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AREA OF INTEREST

Machine Learning, Intelligent Transportation System, Federated Learning, Video Analysis, Video Captioning, Networks, Network Reconstruction, Social Network Analysis, Complex Networks, Graph Spectra, Time Varying Networks, Recommender Systems, Opinion Dynamics, Data Analytics, Mathematical Modeling of Epidemic Spreading, Efficient routing in Communication Networks.

TEACHING EXPERIENCE

- Associate Professor in CSE Department, **NIT Delhi** since Jul 21, 2022
- Assistant Professor in CSE Department, **NIT Delhi, Delhi** from December 12, 2014 to Jul 20, 2022
- Assistant Professor in CSE Discipline, **PDPM Indian Institute of Information Technology Design and Manufacturing, Jabalpur** -482 005, from Aug. 12, 2013 to December 11, 2014.
- Worked as Assistant Professor in Computer Science & Engineering Department w.e.f. 1st June 2007 to Dec. 2008, Senior lecturer: 1st March, 07 - 31st May, 07 and Lecturer: August, 2002-February, 2007 in “Maharaja Agrasen Institute of Technology”, Sec.-22, Rohini, Delhi, India (under G.G.S.I.P. Univ., Delhi).
- Worked as Lecturer in “Ajay Kumar Garg Engineering College”, Ghaziabad, India (Under U.P. Technical Univ., Lucknow) : August, 2001,- July 2002) .
- Worked as a tutor and TA for ESc 102 lab (Basic Electronics) in IIT Kanpur.
- Worked as a tutor and TA for EE673 (Digital Communication Networks) in IIT Kanpur.
- Worked as tutor for CS220 (Computer Organization) in IIT Rajasthan.
- Worked as TA for EE629 (Digital Switching) and EE646 (Photonic Networks and Switching).

RESEARCH AREAS

Information dynamics in correlated and uncorrelated Complex networks, Inoculation of nodes in Complex Networks, Dynamics on Networks using the community structure of Complex Networks, Epidemic modeling over human contact networks, Data Analytics, Video Captioning, Network Reconstruction

EDUCATIONAL QUALIFICATIONS

- **PhD from IIT Kanpur, India (CPI 8.5) (Nov2013)**
Thesis title: Rumor Dynamics and Inoculation of Nodes in Complex Networks.
Supervisor: Prof. Yatindra Nath Singh
- Master of Technology in **Information Technology** (GGSIPU, Delhi, India, Percentage – 76.26 %) *University School of Information Technology, Guru Gobind Singh Indraprastha University Delhi* in 2006.
- Bachelor of Engineering in **Computer Science & Engineering** (Dr. B.R. Ambedkar University, Agra, Percentage – 75 %) *Faculty of Engineering & Technology, R.B.S. College, Bichpuri, Agra, India* in 2000
- Intermediate (UP Board, Percentage – 73.4 %) *Pt. Deendayal Upadhyay Sanatan Dharam Vidyalaya, Kanpur, India.*1994
- High School (UP Board, Percentage – 79.16 %) *Pt. Deendayal Upadhyay Sanatan Dharam Vidyalaya, Kanpur, India* in1992

WORKSHOPS /SUMMER SCHOOLS/CONFERENCES ATTENDED

- **JTG summer school** at IISc. Bangalore, India, 18-21 May, 2010.
- **ACM SIGCOMM2010 International Conference**, New Delhi, India, August-September, 2010.
- **Workshop on Network Science** at IISc Bangalore, India, August 29- September 02, 2011.
- **School on Network Science in Electrical Engineering and Computer Science** at IISc Bangalore, India, 02-06 January, 2012.
- **Workshop on Network Science in Electrical Engineering and Computer Science** at IISc Bangalore, India, 09-13 January, 2012.

- **World Wide Web 2012** Conference at Lyon, France, 16-20 April, 2012.
- **ACM SIGCOMM 2012** International Conference, Helsinki, Finland, 10-13 December, 2012.
- **ACM CoNEXT 2012** International Conference, Nice, France, 13-17 August, 2012.
- **ACM COMSNETS 2013** International Conference, Bangalore, India, 7-10 January, 2013.
- **NCC 2013** Conference, IIT Delhi, India, 15-17 February, 2013.
- **COCOON 2013** Conference, Hangzhou, China, June 21-24, 2013.
- **ICEIT** Conference on Advances in Mobile Communications, Networking and Computing, New Delhi, 27-28 Sept 2013.
- **SITIS 2013** December 2-5, 2013, Kyoto, Japan.
- **SITIS 2015** November 23-27, 2015, Bangkok, Thailand.
- **Network and Games** workshop at IIT Ropar on December 1, 2015.
- Short Term Course on Deep Learning and Computational Intelligence in Automation & Control at IIT Kanpur from Dec. 4-8, 2017.
- ICTS program "**Dynamics of Complex Systems - Workshop**" scheduled to be held from June 26 - 30, 2018 at ICTS-TIFR, Bengaluru.
- 11th International Conference on Complex Networks and their Applications, during Nov. 8-10, 2022 at Palermo, Italy.
- One week research visit in **Rey Juan Carlos University, Spain** in Jan. 2023.
- IEEE- INDICON, 2023, Hyderabad (14-17, Dec., 2023)

PRESENTATIONS

- ❖ Delivered presentation under the student presentation at **JTG summer school, IISc**, Bangalore, India, 18-21 May, 2010.
- ❖ Presented my research paper on "Rumor Spreading and Inoculation of node in Complex Networks" in SWDM workshop in conjunction with **WWW2012** at Lyon, France, 16-20 April, 2012.

- ❖ Presented invited talk on “Dynamics of Information in Small world Networks” in Workshop on System Science: Complex Networks & Applications, at **IIT Rajasthan, Jodhpur**, India, 07-09 May, 2012.
- ❖ Presented invited talk on “Introduction to Complex network and rumor spreading in social networks” in Networking and Communication Seminar, at **TITE, Bhubneshwar**, India, 14 Sept. 2012.
- ❖ Paper presented on “Rumor dynamics and Inoculation strategies for Rumor Control in Social Networks” in Ph.D. forum in COMSNETS 2013, 7-10, January, Bangalore, India.
- ❖ Taken expert lectures on DBMS in **IIITM Gwalior**.
- ❖ Paper presented on “Rumor dynamics with inoculations for correlated scale free networks” in NCC 2013, 15-17 Feb., IIT Delhi, India.
- ❖ Paper presented "Effects of Inoculation based on Structural Centrality on Rumor Dynamics in Social Networks, "**Computing and Combinatorics (COCOON 2013)**, June 21-24, 2013, Hangzhou, China.
- ❖ **Paper presented on “Rumor Dynamics and Inoculation of Nodes in Weighted Scale Free Networks with Degree - Degree Correlation” in SITIS 2013** December 2-5, 2013, Kyoto, Japan.
- ❖ **Expert lecture in Indraprastha Engineering College, Ghaziabad on “Complex Networks”.**
- ❖ Expert lecture in **International Conference on Recent Innovations in Information Communication and Technology on Nov. 21, 2015 at Ganga Institute of Technology & Management, Rohtak.**
- ❖ Paper presented on " An Efficient Method for Link Prediction in Complex Multiplex Networks, in "**Signal Image Technology and Internet Based Systems (SITIS), 2015 Eleventh International Conference**, November 23-27, 2015, Bangkok, Thailand
- ❖ Expert Talk on, “**Influence and Evolutionary dynamics on Social Networks**”, **Network and Games** workshop at IIT Ropar on December 1, 2015.
- ❖ Expert lecture on “Social Network Analysis” in **RKGIT Ghaziabad**, July 14 2016.
- ❖ Paper presented on “Immunization Strategies Based on the Overlapping Nodes in Networks with Community Structure” in **CSoNet 2016**”, Aug2-4, 2016, Ho-Chi Minh City, Vietnam

- ❖ Expert lecture on **Autonomy Preparation** at GH Rasoni Institute of Engg. And Technology, Pune on Sept. 10, 2016
- ❖ Delivered guest lecture on “Advanced Computer Network” in department of Information Technology at SRMS University, Bareilly on October 7, 2016.
- ❖ Participated as guest speaker in CPJ College, Delhi in National Conference on "Emerging Issues in Business & Technology" on Oct 8, 2016.
- ❖ Paper presented on "Modeling of Data Communication Networks using Dynamic Complex Networks and its Performance Studies." and session chair in **“Complex Networks 2016”**, Milan, Italy
- ❖ Delivered a technical talk on “Social Network Analysis”. In The IEEE-student branch of Dronacharya Group of Institution, Greater Noida on 17th Feb 2017.
- ❖ Delivered a talk on "Game Theory and its Applications" in One Week National Level Short Term Course (STC) on “Innovative trends in Computing Technology and Engineering” (ICTE) during 21st March to 25th March 2017 under TEQIP-II, MITS Gwalior.
- ❖ Delivered a talk on “Introduction to Game Theory”, in School of Computer & Systems Sciences, Jawaharlal Nehru University, New Delhi on July 7, 2017.
- ❖ Presented a research paper, “Optimal Local Routing Strategies for Community Structured Time Varying Communication Networks.” in 6th International Conference on Computational Social Networks (CSoNet 2017), August 3-5, Hong Kong China
- ❖ Delivered lecture on Pivot Tables in International Course on 'Post Graduate Diploma In Human Resource Planning And Development' affiliated with Guru Gobind Singh Indraprastha University, Delhi on Aug. 7, 2017.
- ❖ Delivered a lecture on Microsoft Excel on Aug. 23, 2017 to the participants of International Training Programme on Manpower Research.
- ❖ Delivered lecture on **Manpower Information System: Concepts and Issues** on 16th October 2017 at Delhi.

- ❖ Delivered lecture on Development of MIS on 17th October, 2017 to participants of International Training Programme on Manpower Research, Delhi.
- ❖ Delivered a lecture in Two day Seminar on "Applications of MATLAB in Engineering" on 13-14 July 2018 organized by the Dept. of Applied Science and humanities in RKGITM, Ghaziabad.
- ❖ Expert Talk in TEQIP Sponsored National Workshop 'Signal Processing & Computational Intelligence-2018 (SPCI-2018)', 17-21 Sept., 2018, DCRUST, Muruthal, Sonapat.
- ❖ Expert talk on Large Network Analysis in Moradabad Institute of Technology **(MIT), Moradabad** on Oct. 31, 2018.
- ❖ Delivered talk in the ICTS program "**Dynamics of Complex Systems - Workshop**" scheduled to be held from June 26 - 30, 2018 at ICTS-TIFR, Bengaluru.
- ❖ Expert Talk Short Term Course (STC) on "Intelligent Computing Techniques in Data Mining and Image Processing" (AICTE QIP Sponsored) during 1st to 5th February 2019, MITS Gwalior.
- ❖ Delivered a talk on "Social Network Analysis" during On-Campus Online Training for RGI Faculties [OOTP] on 23-May-20. **GHRIET, Wagholi, Pune, India.**
- ❖ Delivered a talk on "**Epidemic Modelling and Containment**", Online training program through Webinar on thrust areas in various domains of computer, Information Technology, Electrical, Electronics & Telecommunication, Civil & Mechanical Engineering, July 18, 2020, **GHRIET, Wagholi, Pune, India**
- ❖ Delivered a talk on Modeling and Analysis of COVID 19 data", One Week Faculty Development Programme On topic "Data Analytics: Present and Future" (12th to 16th Oct., 2020), MMMUT, Gorakhpur, India.
- ❖ Delivered a talk on "COVID-19 Modeling and its Containment", Faculty development programme (FDP) on "Technology as a Bridge in Different of Life During Covid -19" from 19th to 23th October 2020 at B.T Kumaon Institute of Technology, Dwarahat, India.
- ❖ Delivered a talk on "Federated Learning", Second Faculty Development Programme on Innovations and Research Trends in Artificial Intelligence, Banasthali Vidyapith, Rajasthan, India on March 7, 2021.

- ❖ Delivered a talk on “Mathematical Optimization in Healthcare”, ATAL FDP on Machine Learning Frontiers in Healthcare (MLFH-21), NIT Delhi, India on July 30, 2021.
- ❖ Delivered a talk on, “Community detection and Assortativity” One-week online Faculty Development Programme (FDP) on ‘Network Science: Theory, Challenges and Applications’ under the ATAL AICTE FDP programme from 23rd August 2021 to 27th August 2021 organized by Amity University Rajasthan, Jaipur, India.
- ❖ Guest Speaker for Three-Days International Conference on Recent Advances in Mathematics and Computational Optimizations(RAMCO-2021) jointly organised by SCIS, JNU and IAPS, Pragra, India, and talk was on, “Spectral Analysis in q-triangulation Networks for Calculating Hitting times” scheduled on October 26-28, 2021.
- ❖ Delivered a talk on “Federated Learning”, Faculty Development at CDAC Noida on Dec. 3, 2021.
- ❖ Delivered a talk on, “Information Security in MIS and Cloud Computing” a two weeks ONLINE International Training Programme (ITP) on ‘Manpower Information System (MIS)’ commenced from 29th November to 10th December, 2021 at National Institute of Labour Economics Research and Development (NILERD) Narela, Delhi.
- ❖ Delivered a talk on “Spectral Graph Theory” in Three-Day 5th International Conference on , “Recent Advances in Mathematical Sciences with Applications in Engineering and Technology” (IC-RA-MSA-ET-2022) on the occasion of Golden Jubilee Celebration of Vijnana Parishad of India (Society for Applications of Mathematics) on June 16, 2022.
- ❖ Delivered a research paper presentation on, “Quantum Walk Circuits to Analyze Networks” in 2022 8th International Conference on Advanced Computing and Communication Systems (ICACCS). Organized by Sri Eshwar College of Engineering, Coimbatore, Tamilnadu, India on March 25, 2022.
- ❖ Delivered a talk on, “Federated Learning”, in GH Rasoni Lecture series, G. H. Rasoni Institute of Engineering and Technology (GHRIET) Pune on April 12, 2022

- ❖ Delivered a talk on “**How to write Research Proposal in emerging area of Engineering & Technology**” at G L Bajaj Institute of Technology & Management, Greater Noida Delhi on Sept. 10, 2022.
- ❖ Delivered a talk on “Federated Learning” at SRM University, Amravati, AP on September 16, 2022.
- ❖ A research paper, “A Biased Random Walk Scale-Free Network Growth Model with Tunable Clustering” is presented in 11th International Conference on Complex Networks and their Applications, during Nov. 8-10, 2022 at Palermo, Italy.
- ❖ A research paper, “Mean Hitting Time of Q-subdivision Complex Networks” is presented in 11th International Conference on Complex Networks and their Applications, during Nov. 8-10, 2022, at Palermo, Italy.
- ❖ A research paper, “A Community Detection Algorithm Using Random Walk” is presented in the 11th International Conference on Computational Data and Social Networks at Tampa, Florida (virtual) on Dec. 7, 2022.
- ❖ Delivered a talk on, “Spectral Graph Theory” in an one day symposium in mathematics on the National Mathematics Day on 22nd December, 2022 (Ramanujan's birthday) at School of Physical Sciences (SPS), JNU Delhi.
- ❖ Delivered a talk on, “Optimization Techniques” at Lovely University on Nov. 15, 2022.
- ❖ Delivered a expert lecture on, “Optimization Techniques in Machine Learning” in online SEMINAR on "Artificial Intelligence Techniques for Healthcare Applications (AITHA-2023)", dated: 22Feb.-2023 to 27th Feb.-2023 (Feb. 25)” sponsored by SERB at NIT Delhi.
- ❖ Delivered a expert lecture on, “Federated Learning” in online SEMINAR on "Artificial Intelligence Techniques for Healthcare Applications (AITHA-2023)", dated: 22Feb.-2023 to 27th Feb.-2023 (Feb. 26)” sponsored by SERB at NIT Delhi.
- ❖ Delivered an expert lecture on, “Social Network Analysis”one-week Faculty Development Programme on "**Intelligent Computing and Communications**" as a **guest speaker** on **April 12th, 2023** at Banasthali Vidyapith, Rajasthan in **Offline mode**. This programme is fully supported by the **Department of Science and Technology (DST), Govt. of India** under the

scheme Consolidation of University Research for Innovation and Excellence in Women (CURIE).

- ❖ Delivered an expert talk on, “Social Network Analysis” in online monthly research meeting at Dept . of CSc, University of Delhi on May 24, 2023.
- ❖ A research paper on, “Detection of Violent Content in Videos Using 2D Attention-Augmented Convolutional Networks and Gated Recurrent Unit” is presented in IEEE- INDICON, 2023, Hyderabad (14-17, Dec., 2023)
- ❖ A keynote is delivered on “Introduction to Machine Learning “ in an International Conference on Communication, Security and Artificial Intelligence (ICCSAI-2023) from 23rd Nov to 25th Nov 2023 at Galgotia University, India.
- ❖ Research Presentation is delivered **Rey Juan Carlos University, Spain (Jan. 2023.)**
- ❖ Taught Compiler Design course in 2023 and 2022 at **South Asian University Delhi.**
- ❖ Taught DBMS course in **IIIT Kota** in 2023.
- ❖ An expert talk on, “Federated Learning in Computer Vision”, in **SERB High-End Workshop (KARYASHALA) on A Practical Approach to Machine Learning and Deep Learning for Computer Vision Applications using High End Computing Resources** from March 15 -22, 2024 at MLNIT Allahabad.

PUBLICATIONS

Journals

1. **Anurag Singh**, Y N Singh, "Nonlinear Spread of Rumor and Inoculation Strategies in the Nodes with Degree Dependent Tie Strength in Complex Networks," **Acta Physica Polonica B**, pages 5-28 Vol.44, No.1, 2013.
2. **Anurag Singh**, Y N Singh, "Rumor Dynamics in Weighted Scale Free Networks with Degree Correlations" **Journal of Complex Networks, Oxford University Press** , pages 450-468, Vol. 3, No. 3, 2015.
3. **Singh, Anurag**, Rahul Kumar, and Yatindra Nath Singh. "**Impact Of Structural Centrality Based Attacks In Complex Networks.**" **Acta Physica Polonica B 46.2 (2015).**

4. Naveen Gupta, **Anurag Singh**, Hocine Cherifi, Centrality measures for networks with community structure, *Physica A: Statistical Mechanics and its Applications*, Volume 452, 15 June 2016, Pages 46-59, ISSN 0378-4371.
5. Sharma, Shikhar, and **Anurag Singh**. "An efficient method for link prediction in weighted multiplex networks." *Computational Social Networks* 3.1 (2016).
6. Singh, V., **Singh, A.**, Jain, D., Kumar, V., & Verma, P. (2018). Patterns affecting structural properties of social networking site 'Twitter'. *International Journal of Business Information Systems*, 27(4), 411-432.
7. KUMARI, SUCHI, and **ANURAG SINGH**. "Time-Varying Network Modeling and its Optimal Routing Strategy." *Advances in Complex Systems*, Volume 21 (2) (2017): 1850006.
8. Goel, Rahul, **Anurag Singh**, and Fakhteh Ghanbarnejad. "Modeling Competitive Marketing Strategies in Social Networks." *Physica A: Statistical Mechanics and its Applications* 518 (2019): 50-70.
9. Niranjana, Utkarsh, **Anurag Singh**, and Ramesh Kumar Agrawal. "A mean-field-theoretic model for dual information propagation in networks." *Journal of Complex Networks* (2019).
10. S Kumari, **A Singh**, "Effect of Correlations on Routing and Modeling of Time-varying Communication Networks" *Acta Physica Polonica B* 50 (2), 199, (2019)
11. Kumari, Suchi, and Anurag Singh. "Fair end-to-end window-based congestion control in time-varying data communication networks." *International Journal of Communication Systems* 32.11 (2019): e3986.
12. Malik, Deepak, and **Anurag Singh**. "Link prediction in multilayer networks." *International Journal of Business Intelligence and Data Mining* 16.4 (2020): 490-505.
13. Kumari, Suchi, and **Anurag Singh**. "Effect of correlation on the traffic capacity of Time Varying Communication Network." *Modern Physics Letters B*, Vol. 33(26) (2019).
14. Shivam Bathla, Omprakash Sah Kanu, and **Anurag Singh**. "SHOMAN: An Efficient Method for Finding the Important Nodes in a Network." *Int. J. of Business Intelligence and Data Mining*, (Accepted in Jul 2019).

15. Kumar, Rajesh, and Anurag Singh. "Consensus dynamics on weighted multiplex networks: a long-range interaction perspective." *Journal of Statistical Mechanics: Theory and Experiment* 2019.11 (2019): 113402.
16. Kumari, Suchi, Abhishek Saroha, and **Anurag Singh**. "Efficient edge rewiring strategies for enhancement in network capacity." *Physica A: Statistical Mechanics and its Applications* (2019): Vol 545.
17. Eeti, **Singh, Anurag**, and Hocine Cherifi. "Centrality-based Opinion Modeling on Temporal Networks." *IEEE Access* 8 (2019): 1945-1961.
18. M. Arquam, **A. Singh** and H. Cherifi, "Impact of Seasonal Conditions on Vector-Borne Epidemiological Dynamics," in *IEEE Access*, vol. 8, pp. 94510-94525, 2020, doi: 10.1109/ACCESS.2020.2995650.
19. Arquam, Md, and **Anurag Singh**. "Epidemic Spreading in Geometric Network with Mobile Agents." *Acta Physica Polonica B* 51.9 (2020): 1853.
20. Arquam, M., **Singh, A.**& Sharma, R. A blockchain-based secured and trusted framework for information propagation on online social networks. *Soc. Netw. Anal. Min.* **11**, 49 (2021).
21. Kumar, Rajesh, **Anurag Singh**, and Manju Bala. "A secure and robust multilayer network with optimum inter layer links under budget constraints." *Multimedia Tools and Applications* (2021): 1-27.
22. Jain, Eeti, and **Anurag Singh**. "Opinion evolution in society with stubborn agents using Temporal Model for Opinion and Triad Network Formation (TMOTNF)." *Journal of Complex Networks* 9.5 (2021): cnab033.
23. **Singh, Anurag**, and Md Arquam. "Epidemiological modeling for COVID-19 spread in India with the effect of testing." *Physica A: Statistical Mechanics and its Applications* (2021): 126774.
24. Jain, Eeti, and **Anurag Singh**. "Trust-and reputation-based opinion dynamics modelling over temporal networks." *Journal of Complex Networks* 10.4 (2022): cnac019.
25. Kumar, Pankaj, Anurag Singh, and Ajay K. Sharma. "Identification of influential vertices in complex networks: A hitting time - based approach." *Concurrency and Computation: Practice and Experience*: e8031.

26. Singhal, A. K., & Singh, A. (2024). Mapping health pathways: A network analysis for improved illness prediction. *Concurrency and Computation: Practice and Experience*, e8301.
27. Singhal, A. K., Manhas, S., & Singh, A. (2025). Beyond the traditional models: a network reconstruction based model for predicting and analysing individual health status. *Computing*, 107(1), 1-21.
28. Prasad, R., Kumar, P., Singh, A., Sunil, A., Kumar, A., & Patra, A. (2025). Trend analysis of extreme wind and wave height at key port locations along the Indian coastline. *Thalassas: An International Journal of Marine Sciences*, 41(1), 1-23.

Conferences/ Workshops

1. **Anurag Singh**, R Kumar,, Y.N. Singh, "Rumor Dynamics with Acceptability Factor and Inoculation of Nodes in Scale Free Networks, "**Signal Image Technology and Internet Based Systems (SITIS), 2012 Eighth International Conference on**, vol., no., pp.798,804, 25-29 Nov. 2012.
2. **Anurag Singh** and Yatindra Nath Singh. 2012. Rumor spreading and inoculation of nodes in complex networks. InProceedings of the 21st international conference companion on **World Wide Web (WWW '12 Companion)**. ACM, New York, NY.
3. **Anurag Singh**, Y.N. Singh, "Rumor dynamics with inoculations for correlated scale free networks, **National Conference on Communications (NCC 2013)**, vol., no., pp.1,5, 15-17 Feb. 2013.
4. **Anurag Singh**, Rahul Kumar, Y N Singh, "Effects of Inoculation based on Structural Centrality on Rumor Dynamics in Social Networks, "**Computing and Combinatorics (COCOON 2013)**, Hangzhou, China, Lecture Notes in Computer Science Volume 7936, 2013, pp 831-840.
5. Amit Munjal, **Anurag Singh**, Yatindra Nath Singh, "Using Complex Network in Wireless Sensor Networks, "**Proc. ICEIT Conference on Advances in Mobile Communications, Networking and Computing**, New Delhi, 27-28 Sept 2013.
6. **Anurag Singh**, Yatindra Nath Singh, "Rumor Dynamics and Inoculation of Nodes in Weighted Scale Free Networks with Degree - Degree Correlation,

"Signal Image Technology and Internet Based Systems (SITIS), 2013 Ninth International Conference , December 2-5, 2013, Kyoto, Japan

7. Naveen Gupta and **Anurag Singh**. 2014. A Novel Strategy for Link Prediction in Social Networks. In Proceedings of the 2014 **CoNEXT on Student Workshop (CoNEXT Student Workshop '14)**. ACM, New York, NY, USA, 12-14.
8. Naveen Gupta, **Anurag Singh**, Hocine Cherifi, "**Community-based immunization strategies for epidemic control**," in **Communication Systems and Networks (COMSNETS), 2015** 7th International Conference on , vol., no., pp.1-6, 6-10 Jan. 2015.
9. Naveen Gupta, **Anurag Singh**, "**Predicting The Weights Of Future Connections In Social Networks**," in **Proc. ICEIT Conference on Advances in Mobile Communications, Networking and Computing**, New Delhi, April 16-17, 2015.
10. Shikhar Sharma, **Anurag Singh**, " An Efficient Method for Link Prediction in Complex Multiplex Networks, "**Signal Image Technology and Internet Based Systems (SITIS), 2015 Eleventh International Conference**, November 23-27, 2015, Bangkok, Thailand.
11. Suchi Kumari, **Anurag Singh**, and Priya Ranjan. 2016. Towards A Framework for Rate Control on Dynamic Communication Networks. In Proceedings of the International Conference on Internet of things and Cloud Computing (ICC '16), ACM, New York, NY, USA, , Article 12 , 7 pages.
12. Chakraborty, D., **Singh, A.**, &Cherifi, H., Immunization Strategies Based on the Overlapping Nodes in Networks with Community Structure. In International Conference on Computational Social Networks (pp. 62-73). Springer International Publishing, August 2016, Ho Chi Minh city, Vietnam.
13. Kumari, Suchi, and **Anurag Singh**. "Modeling of Data Communication Networks using Dynamic Complex Networks and its Performance Studies." **Complex Networks & Their Applications V: Proceedings of the 5th International Workshop on Complex Networks and their Applications (COMPLEX NETWORKS 2016)**. Vol. 693. Springer, 2016.
14. Suchi Kumari, **Anurag Singh**, Hocine Cherifi, "Optimal Local Routing Strategies for Community Structured Time Varying Communication Networks." (Accepted

for presentation and publication), CSoNet 2017 (Computational Social Network), Hong Kong, Aug.3-5, 2017.

15. **S. Kumari** and **A. Singh**, "Community structured time varying communication networks," 2018 10th International Conference on Communication Systems & Networks (COMSNETS), Bengaluru, 2018, pp. 513-515.
16. Kumar, M., **Singh, A.**, & Cherifi, H. (2018, April). An Efficient Immunization Strategy Using Overlapping Nodes and Its Neighborhoods. In Companion of the The Web Conference 2018 on The Web Conference 2018 (pp. 1269-1275). International World Wide Web Conferences Steering Committee.
17. Kumari, Prity, and **Anurag Singh**. "Approximation and Updation of Betweenness Centrality in Dynamic Complex Networks." *Computational Intelligence: Theories, Applications and Future Directions-Volume I*. Springer, Singapore, 2019. 25-37.
18. Kumar, Prem, Puneet Verma, and **Anurag Singh** ."A Study of Epidemic Spreading and Rumor Spreading over Complex Networks." Towards Extensible and Adaptable Methods in Computing. Springer, Singapore, 2018. 131-143.
19. Jain, Eeti, **Anurag Singh**, and Rajesh Sharma. "TTPROF: A Weighted Threshold Model for Studying Opinion Dynamics in Directed Temporal Network." International Workshop on Complex Networks and their Applications. Springer, 2018.
20. Arquam, Md, **Anurag Singh** , and Rajesh Sharma. "Modelling and Analysis of Delayed SIR Model on Complex Network." International Workshop on Complex Networks and their Applications. Springer, 2018.
21. Kumar, Rajesh, **Anurag Singh**, and Hocine Cherifi. "Effect of Topological Structure and Coupling Strength in Weighted Multiplex Networks." International Conference on Computational Social Networks. Springer, 2018.
22. **S. Kumari** and **A. Singh**, "Network Capacity Enhancement Over Time-Varying Communication Networks: A Survey and Inherent Directives" in **Proc. ICEIT Conference on Advances in Mobile Communications, Networking and Computing**, New Delhi, April 11-12, 2019.
23. Md. Arquam, **A. Singh**, "Challenges in Modeling of Communicable and Non-Communicable Diseases in Complex Network" in **Proc. ICEIT Conference on Advances in Mobile Communications, Networking and Computing**, New Delhi, April 11-12, 2019.

24. Rajesh Kumar, **A. Singh**, "Stability of Synchronization Processes in Weighted Multiplex Networks" in **Proc. ICEIT Conference on Advances in Mobile Communications, Networking and Computing**, New Delhi, April 11-12, 2019.
25. Eeti, **A. Singh**, "Threshold Time Varying Opinion Convergence" in **Proc. ICEIT Conference on Advances in Mobile Communications, Networking and Computing**, New Delhi, April 11-12, 2019.
26. Kumar, Prem, Puneet Verma, **Anurag Singh**, and Hocine Cherifi. "Choosing Optimal Seed Nodes in Competitive Contagion." *Frontiers in Big Data* 2 (2019): 16.
27. Arquam, Md, **Anurag Singh**, and Hocine Cherifi. "Integrating Environmental Temperature Conditions into the SIR Model for Vector-Borne Diseases." *International Conference on Complex Networks and Their Applications*. Springer, Cham, 2019.
28. Agrawal, Rimjhim, Md. Arquam, and **Anurag Singh**. "Community detection in Networks using Graph Embedding." *Procedia Computer Science* 173 (2020): 372-381.
29. Eeti, **Singh, Anurag**. "Effect of Influential Nodes on Time Varying Opinion Formation Models." *Procedia Computer Science* 173 (2020): 120-129.
30. Singh, Nidhi, **Anurag Singh**, and Rajesh Sharma. "Predicting Information Cascade on Twitter Using Random Walk." *Procedia Computer Science* 173 (2020): 201-209.
31. Trivedi, Nitesh, and **Anurag Singh**. "Efficient Influence Maximization in Social-Networks Under Independent Cascade Model." *Procedia Computer Science* 173 (2020): 315-324.
32. Kumar, Rajesh, and **Anurag Singh**. "Robustness in Multilayer Networks Under Strategical and Random Attacks." *Procedia Computer Science* 173 (2020): 94-103.
33. Singh, Anurag, and Binshumesh Sachan. "Quantum Walk Circuits to Analyze Networks." *2022 8th International Conference on Advanced Computing and Communication Systems (ICACCS)*. Vol. 1. IEEE, 2022.
34. Singh, A., Bhasin, S., Gakhar, B., & Arquam, M. (2022). Modeling the Effect of Quarantine and Isolation for COVID-19 Spreading. In *Artificial Intelligence and Sustainable Computing* (pp. 437-450). Springer, Singapore.

35. Singh, Anurag, and Binshumesh Sachan. "A quantum approach to walk on networks." *2021 6th International Conference on Signal Processing, Computing and Control (ISPCC)*. IEEE, 2022
36. A. Singh and B. Sachan, "Quantum Walk Circuits to Analyze Networks," 2022 8th International Conference on Advanced Computing and Communication Systems (ICACCS), Coimbatore, India, 2022, pp. 277-284, doi: 10.1109/ICACCS54159.2022.9785059.
37. Kumar, P., Singh, A., Sharma, A.K., Cherifi, H. (2023). Mean Hitting Time of Q-subdivision Complex Networks. In: Cherifi, H., Mantegna, R.N., Rocha, L.M., Cherifi, C., Micciche, S. (eds) *Complex Networks and Their Applications XI. COMPLEX NETWORKS 2016 2022*. Studies in Computational Intelligence, vol 1078. Springer, Cham. https://doi.org/10.1007/978-3-031-21131-7_28.
38. Vashishtha, R., Singh, A., Cherifi, H. (2023). A Biased Random Walk Scale-Free Network Growth Model with Tunable Clustering. In: Cherifi, H., Mantegna, R.N., Rocha, L.M., Cherifi, C., Micciche, S. (eds) *Complex Networks and Their Applications XI. COMPLEX NETWORKS 2016 2022*. Studies in Computational Intelligence, vol 1078. Springer, Cham. https://doi.org/10.1007/978-3-031-21131-7_10.
39. Vashishtha, R., Singh, A., Cherifi, H. (2023). A Community Detection Algorithm Using Random Walk. In: Dinh, T.N., Li, M. (eds) *Computational Data and Social Networks. CSoNet 2022. Lecture Notes in Computer Science*, vol 13831. Springer, Cham. https://doi.org/10.1007/978-3-031-26303-3_20.
40. P. Bharadwaj, R. Gupta, R. Gurjar and A. Singh, "Importance of CURE Clustering Algorithm over K-Means Clustering Algorithm for Large Data-set," 2023 Third International Conference on Secure Cyber Computing and Communication (ICSCCC), Jalandhar, India, 2023, pp. 421-426, doi: 10.1109/ICSCCC58608.2023.10177015.
41. B. Sajja and A. Singh, "Detection of Violent Content in Videos Using 2D Attention-Augmented Convolutional Networks and Gated Recurrent Unit," 2023 IEEE 20th India Council International Conference (INDICON), Hyderabad, India, 2023, pp. 967-972
42. A. K. Singhal, S. Manhas and A. Singh, "Health Prediction Using Network Reconstruction Based Model," *2024 16th International Conference on*

COMmunication Systems & NETworkS (COMSNETS), Bengaluru, India, 2024, pp. 409-411.

43. V. Sharma, A. Singh and S. Gaito, "Video Captioning using Spatio-temporal Graphs: An Encoder-Decoder Approach," *2024 16th International Conference on COMmunication Systems & NETworkS (COMSNETS)*, Bengaluru, India, 2024, pp. 424-426.
44. A. Singh, P. Singh, V. Sharma, D. Tyagi, N. Pandey and B. Vaid, "Palanam: A Deep Learning Based Childhood Defense System," *2024 16th International Conference on COMmunication Systems & NETworkS (COMSNETS)*, Bengaluru, India, 2024, pp. 273-275
45. V. Sharma, A. Singh and S. Gaito, "Object Centered Video Captioning using Spatio-temporal Graphs," *2024 IEEE International Conference on Interdisciplinary Approaches in Technology and Management for Social Innovation (IATMSI)*, Gwalior, India, 2024.

Ph.D. Forum

Anurag Singh "Rumor dynamics and Inoculation strategies for Rumor Control in Social Networks" accepted for presentation in Ph.D. forum in **COMSNETS 2013**, 7-10, January, Bangalore, India.

Book Chapters

1. **Anurag Singh**, Y N Singh "Rumor Dynamics and Inoculation of the Nodes in Complex Networks" book chapter entitled "**Complex Networks and their applications**" by **Cambridge Scholars Publishing**, January 2014.
2. Niranjan, Utkarsh, **Anurag Singh**, and Ramesh Kumar Agrawal. "Competitive Novel Dual Rumour Diffusion Model." *New Perspectives and Challenges in Econophysics and Sociophysics*. Springer, Cham, 2019. 229-240.

AWARDS & GRANTS

- **ACM SIGCOMM 2010 Travel Grant** to attend ACM SIGCOMM Conference at New Delhi, India (550 USD).
- **ACM SIGCOMM 2012 Travel Grant** to attend ACM SIGCOMM Conference at Helsinki, Finland (2000 USD).

- **ACM CoNEXT 2012 Travel Grant** to attend ACM CoNEXT Conference at Nice, France (2200 USD).
- Received cash award from IIT Kanpur for journal paper publication.
- **MHRD fellowship** for 4 years and 6 months.
- **M.Tech. student Naveen Gupta received best thesis award at PDPM IITDM Jabalpur.**
- SERB international travel grant for attending the CSoNet 2017 conference at Hong Kong.
- Elevated as IEEE Sr. Member in 2018.

SPONSORED PROJECTS:

1. **MATRICS, SERB, DST Project on “Mathematical Model for Multidimensional Multilayer Networks Using Quantum Mechanics”** started from Feb 20., 2020 and completed (Rs 6,60,000 for 3 years).
2. **MARICS SERB: A special call on COVID 19 modelling, “Development of Dynamic Mathematical Modeling for COVID-19 Spread and Containment” is accepted for MATRICS, SERB, DST.** (Rs 5,50,000 for 1 year, completed, July 2020, July 2021).
3. A startup grant of Rs 10,00,000 received in 2022 from TIH IIT Patna and a company, “Palanan Technology Pvt. Ltd.” is established for video analytics project.
4. Received Rs 1,18,00,000 under FIST 2023 program as Co-PI.
5. INCOIS Project on "Extended Forecast of Wind-wave Parameters along the Indian Coastline using Multi-tasking Machine-learning Techniques" (Rs. 17,31,000 Ongoing).

Ph.D. STUDENTS

- ❖ Such Kumari (**Completed on March 18, 2020**), “Modeling and Performance Study of Time-Varying Communication Network: A Complex System Approach”.
- ❖ Md. Arquam (Registered in Aug. 2016), “**Modelling of Disease and Information Dynamics in Complex Networks**” (Completed on April 4, 2022).

- ❖ Eeti (Registered in Jan. 2017), “**Performance analysis of Opinion Dynamics Models Over Time Varying Networks**” going on (Completed on May 31, 2022).
- ❖ Rajesh Kumar (Registered in Jan. 2017), “**Dynamics on Multilayer Networks: Synchronization and Robustness**” (Completed on April 28, 2023).
- ❖ Ankur Kumar Singhal (registered in 2022) Domain of work: “**Network Reconstruction**” (ongoing, Comprehensive done).
- ❖ Vibhor Sharma (registered in 2022), Part Time Domain of work: “**Video Captioning**” (ongoing, Comprehensive done).
- ❖ Shivank (registered in 2024), Domain of work: “**Effect of Climatic Conditions over Vector Borne Diseases**” (ongoing).

M.Tech. PROJECTS

1. Pankaj Kumar (with Prof.(Dr.) Ajay K. Sharma), **“Hitting Time and Consensus in Higher Ordered Network” (2023).**
2. Anupama Singh, **“Community Detection in Complex Networks” (2023).**
3. Pandla Balakrishna Vijay Kumar, **“A Study of Video Captioning using Spatio-temporal attention” (2023).**
4. Pawan Yadav (with Dr. Chandra Prakash), **“Efficient Communication Transportation System Using Federated Learning” (2023).**
5. Amit Kumar, NIT Delhi, **“Federated Learning” (2021-22).**
6. Ch Chaitanya, NIT Delhi, topic: **Intelligent Transport System for Buses**
7. Moh Khalid, NIT Delhi, topic: **Federated Learning Based Traffic Flow Prediction Using GCN**
8. Rimjhim Agrawal, topic: **Community Detection in Temporal Networks.**
9. Rekha Meena, topic: **Community detection with Spiking-Neural-Network.**
10. Nitesh Trivedi, topic: **Efficient Influence Maximization In Social Networks Under Independent Cascade Model**
11. Nishkal Prakash, topic: **Contemporary Political Frontier: Analysing Trends in Online Social Media using Politics Related Data from Twitter**
12. Manish Kumar, topic: **Efficient Immunization Strategy Using Overlapping Community Structure in Networks (2016-18)**
13. Nidhi Singh, topic: **Social Network Analysis and Text Mining on Twitter (2016-18)**
14. Rajesh Vashishtha, topic: **Network Modeling and Community Detection Algorithm (2015-2017)**
15. Mithun, topic: **Edge Centrality in Hypergraphs (2015-2017)**
16. Rahul Goel, topic: **Competitive marketing strategies in Social Networks (2015-2017)**
17. Puspita Majumdar, topic: **Cross Domain Recommender System (2015-2017)**
18. Debayan Chakraborty (2014-2016), **Diffusion Dynamics in Complex Networks using Overlapping and Non-overlapping Community Structures.**
19. Prity Kumari (2014-2016), **Computation and Updation of Betweenness Centrality in Dynamic Network.**
20. Deepak Malik (2014-2016), **Link Prediction in Multiplex Network.**

21. Roshan Agarwal (2014-2016), **A Rule Based Improvement To Time Series Model Out- put For Short-Term Load Forecasting.**
22. Naveen Gupta (PDPM IITDM Jabalpur) (2013- 2015), **Influence and Evolutionary Dynamics on Social Networks** with joint supervision Dr. Atul Gupta (PDPM IITDM Jabalpur).

B.Tech. PROJECTS

Guided 35 plus UG projects.

PROFESSIONAL ACTIVITIES

EDITOR

1. Nonlinear dynamics Journal, Springer
2. "Smart cities challenges, technologies and trends." *Frontiers in big Data* 6 (2023)
3. Machine Learning and Artificial Intelligence for Smart Systems in Engineering and Healthcare – Select Proceedings of FLAME 2024, Springer

EXTERNAL REVIEWER

- Reviewed manuscript for China Communications journal.
- Reviewed manuscript for Journal of Communications and Networks.
- Reviewed manuscript for Journal of Internet Technology
- CARE 2013
- NCC 2014
- SITIS 2014
- SITIS 2015
- IEEE Communication Letters
- IEEE Transactions on Cybernetics
- Applied Network Science.
- EURASIP Journal on Image and Video Processing
- PLOS ONE
- Physica A: Statistical Mechanics and its Applications
- Complex Networks 2016
- IEEE Transaction on Network Science and Engineering

- IEEE Transaction on Communications
- IEEE Access
- Information Sciences
- Applied Network Science

PROFESSIONAL ACTIVITIES

- TPC member, CARE 2013, ICCCS 2015, NGCT 2015, ICCCA-2015, International Conference on Computational Techniques in Information and Communication Technology, ICCCC-2015, GLOBAL TIE Summit 2016, SITIS 2015, IACC-2016, ICACCA 2016., DASA
- Complex Networks 2016, CSONET 2017
- Advisory Committee member, RDCAPE 2015.
- Session Chair in CSoNet 2016, Ho-Chi Minh, Vietnam
- Session Chair in COMPLEX NETWORKS 2016, Milan, Italy
- Session Chair in International Conference on Future Learning Aspects of Mechanical Engineering 2020 (FLAME 2020).
- Session Chair in 12th International Conference CICN 2020 to be held on 25-26 Sep 2020 at BIAS Bhimtal.
- Session Chair in International Conference on Future Learning Aspects of Mechanical Engineering 2022 (FLAME 2022).
- Session chair in VIIC-2022 event of ANTIC-2022, BHU Varanasi, India on Dec. 23, 2022
- Session Chair in CSONet 2022 on Dec. 6, 2023
- Session Chair in 7th International Joint Conference on Computing Sciences (ICCS) on 5th May 2023.
- Session Chair in Third International Conference on Secure Cyber Computing and Communications (ICSCCC-2023). The conference will take place from 26th to 28th May 2023 at the Department of Computer Science & Engineering, Dr B R Ambedkar National Institute of Technology Jalandhar, Punjab, India.

PROFESSIONAL MEMBERSHIPS

- ACM (annual professional membership)

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- **IEEE Senior Member** (annual professional membership)
- IEEE Computer Society (annual professional membership)
- ICEIT (lifetime membership)
- ISTE (lifetime membership)
- Network Science Society

ADMINISTRATIVE RESPONSIBILITIES

Period	Organization	Designation	Nature of Responsibility
Aug. 12, 2022 to May 1, 2024	NIT Delhi	Dean R&C	Taking care of institute research and Consultancy activities and enhance it
July 15, 2021 to Aug. 12, 2022	NIT Delhi	Head, Computer Science and Engineering	Heading the department of Computer Science and Engineering
March 2018 to Jul 14, 2021	NIT Delhi	Head, Computer Center	Heading the Computer Center as Central Facility
Aug. 2018 to contd..	NIT Delhi	Chairman, House Allotment Committee, Guest House Committee	Chairing House allotment and guest house committees
Aug. 2018 to contd..	NIT Delhi	Estate Officer	All responsibilities related to Estate office
December 17, 2014 to March 2018	NIT Delhi	Head of the Department	Heading the CSE Department
December 17, 2014 to July 29, 2016	NIT Delhi	Dean (P&D) I/C	Planning the expansion and diversification of institutional activities
December 17, 2014 to July 29, 2016	NIT Delhi	Chairman, Institute website committee	Maintain and Update institute website
August 18, 2015 to July 29, 2016	NIT Delhi	Chairman, Institute Purchase committee	To recommend the cases of purchase
August 18, 2015 to July 29, 2016	NIT Delhi	Chairman, House Allotment Committee	Allotment quarters as per institute norms
August 18, 2015 to July 29, 2016.	NIT Delhi	Chairman, Classrooms Infrastructure &	Plan and procure hardware and software for e-

		Maintenance Committee	classrooms
Feb. 14, 2014 to July 29, 2016	PDPM IIITDM Jabalpur	Sports Counselor	Coordinate Sports Activities
Apr. 29, 2014.. Dec. 12, 2014	PDPM IIITDM Jabalpur	PGCS member from CSE	Academic committee for postgraduates
May. 15, 2014	PDPM IIITDM Jabalpur	LCS member from CSE	Library committee
6 months (4 times)	GGs IP University	Superintendent and additional superintendent	Central coding/ Decoding and evaluation of the B.Tech. answer sheets
1 year	AKG Engineering College, Ghaziabad	Warden	Take care of the Boys hostel

PERSONAL INFORMATION

Date of Birth: 25th March 1978

Father's Name: Dr. Dhruv Kumar Singh

Marital Status: Married.

Hobbies: Traveling, Listening Music, Stamps Collection.

Language Known: English, Hindi.