KIRAN SHARMA

Assistant Professor @ BML Munjal University
67th Milestone, National Highway - 8
Sidhrawali, Gurugram, Haryana -122413
E-mail: kiran.sharma@bmu.edu.in ; kiransharma1187@gmail.com
Skype: kiransharma48@gmail.com
Homepage: https://kiransharma.netlify.app/

Research Interest

My research is driven by the analysis of data from complex systems. My goal is to extract meaningful patterns from these data to uncover rules and mechanisms governing their structure and dynamics. Using tools from network theory, machine learning and data science, I investigate the several facets of scientific impact, social phenomena and financial market. I am interested in the broad areas of data science, network science, computational social science, econophysics, science of science, and bibliometrics.

Appointments

- **Assistant Professor**, BML Munjal University (BMU), India (March 2021-now)

- **Postdoctoral Fellow**, Northwestern University, USA (Nov 2019- March 2021)
        (Mentor: Prof. Luís A. N. Amaral)

- **Assistant Professor**, Lovely Professional University (LPU), India (Jan 2011- April 2014)

Education

- **Ph. D.**, Jawaharlal Nehru University (JNU), New Delhi, India (2019)
        (Supervisor: Prof. Anirban Chakraborti)
- **M.C.A.**, Panjab University, Chandigarh, India (2010) – (76.8%)
- **B. Sc. (Computer Science)**, D.A.V. College, Guru Nanak Dev University, Punjab, India (2007)—(63.8%)
- **10+2 (Non-Med):** Punjab School Education Board (2004) – (64.4%)
- **10th:** Punjab School Education Board (2002) --(76.9%)

Awards/Grants

- HMCL-BMU research grant of 3 Lakhs for developing a portal.
- HMCL-BMU research grant of 1 Lakh for research project.
- Full Travel grant from ICSSR, New Delhi, India (2017)
- Honorable Mention for poster, Chennai Mathematical Institute, India (2016)
- Best speaker award, SCIS, JNU, New Delhi, India (2016)
- Young Investigator Training Award, Matera, Italy (2016)
- Senior Research Fellowship (2016-2019)
- Junior Research Fellowship (2014-2016)
- National Eligibility Test (2013)

Scientific/Professional Activities

- Member of Complex Systems Society (2018-2020)
  Reviewer for the journals: (i) Chaos, Solitons & Fractals, (ii) JSTAT, (iii) Applied Network Science, (iv) Scientific Reports, (v) Complexity, (vi) Education and Information Technologies, (vii) Journal of American College of Cardiology, (viii) Physica A- Statistical Mechanics and Its Applications, (ix) Journal for Engineering Education Transformations, and (x) Scientometrics

- Eds. "New Perspectives and Challenges in Econophysics and Sociophysics" (Springer, Cham, 2019).

Programming Skills

Python, R, MATLAB

Publications

Google scholar: https://scholar.google.com/citations?hl=en&user=-3cqe3MAAAAJ

Peer-reviewed Journals

1. (2021) **K. Sharma**, *"Team size and retracted citations reveals the patterns of retractions from 1981-2020"*, *Scientometrics*, 126(10), 8363-8374.
2. (2021) K. Sharma and P. Khurana, "*Growth and dynamics of Econophysics: A bibliometric and network analysis*", *Scientometrics, 126*(5), 4417-4436.
3. (2020) A. Chakraborti, **K. Sharma**, H. K. Pharasi, K. S. Bakar, S. Das, T. H. Seligman, *"Emerging spectra characterization of catastrophic instabilities in complex systems"*, New J. Phys. **22**: 063043.
4. (2020) A. Chakraborti, Hrishidev, **K. Sharma**, and H. K. Pharasi, *"Phase separation and scaling in correlation structures of financial markets"*, J. Phys. Complexity, **2** ,015002.
5. (2020) S. S. Husain, **K. Sharma**, V. Kukreti and A. Chakraborti, *"Identifying the global terror hubs and vulnerable motifs using complex network dynamics",* Physica A, **540**, 123113.
6. (2018) H. K. Pharasi, **K. Sharma**, R. Chatterjee, A. Chakraborti, F. Leyvraz, and T. H. Seligman, *"Identifying long-term precursors of financial market crashes using correlation patterns"*, New J. Phys. **20**: 103041.
7. (2018) **K. Sharma**, Anamika, A. S. Chakrabarti, A. Chakraborti and S. Chakravarty, *"The Saga of KPR: Theoretical and Experimental developments"*, Science and Culture (Kolkata) **84:** 31-36.
8. (2017) **K. Sharma**, B. Gopalakrishnan, A. S. Chakrabarti and A. Chakraborti, "*Financial fluctuations anchored to economic fundamentals: A mesoscopic network approach*", *SCIENTIFIC REPORTS* **7**: 8055.
9. (2017) **K. Sharma**, G. Sehgal, B. Gupta, G. Sharma, A. Chatterjee, A. Chakraborti and G. Shroff*, "A complex network analysis of ethnic conflicts and human rights violations"*, *SCIENTIFIC REPORTS* **7**: 8283.
10. (2016) A. Chakraborti, D. Raina and **K. Sharma**, "*Can an interdisciplinary field contribute to one of the parent disciplines from which it emerged?*", Eur. Phys. J. Special Topics **225**, 3127-3135.

Peer-reviewed Conference Proceedings

1. (2021) P. Khurana, G. Geetha, G. Kumar, and **K. Sharma**, "A bibliometric analysis to unveil the impact of digital object identifiers (DOI) on bibliometric indicators", Proceedings of IC4S-2021 (Third International Conference on Computing, Communication and Cyber-Security).

2. (2018) **K. Sharma**, S. Das and A. Chakraborti, *"Global income inequality and savings: A data science perspective"*, Proceedings of the 5th IEEE International Conference on Data Science and Advanced Analytics, 496-503.

3. (2018) G. Sehgal, **K. Sharma**, A. Chatterjee and A. Chakraborti, *"Spatio-temporal networks of social conflicts: analysis and modeling"*, Proceedings of the IEEE/ACM International Conference on Advances in Social Networks Analysis and Mining, pages: 740-743 (ASONAM 2018).

Book Chapters

1. (2022) P. Khurana and **K. Sharma,** "Exploring the role of AI, IoT and Blockchain during Covid-19: A bibliometric analysis", submitted in edited book named, Computational Methods and Applications in Healthcare Domain, CRC Press, Taylor & Francis.

2. (2020) **K. Sharma** and A. Chakraborti, "*Physicists' approach to studying socio-economic inequalities: Can humans be modelled as atoms?"* in Ed. Ashmita Gupta, Social Statistics: Manifestation of Growth (Primus Books, 2020) pages:130-155.

3. (2019) **K. Sharma**, A.S. Chakrabarti and A Chakraborti, *"Multi-layered network structure: Relationship between financial and macroeconomic dynamics"*, published in Eds. F. Abergel et al., New Perspectives and Challenges in Econophysics and Sociophysics (Springer, Cham), pages: 117-131.

4. (2019) H.K. Pharasi, **K. Sharma**, A Chakraborti and T.H. Seligman, "Complex market dynamics in the light of random matrix theory"", published in Eds. F. Abergel et al., New Perspectives and Challenges in Econophysics and Sociophysics (Springer, Cham), pages: 13-34.

5. (2019) S. S. Husain, and **K. Sharma**, *"Dynamical evolution of anti-social phenomena: A data science approach"*, published in Eds. F. Abergel et al., New Perspectives and Challenges in Econophysics and Sociophysics (Springer, Cham), pages: 241-255.

6. (2017) **K. Sharma**, S. Shah, A.S. Chakrabarti and A. Chakraborti, "*Sectoral co-movements in the Indian stock market: A mesoscopic network analysis*", In Y. Aruka and A. Kirman (Eds.), Economic Foundations for Social Complexity Science, pages: 211-238.

7. (2017) J. L. Léonard, E. Heinsalu, M. Patriarca, **K. Sharma**, A. Chakraborti, *"Patterns of linguistic diffusion in space and time: the case of Mazatec",* Abergel, F., Aoyama, H., Chakrabarti, B.K., Chakraborti, A., Deo, N., Raina, D., Vodenska, I. (Eds.), "Econophysics and Sociophysics: Recent Progress and Future Directions" (Springer-Verlag, Milan) pages:227-251.

Pre-prints

- (2022) S. Sharma and K.Sharma, "Mountain environmental sustainability: Environmental consensus and a systemic spatiotemporal literature review analysis (1990-2020)". (Communicated).
- (2022) **K. Sharma** and P. Khurana, "Gender diversity in Covid-19 retracted publications". (Communicated)
- (2021) P. Khurana, G. Geetha, G. Kumar, and **K. Sharma**, "A weighted unified informetrics based on Scopus and WoS", arXiv: 2106.01232v1 (under review).
- (2021) P. Khurana and **K. Sharma**, *"Impact of h-index on authors ranking: An improvement to the h-index for lower-ranked authors",* arXiv: 2105.08281 (under review).
- (2021) P. Khurana, G. Geetha, G. Kumar, and **K. Sharma**, "*Proof of Reference (PoR): A unified informetrics based consensus mechanism*", arXiv: 2107.00214.
- (2021**) K. Sharma** and P. Khurana, "*Emerging trends and collaboration patterns unveil the scientific production in blockchain technology: A bibliometric and network analysis from 2014-2020*", arXiv: 2110.01871.

Research Coverage/ News Article

- (2020) Current Science Reports, "Tackling Terror". Doi: 10.1016/j.jclepro.2019.119133
- (2021) Current Science Reports, "Paper Retractions". Doi: 10.1007/s11192-021-04125-4
- (2021) Why the Nobel Prize in Physics going complex systems way will change the way we look at science in India. https://www.edexlive.com/opinion/2021/nov/01/why-the-nobel-prize-in-physics-going-complex-systems-way-will-change-the-way-we-look-at-science-25259.html

Invited Talks
- Talk on "Science of Science: A data science approach to assess and quantify the research impact" @ UNAM Mexico (2022)
- Talk on "Network Science Approaches to Social Systems" @ Lyallpur Khalsa College Technical Campus, Jalandhar (2021)
- Talk on "Science of Science: A data science approach to assess and quantify the research impact" @ VIPS-TC College of Engineering (2021)
- Symposium on "New Trends in Applied Mathematics: From Biology to Finance", JNU, India (2017)
- Symposium on "Economics, Physics and Finance", CIC A.C., UNAM, Cuernavaca, Mexico (2017)
- Gathering: "Correlations in Time Series and Many-Body Systems" CIC A.C., UNAM, Mexico (2017)
- Conference "RMT, Time Series and Many-Body Systems", CIC A.C., UNAM, Mexico (2017)
- Chennai Mathematical Institute, Chennai, India (2017)

Contributed Talks and Posters
2019
- Talk: "Criticality on networks and socio-economic systems", CCS2019, Singapore
- Poster: CCS2019, Singapore
2018
- Talk: "Network Science in economics and Finance", IIM, India

- Talk: "Statistical Methods in Finance", Chennai Mathematical Institute, India
- Talk: CNDS2018, JNU, New Delhi
- Talk: IEEE DSAA 2018, Torino, Italy
- Talk: "Machine learning, data analytics and modelling, Thessaloniki, CCS2018, Greece
- Talk: "Understanding opinion and language dynamics using massive data", CCS2018, Greece
- Talk: "Complexity of Conflicts and Crime", Thessaloniki, CCS2018, Greece
- Talk: Complex Systems CCS2018, Thessaloniki, Greece
- Workshop: Young researcher CCS warm-up school on complex systems, Thessaloniki, Greece

2017
- Talk: "Mesoscopic Networks in Complex Socio-economic Systems", JNU, New Delhi, India
- Poster: "Statistical Methods in Finance 2017", Chennai Mathematical Institute, Chennai, India
- Poster: "SCIENTEGRATION-2017", SCIS, JNU New Delhi, India
- Poster: "National Science day 2017", JNU New Delhi, India

2016
- Talk: ''SCIENTEGRATION-2016', SCIS, JNU New Delhi, India.
- Talk: "International Conference on Data Science Challenges", Matera, Italy.
- Poster: "Statistical Methods in Finance 2016", Chennai Mathematical Institute, India
- Poster: "Statphys Kolkata-IX", India
- Poster: "Statphys26-Lyon", France

Organizing Committee Member
- BMU-Aston one day research symposium (2021)
- BMU-BCU Diwali Lecture Series (2021)
- Conference **"**Econophys-2017 and APEC-2017", organized by JNU and DU (2017)
- Symposium "Apps of Pattern Recognition & Machine Learning in Medical Science", JNU (2017)
- Joint Panel discussion, JNU and Heidelberg University on "Big Data Science" (2017)
- Conference "*ECONOPHYS-2015"*, organized by Jawaharlal Nehru JNU and DU (2015)

Workshop Conducted
- Hands-on workshop: "Data Science in Sociology" by CMI and IISA, Chennai, India (2018)
- Hands-on workshop: "Data Science in Finance" by CMI and IISA, Chennai, India (2018)
- Hands-on workshop: "Network Science for beginners" by M&CEC, JNU, India (2018)
- Hands-on workshop: "Statistical Computing in R" by M&CEC, JNU, India (2018)

Academic Visits/Collaborations
- **India:** IMSc, IIMA, IITM, CMI, IISER (Pune), ISI (Chennai), IIAS (Shimla)
- **Mexico:** ICF- National Autonomous University of Mexico, University of Guadalajara
- **Europe**: Politecnico di Torino (Italy), Scuola Normale Superiore (Italy), Ecole Centrale Paris (France), Padova University (Italy)

Teaching Experience
- Data Science of Complex Systems—IITM (2022)
- Python Programming -- BMU (2022)
- Data Science of Complex Systems, Data Structure, C programming, Object Oriented Programming—BMU (2021)
- Tutor: 'R programming and Network science for beginners', JNU (2018)
- Tutor: 'Application of Network Theory in Social Sciences', JNU (2018)
- Teaching assistant: 'Introduction to R programming', JNU (2016)

- Subjects at Undergraduate level: Programming in C, C++, and Data Structure (LPU, 2011-2014)

Professional Development

- Attended and complete FDP on "Data Sciences" from 31 May-04 June 2021 under the banner of AICTE Training and Learning (ATAL) Academy.
- Attended and complete FDP on "Industry Oriented FDP on Artificial Intelligence" from 7-11 June 2021 under the banner of AICTE Training and Learning (ATAL) Academy.
- Attended and complete FDP on "Refresh Your Mind Through Meditation" from 12-16 July 2021 under the banner of AICTE Training and Learning (ATAL) Academy.
- Attended the Summer school on **Science of Science** from July 26 – Aug 6, 2021.
- Attended the National Workshop on **Solid Waste Management** organized by Delhi Science and Technology Cluster Project (DRIIV) IIT Delhi, July 30-31, 2021.

Personal Information
- **Fathers' Name:** Safri Ram
- **Mother's Name:** Neelam Sharma
- **DOB:** January 01, 1987
- **Category:** ST
- **Gender:** Female
- **Permanent Address:** #C114/12, New Satnampura, Street No 1A, Phagwara-144401, Punjab
- **Mobile:** 8130030929
- **Marital Status:** Single
- **Nationality:** Indian
- **Language:** English, Hindi and Punjabi