

Curriculum Vitae

Dr. Shivani Nain

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Career Objective:

To obtain a position as a patent attorney where I can build a career and utilize my interdisciplinary background in electronics, biomedical and analytical instrumentation, sensors and intellectual property.

Academic Background:

Pursuing WISE-Internship in IPR (DST-TIFAC) at KAN AND KRISHME, Attorneys at Law, Paschim Vihar, Delhi	January 2024 onwards
Ph.D. (MEMS-Nanorobotics) Birla Institute of Technology and Science, Pilani Rajasthan, India Thesis Title: <i>“Design, Simulation and Experimental Investigations on Scaled Up Branched Flagellated Artificial Nanoswimmer”</i> Supervisor: Dr. Jitendra Singh Rathore (Associate Professor) Co-Supervisor: Prof. (Dr.) Niti Nipun Sharma (Vice Chancellor Manipal University, Jaipur, India)	Awarded, September 2020
Master of Science (M.Sc.)-Bioelectronics and Instrumentation with 81.7%- Jamia Hamdard University, New Delhi	2010-2012
Bachelor of Applied Sciences (B.A.Sc.) Honours Instrumentation with 74.94%- Shaheed Rajguru College of Applied Sciences for Women, University of Delhi, Delhi	2007-2010
UGC NET-JRF (Electronics Science)	June, 2014

Other Qualifications:

- DL-101 General Course on Intellectual Property, WIPO Academy
- DL101PCT Distance Learning Course: Introduction to the Patent Cooperation Treaty,

WIPO Academy

- DL-320 Basics of Patent Drafting (Self-study) e-Tutorial on Using Patent Information, WIPO Academy

Professional Carrier:

- Filing and Drafting Forms (F-1, F-2, F-3, F-5 and F-26) of Patent Application in India, Initial Reporting to Client, Drafting response of **First Examination Report** with Attorney, Drafting and filing Amendments (Form-13) as per client's instructions.
- **Guest Faculty** University of Delhi (**5th Jan 2023 – 10th May 2023**)
- **Teaching Assistant (Aug 2013 - Dec 2019)**- Assisted in the following practical laboratory courses at BITS Pilani at undergraduate level.
 - Digital Electronics Lab, Microprocessor Tutorials, Workshop Practice, Electrical Lab
 - Mini Projects of micro-electro-mechanical system (MEMS) Lab, Trained 8 Undergraduate and Graduate students to complete their thesis project.
- **Research Assistant (Aug 2012 - Jun 2014)** in University Grant Commission (UGC) sponsored Project Title: "Design and Development of Test Rig to Understand Dynamics of Nanorobots" (F. No.41-990/2012 (SR)) under the supervision of Principal Investigator: Prof. Niti Nipun Sharma and Co-Principal Investigator: Dr. Jitendra Singh Rathore at BITS Pilani, Rajasthan, India.
- Reviewer of IEEE Nanotechnology Journal, Journal of Mechanical Science and Technology and Nano Express Journal.

Awards and Fellowships:

- **Fellowship WISE-Internship in IPR (Formerly DST Women Scientist-C)** (Jan 2024 onwards).
- **UGC NET-JRF** (Junior Research Fellowship) (Mar 2015 - December 2019).
- **Junior Research Fellowship** at BITS Pilani, India (Aug 2014 - Feb 2015).
- Attained **First rank** in B.A.Sc. (H) Instrumentation 1st year Delhi University in 2008.
- Attained **Second rank** in M.Sc. Bioelectronics and Instrumentation, Jamia Hamdard University, Delhi in 2012.
- Awarded **Best Poster Presentation** in UGC National Conference on "Bioelectronics and Biomedical Technology" held on 29th-30th Jan 2013 organized by Jamia Hamdard University, New Delhi.

Internships and Workshops:

- Participated in 2 days workshop (Mar 25th-26th 2019) on “**Analytical Instruments for Chemical and Environmental Engineering**” organized by IChE Pilani Regional Centre & Dept. of Chemical Engineering held at BITS Pilani.
- Participated in 3 days (May 27-29, 2015) **INUP Familiarization Workshop on Nanofabrication Technologies**, held at IIT Bombay.
- Participated in 2 days workshop on Microfluidics HD and presented the poster entitled “**Simulation, Design and Comparison of Y and L Shape Viscometer for Diagnostic Applications**”, organized by CSIR-CEERI Pilani & Queen Mary University of London, 2015.
- 6 months internship at CSIR- Central Electronics Engineering Research Institute (CSIR-CEERI) in MEMS and Micro Sensors Group on “**Design and Fabrication of Microfluidic Chip for Viscosity Analysis**” (05th Jan 2012 - 29th Jun 2012).
- Participated in 2 days workshop (Jan 21-22, 2010) on “**Role of Analytical Techniques in Industry**” organized by Kirori Mal College, University of Delhi.
- Summer Training at **National Institute of Communicable Disease (NICD), Delhi** (22nd May 2009 - 29th Jun 2009) on Zoonotic diseases.

Practical Knowledge and Software Skills:

- Excellent Knowledge of COMSOL Multiphysics software, Mendeley, Origin software, C language and MS-Office.
- Good knowledge of Digital and Analog practical, Step Up-Step Down Transformer, Linear Variable Displacement Transducer, Semiconductors, Viscometer, Laser micrometer, Gas chromatography, HPLC, UV-VISIBLE Spectrophotometer, Flame photometer, Infrared instrument, EEG and ECG.

Area of Interest:

Researcher with strong interdisciplinary background having keen interest in the following research areas:

- Microelectromechanical system (MEMS), Biosensors and Microfluidics
- Nanorobotics, Piezoelectric Energy Harvesting and Electronics
- Biomedical Instruments and Analytical Instruments

List of Publications in Reputed International Journals:

1. **Shivani Nain** and N N Sharma. "Propulsion of an artificial nanoswimmer: a comprehensive review." *Frontiers in Life Science*, Taylor and Francis, 8, no. 1 (2015): 2-17.

2. **Shivani Nain**, J S Rathore, N N Sharma. "Comparison of Piezo-material based Energy Transduction Systems for Artificial Nanoswimmer". Materials Science and Engineering, vol. 346, no. 1 (2018): 2-9.
3. N N Sharma, **Shivani Nain**, J S Rathore. "Enhanced and self-tuned motive force for locomotion of a nanorobot: Possible solution from nature". American Journal of Advanced Drug Delivery, vol. 07, (2019): 25-26.
4. **Shivani Nain**, J S Rathore, N N Sharma. "Experimental Investigation of Biomimetic Propulsion through a Scaled Up Branched Flagellated Artificial Nanoswimmer". Australian Journal of Mechanical Engineering, vol.18,(2020):1-10.
5. Dharmender Singh, Shubham Sharma, Rahul Kumar Thakur, Vaishali, **Shivani Nain**, Jyoti, Chandi C. Malakar, Virender Singh. "Cu-catalysed diversity-oriented synthesis of isoxazole and imidazo[1,2-a]azine conjugates". Tetrahedron (Elsevier), vol. 152, (2024): 133809.
6. **Shivani Nain**, J S Rathore and N N Sharma. "Enhanced Locomotion of Branched Flagellated Nanoswimmer: Design, Simulation and Experimental Investigation". (Manuscript submitted).

Book Chapter:

1. **Shivani Nain**, J S Rathore, N N Sharma. "Nanoswimmer Energy Transduction System: Influence of Branching. In Engineering Vibration, Communication and Information Processing, pp. 515-522. Springer, Singapore, 2019.

Paper Presented in National/International Conferences:

1. **Shivani Nain**, P Puri, S Javed, R Prajesh and A Agarwal. "I-shape Micro-Viscometer: Design and Simulation", UGC Sponsored National Conference on Bioelectronics and Biomedical Technology Jamia Hamdard University, New Delhi 2013.
2. **Shivani Nain**, J S Rathore and N N Sharma. "Effect of Secondary Branching on Piezo based Powering Mechanism to Actuate Artificial Nanoswimmer", ISSS Conference, (4-7 Jul 2017), IISC Bangalore.
3. V Paul, **Shivani Nain**, J S Rathore, N N Sharma. "Experimental Study on Helical Propulsion System of Artificial Nanoswimmer", IEEE Nano Conference Pittsburgh USA, 25-28 Jul 2017, The conference proceedings published by IEEE explore, are indexed by Scopus and EI.
4. **Shivani Nain**, J S Rathore, N N Sharma. "Harness enough energy for locomotion of an artificial nanoswimmer: Design and simulation", ETMN 2017 (6-7 Oct 2017)), Conference proceedings published by AIP, are indexed by Scopus.

References:

1. Dr. Jitendra Singh Rathore, (Ph.D. Supervisor)
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2. Prof (Dr.) Saleem Javed (Chairman)
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3. Dr. Rahul Prajesh, Senior Scientist
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DECLARATION:

I hereby declare that the above-mentioned information is correct up to my knowledge.

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