institute, Kolkata, WB, India*, August 2018.
- 37. Eindhoven Stochastics Seminar, Dept. of Mathematics, *Eindhoven University, Eindhoven, Netherlands*, October 2017.
- 36. Probability Seminar, Statistics and Mathematics Unit, *Indian Statistical Institute, Kolkata, WB, India*, January 2017.
- 35. Probability Seminar, Dept. of Mathematics, *Eindhoven University, Eindhoven, Netherlands*, June 2016.
- 34. Combinatorics and Probability Seminar, Dept. of Mathematics, *the Ohio State University, Columbus, OH, USA*, January 2016.
- 33. Probability Seminar, Dept. of Mathematics, *Cornell University, Ithaca, NY, USA*, November 2015.

32. Probability Seminar, Dept. of Mathematics, *University of Illinois, Urbana-Champaign, IL, USA*, March 2015.
31. Applied Probability Seminar, Dept. of Statistics, *Columbia University, New York, NY, USA*, October 2014.
30. Statistical Physics Seminar, Dept. of Statistics, *University of Warwick, Coventry, UK*, May 2014.
29. Probability Seminar, Dept. of Mathematics, *University of Minnesota, Minneapolis, MN, USA*, April 2014.
28. Dept. of Mathematics, *City College of New York, New York, NY, USA*, March 2014.
27. Dept. of Mathematics, *University of Delaware, Newark, DE, USA*, January 2014.
26. Dept. of Mathematics, *University of Massachusetts, Amherst, MA, USA*, January 2014.
25. Dept. of Mathematics, *Iowa State University, AMES, IA, USA*, January 2014.
24. Probability Seminar, Dept. of Mathematics, *University of Chicago, Chicago, IL, USA*, December 2013.
23. Probability Seminar, Dept. of Mathematics and Computer Science, *Eindhoven University of Technology, Eindhoven, Netherlands*, June 2013.
22. Mathematical Physics and Probability Seminar, Dept. of Mathematics, *University of California, Davis, CA, USA*, April 2013.
21. Dynamical Systems Seminar, *Courant Institute of Mathematical Sciences, New York University, New York, NY, USA*, October 2012.
20. Probability Seminar, Dept. of Mathematics, *Stockholm University, Stockholm, Sweden*, August 2012.
19. Probability Seminar, Dept. of Statistics & Operations Research, *University of North Carolina, Chapel Hill, NC, USA*, March 2012.
18. Probability Seminar, Statistics and Mathematics Unit, *Indian Statistical Institute, Kolkata, WB, India*, January 2012.
17. Probability Seminar, Dept. of Mathematics, *Cornell University, Ithaca, NY, USA*, April 2011.
16. Probability and Mathematical Physics seminar, *Courant Institute of Mathematical Sciences, New York University, New York, NY, USA*, December 2010.
15. Probability Seminar, Dept. of Mathematics, *Duke University, Durham, NC, USA*, October 2010.
14. Probability Seminar, *Indian Statistical Institute, Kolkata, WB, India*, January 2010.
13. Probability Seminar, Dept. of Mathematics, *Cornell University, Ithaca, NY, USA*, April 2009.
12. *Invited talk at PCM International Symposium on Statistics, Indian Statistical Institute, Kolkata, WB, India*, June 2006.

♦ **CONTRIBUTED TALKS:**

11. CUNY Probability Seminar, Dept. of Mathematics, *Graduate Center, City University of New York, New York, NY, USA*, March 2018.
10. CUNY Probability Seminar, Dept. of Mathematics, *Graduate Center, City University of New York, New York, NY, USA*, November 2015.
9. Probability and Mathematical Physics Seminar, Dept. of Mathematics, *New York University, New York, NY, USA*, November 2013.
8. Probability and Mathematical Physics Seminar, Dept. of Mathematics, *New York University, New York, NY, USA*, October 2012.
7. Ninth Northeast Probability Seminar, *City University of New York, New York, NY, USA*, November 2010.

6. Opening Workshop on Complex Networks, *Statistical and Applied Mathematical Science Institute, Durham, NC, USA*, August 2010.
5. Arizona School of Analysis with Applications, *University of Arizona, Tucson, AZ, USA*, March 2010.
4. Summer School in Probability, *Pacific Institute of Mathematical Sciences, Vancouver, BC, Canada*, July 2009.
3. Seminar in Stochastic Processes, *Stanford University, Palo Alto, CA, USA*, March 2009.
2. Second Graduate Student Conference in Probability, *University of Wisconsin, Madison, WI, USA*, May 2008.
1. Sixth Northeast Probability Seminar, *City University of New York, New York, NY, USA*, Nov 2007.

◆ AWARDS, SCHOLARSHIPS, FELLOWSHIPS, RECOGNITIONS

- ▶ **Stewart Travel Award**, CUNY, 2018.
- ▶ “**Salute to Scholars**” recognition, CUNY, 2016, for outstanding scholarly achievement and contributions to the creation and transmittal of knowledge.
- ▶ **Graduate Fellowship**, School of Operations Research & Information Engineering, Cornell University, *Aug 2006 - Jul 2007*.
- ▶ **SHUM Award**, School of Operations Research & Information Engineering, Cornell University, *Aug 2006 - Jul 2008*.
- ▶ Awards in addition to scholarships for excellent performances in every semester of my bachelors (B.Stat) and masters (M.Stat) programs, Indian Statistical Institute, 2001-2006.

◆ OUTREACH ACTIVITIES: Mentored five students outside CUNY for research activities.

▶ K-12 OUTREACH ACTIVITIES:

- ★ (Spring 2020 and Summer 2020) Mentored senior high school student Mathew Jacob (Northern Highlands Regional High School, Allendale, NJ) for a project “Simulation studies of epidemic models relevant for Covid-19”.
- ★ (2017 - 2019) Volunteered as a math tutor for some at-risk junior high school students from minority community.

▶ COMMUNITY OUTREACH ACTIVITIES:

- ★ (Spring 2020 and Summer 2020) Mentored undergraduate students Eva Guo (Univ. of Rochester, NY), Kim Mishra (NYU), and Hillary Gao (NYU) for a project “Simulation studies of epidemic models relevant for Covid-19”; and Praveen Ravisankar (UC Irvine) for a project on “Machine learning procedures to develop Covid-19 disease prognosis prediction”.
- ★ (2019 - present) Volunteer as a mentor with the *American Foundation for the Blind* aimed at students with visual disabilities to teach and motivate in exploring mathematics and related fields as a future career path.

◆ OTHER ACHIEVEMENT

- ▶ Ranked fourth in *Regional Mathematics Olympiad* within the state of West Bengal, India, 1999-2000.
- ▶ Ranked within top ten in *Mathematics Talent Search* in the state of West Bengal, India, 2000-01.