Dr. Poonam Agarwal

Dr. Poonam Agarwal,
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Present Occupation

28.08.2023-currently: Associate Professor in School of Computer and Systems Sciences, Jawaharlal Nehru University, New Delhi, India

04.09.2013-28.08.2023: Assistant Professor, School of Computer and Systems Sciences, Jawaharlal Nehru University, New Delhi, India

Research areas *:* Inernet of Things, Wireless Sensors,Triboelectric Energy harvester, Microsystems, RF MEMS, Microwave, Biosensor,

Academic Profile

Doctor of Philosophy: Ph.D
2011 March: Electrical Communication Engineering Department, Indian Institute of Science, Bangalore, Karnataka, India

Master of Technology: M.Tech Microelectronics,
2004: Panjab University, Chandigarh, India

Past Experience

- 2013 April-2013 September: DST INSPIRE Faculty at CEERI Pilani Rajasthan
- 2012 April-2013 April: Postdoctoral research fellow at *Nanyang Technological University, Singapore.*
- 2011 May-2012 March: MEMS Project Staff (Assistant Professor Grade), at MEMS Design Centre, Jaypee Institute of Information Technology, Noida, UP, India.
- 2004 June-2004 December: Project officer, CDAC Mohali, India,

Award/Honors

1. DST INSPIRE Faculty Awardee 2012 from Department of Science & Technology, Govt. of India
2. MHRD scholarship during PhD
3. GATE-2002 qualified; GATE scholarship during M.Tech

Publications

Book Chapters:

1. A Sharma, **P Agarwal,** "Triboelectric Based Kinetic Energy Harvesting Using Polydimethylsiloxane (PDMS)" book chapter in : From nat. to Nanomaterials: Advances in Polymer Sciences and Technology, Selected Papers from APA 2017, **Gupta**, B., **Ghosh**, A.K., **Suzuki**, A., **Rattan**, S. (Eds.) 978-981-13-2567-0, 459714_1_En, (8) https://www.springer.com/gp/book/9789811325670
2. **P Agarwal**, book Chapter: "MEMS Non-Silicon Fabrication Technologies", in Book, "Sensors and Biosensors, MEMS Technologies and its Applications", Book Series "Advances in Sensors: Reviews: Vol.2, Edited by Surgey Y .Yurish, IFSA Publisher, Pubdate: 15 April 2013 , ISBN: 978-84-616-4154-3, e-ISBN: 978-84-616-4153-6. http://www.sensorsportal.com/HTML/BOOKSTORE/Advance_in_Soensors_Vol_2.htm

Journal Publications:

3. Sushma Choudhary∗ and Poonam Agarwal, "Real-time label-free glucose measuring using ANN-enabled microwave sensor", Engineering Research Express, Volume 7, Number 4 Sushma Choudhary and Poonam Agarwal 2025 Eng. Res. Express DOI 10.1088/2631-8695/ae2b4e **IF 1.6**

4. Swati Todi, Shankul Patel, and Poonam Agarwal, Bi-functional Glucose Sensing-Transmission (Sens-Tra) Sensor for IoT-based Applications in *Ad Hoc Networks* Journal 2025 **IF 4.8**

5. Swati Todi and Poonam Agarwal, Sensitivity Enhancement by Introducing Altered Ground Conductors Around the Sensing Area of the Coplanar Meander-Interdigital Capacitor Structure Sensor in *Arabian Journal of Science and Engineering*. 2025 **IF 2.9**
6. S Todi, **P Agarwal**, "Sensitivity Analysis of Microstrip Patch Antenna Genres: Slotted and Through-hole Microstrip Patch Antenna," *Biomed Eng Lett* . 2024 Dec 18;15(1):249-260. doi: 10.1007/s13534-024-00443-7. DOI: 10.1007/s13534-024-00443-7 **IF 2.8**
7. Ansari, M.A., Agarwal, P. Inductance Modelling of Planar Meander Structure Using RBM and kNN. *SN Computer Science* **5**, 1169 springer (2024) . https://doi.org/10.1007/s42979-024-03516-7
8. Sharma, A., Agarwal, P. Experimental Study to Analyse the Effect of Force-Frequency Mutual Dependency on the Performance of Vertical Contact-Separation Triboelectric Energy Harvester. *J. Vib. Eng. Technol. Springer, August* (2023). https://doi.org/10.1007/s42417-023-01107-z **IF 2.4**
9. Priya Rai, **Poonam Agarwal**, Inset fed microstrip patch antenna for the glucose detection using label-free microwave sensing mechanism, Metrol. Meas. Syst., Vol. 30 (2023) No. 2, pp. 211–222, April 2023. DOI: 10.24425/mms.2023.144867 **IF 1**
10. Mohammad Ahmad Ansari, Krishnan Rajkumar, **Poonam Agarwal,** "To Predict the Characteristic Impedance of The Microstrip Transmission Line Using Supervised Machine Learning Regression Techniques," International Journal of Computer Applications in Technology, 2023. ESCI
11. S Todi, **P Agarwal**, "Mediator-Free and Rapid Glucose Sensing Using 5-Turn Meandered Signal Coplanar Sensor (MSCS) with Rectangular PDMS Cavity for the Sensitivity Enhancement, IETE Technical Review, 2022 (IF 2.5) SCIE

12. Sharma A, **Agarwal P.** Cost-effective test set-up for the real-time measurement of the triboelectric energy harvester. Journal of Vibration and Control, December 2021. https://doi.org/10.1177%2F10775463211056400 IF 2.4 SCIE
13. Swati Todi, **Poonam Agarwal,** "Non-destructive Test set-up for the Real-time Glucose Quantification using 5-turn Meandered Signal Coplanar Sensor integrated with Circular PDMS Cavity," IETE Technical Review, October. 2020, Taylor & Francis. https://doi.org/10.1080/02564602.2020.1825127 IF 2.5
14. A. Sharma**, P. Agarwal**, "Experimental Study of Resistive Load for Impedance Matching of Triboelectric Energy Harvester Fabricated with Patterned PDMS Polymer Layer", *SN Applied Sciences*, Vol. 2 , No. 6, 1058, 2020. https://doi.org/10.1007/s42452-020-2820-2 **IF 2.8**
15. A Sharma, **P Agarwal**, "Performance Enhancement of the Triboelectric Energy Harvester by forming Rough Surface Polymer Film Using Poly-Dimethyl-Siloxane (PDMS) +25wt% Water Solution", *International Journal of Digital Signals and Smart Systems*. Vol. 4, Nos. 1/2/3, 2020. (extended version of SEEM 2018)
16. A Sharma, **P Agarwal**, "Triboelectric Energy Harvester performance enhanced by modifying the tribo-layer with cost-effective fabrication," *Material Research Express* 16, 2019, ttps://doi.org/10.1088/2053-1591/ab0f64 IF 2.2
17. M Sameer, **P Agarwal**, "Coplanar Waveguide Microwave Sensor for Label-free Real-time Glucose Detection," *Radioengineering*, vol. 28, no. 2, December 2018. 10.13164/re.2019.0491 IF 1.043
18. Md Zainul A. **P Agarwal**, "Microwave Sensing Technique based Label-Free and Real-Time Planar Glucose Analyzer Fabricated on FR4 Real-time Planar Glucose analyzer," *Sensors and Actuators A:Physical*, 279, 132-139, 2018. https://doi.org/10.1016/j.sna.2018.06.011 **IF 4.9**
19. **Poonam Goel,** "Review: MEMS non-Silicon Fabrication Technologies," *International Journal of Sensors & Transducers*, vol. 139, no. 4, pp. 1-23, April 2012.
20. **Poonam Goel,** Anthonisamy C, "Development of MEMS varactor on microwave laminate board for RF applications," *International Journal of Sensors & Transducers*, vol. 139, no. 4, pp. 162-173, April 2012.
21. **Poonam Goel,** K. J. Vinoy, "A low cost approach for the fabrication of microwave phase shifter on laminates," *Journal of Microsystem Technol, Springer*, vol 17, no 10, pp. 1653-1660, *2011, DOI:* https://doi.org/10.1007/s00542-011-1342-7 **IF 1.82**
22. **Poonam Goel,** K. J. Vinoy, "A low-cost phased array antenna integrated with phase shifters co-fabricated on the laminate," *Progress in Electromagnetic Research* PIERB, 30, page 255-277, 2011. 10.2528/PIERB11041105

Invited Talks:

23. **Poonam Agarwal**, "Triboelectric: Energy harvester to self-powered sensor", 5th National Conference on Multifunctional Advanced Materials (MAM-2024) held on 7-9 August, 2024 at Amity University Haryana.
24. **Poonam Agarwal,** "Internet of Things", Lecture in "Capacity Building Program for KRPs in Single Major Subject Pattern in Computer Applications" March 06, 2024 held at UGC-MMTTC, JNU
25. **P Agarwal, "**Microsystems lab activities" invited talk, in One Day Workshop on MEMS, NEMS and Microfluidics Location: IRD Conference Room, 7th Floor, Main Building, IIT Delhi Date: 25.02.2023.

26. **P Agarwal**, Glucose Sensor Using Microwave Sensing Technique, Invited Plenary talk in Smart Materials and Nanotechnology, 4-6 October 2018 at Amsterdam.

27. ***Poonam Goel****,"Technological Advancements: Micro/Nano Technologies"* on 11th August 2014 in 17th Refresher Course in Computer Science and Information Technology, organized Academic Staff College (ASC), held a*t JNU New Delhi, India.*

International/National/Symposium/Conferences:

28. Sushma Choudhary, **Poonam Agarwal**, "Machine Learning-Enabled Glucose Sensing Using Concentric Dual-Ring Microwave Sensor, " International Conference on Machine Learning and Data Engineering (ICMLDE 2025) held at Ramada Hotel, Dehradun, India on November 06-08, 2025.
29. Swati Todi and **Poonam Agarwal**, Experimental Study to Investigate the Impact of Sensing Area and Sample Volume on Sensitivity of Circular Interdigital Capacitor-based Analyzer in ICOM Conference, IIT Guwahati 2025.
30. Sushma Choudhary, **Poonam Agarwal**, "CPW-Fed Concentric Dual-Ring Antenna for Real-time Label-free Glucose Sensing" "6th International Conference on Emerging Technologies: Micro to Nano (ETMN-2024)," hosted on 22-23 November 2024 at Jamia Millia Islamia University, New Delhi, India.
31. Mohammad Ahmad Ansari, **Poonam Agarwal,**'Inductance Modelling of Planar Meander Structure using RBM and kNN accepted 4th International Conference on Computing, Analytics, and Networks (ICAN 2024) to be held at Chitkara University, Punjab, India, on September 24-25, 2024. (Extended paper in SN computer Science)
32. Sushma Choudhary, **Poonam Agarwal**, "Flexible CPW-Fed Circular Ring Antenna on Multilayer PDMS+ULTRALAM 3850HT Substrate for the Wearable Sensing Applications." *IEEE 7th International conference on Computer applications in Electrical Engineering-Recent Advances, IIT Roorkee, October 27-29,2023.*
33. Mohammad Ahmad Ansari, **Poonam Agarwal**, "Inductance Prediction Model for the Planar Meander Structure Using RBF," *IEEE Microwaves, Antennas And Propagation Conference (MAPCON) - 2023*, Convention Centre of Wyndham Hotel at Ahmedabad, India, December 10-14, 2023.
34. Swati Todi, **Poonam Agarwal**, "Label-free Glucose Monitoring using Meandered Signal Coplanar Sensor (MSCS) loaded with Inter-digitated Conductor Bricks,"2nd International Conference on Advances In Materials Science, Communication and Microelectronics 17-18 June 2022, JECRC foundation held at Jaipur. Published Materials today proceeding.
35. Swati Todi, **Poonam Agarwal,** "LC resonator embedded in the CPW transmission line for the glucose sensing in aqueous solution," ***IEEE*** *8th International Conference on Signal Processing and Integrated Networks (SPIN 2021),* Amity University, Noida, August 26-27, 2021
36. Hemraj Kumawat, **Poonam Agarwal,** Artificial Neural Network Model to Predict the Design Parameters of Inset-fed Microstrip Patch Antenna, ***IEEE*** *8th International Conference on Signal Processing and Integrated Networks (SPIN 2021),* Amity University, Noida, August 26-27, 2021
37. Manish Jha, **Poonam Agarwal**, "Design of Dual-Band Bandpass Filter on Coplanar Waveguide Using Meander Inductor," *International conference on Electronics and Sustainable Communication Systems (ICESCS 2020), IEEE*, 28-30 April, 2020, Hindusthan Institute of Technology, Coimbatore, Tamil Nadu, India.

38. Mohammad Ahmad Ansari, **Poonam Agarwal** and Krishnan Rajkumar, "Artificial Neural Network (ANN) to Design Microstrip Transmission Line," *International Conference on Artificial Intelligence and Applications (*ICAIA 2020*), February 6-7,2020 New Delhi.*

39. Swati Todi, **Poonam Agarwal,** "Meandered Signal Coplanar Sensor (MSCS)," 7th *International Conference on Signal Processing and Integrated Networks (SPIN 2020)*, Amity University, Noida, February 27-28, 2020

40. A Sharma, **P Agarwal**, "Triboelectric Energy Harvester with Patterned PDMS Polymer Layer," *International Meeting on Advanced Technologies in Energy and Electrical Engineering (IMAT3E)*, Tunis, Tunisia, November 28-29, 2019.

41. M. Kohali, A Sharma, **P Agarwal**, Vibrational Electromagnetic Energy Harvester Implementation using Wire Wound Single Layer Planar Coil," *International conference for advanced materials, Energy and environmental Sustainability, ICAMEES,* 14-15 December 2018, University of Petroleum & Energy Studies, Dehradun, India

42. A Sharma, **P Agarwal**, "Impact of Rough Surface Morphology of Diluted Poly-DiMethyl-Siloxane (PDMS) Polymer Film on Triboelectric Energy Harvester Performance," *IEEE* International Conference on "*Sustainable Energy, Electronics & coMputing Systems (SEEMS-2018)*", 26-27 October 2018 at ITS Engineering College, Greater Noida, U.P.

43. A Sharma, **P Agarwal,** "Triboelectric Based Kinetic Energy Harvesting Using Polydimethylsiloxane (PDMS)," International Conference *Advances in Polymer Science & Technology*, 23-25 November 2017 organized by IIT Delhi, India

44. **Poonam Goel**, A. B. Bhattacharyya, "DC inductance modeling of coplanar meander inductor with grounded guard ring," *International conference 2012*, 4-7 January 2012, at Indian Institute of Science, Bangalore, India, NPMASS organizer.

45. **Poonam Goel**, K. J. Vinoy, "A low cost fabrication approach for electrostatically actuated phase shifter on printed circuit board for phased array antenna," National conference on challenges in Micro/Nano Electronics, SIT Tumkur, India, March 26-27, 2010.

46. **Poonam Goel,** K. J. Vinoy, "An electrostatically actuated phase shifter on PCB and its demonstration in phased array antenna," in-house Electrical Engineering Divisional symposium, at IISc Bangalore, India, 23-24 January 2010.

47. **Poonam Goel,** K. J. Vinoy, "An electrostatically actuated phase shifter on printed circuit board for a low cost phased array antenna," National Conference on MEMS, Smart Structures and Materials, at Central Glass and Ceramic Research Institute, Kolkata, India, October 14-16, ISSS-2009.

Research Grant:

- DST INPSIRE Faculty award research grant PI
- UGC-UPE II intra university PI

My Research Group:

	Ongoing	Completed
Postdoc	01	01
PhD	05	02
MTech/MPhil		09
MCA		08
BTech		07

New/Revised Courses:

- Digital System Design
- Embedded Systems
- Microfabrication technologies
- MEMS Technology

Courses Taught

School of Computer & Systems Sciences

- Digital System Design CS-101
- Computer Architecture CS-106
- VLSI Technology CS-726
- MEMS Technology CS-781
- Wireless Sensor Network CS-770
- Wireless Sensor Network((CS-838))
- Computer Fundamentals
- Wireless Networks (CS-446)
- Internet of Things (CS-932)
- Programming in C (CS-401)

School of Engineering

- Digital electronics lab
- *Microprocessor (Aug-Dec 2020) BTech*
- PCB fabrication lab

Course developmemt

- IGNOU:MCS202: instruction set architecture Unit 9, unit-3 instruction set for PG level students. September 2021 IGNOU computer architecture two modules

  https://egyankosh.ac.in/handle/123456789/72494/simple-search?query=&sort_by=score&order=desc&rpp=10&filter_field_1=dateIssued&filter_type_1=equals&filter_value_1=2021&etal=0&filtername=author&filterquery=Agarwal%2C+Poonam&filtertype=equals