



Dr. Manisha V Makwana



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ABOUT ME



Ph.D. in nanotechnology, having experience in the simulation and atomistic finite element analysis. Expertise in nano biosensors simulation for various type of biological objects. Additionally, knowledge in designing and modelling of setup, design of experiments and statistics for graphene-based composite for space application. An enthusiastic, adaptive, and expeditious person with a broad and acute interest in the area of nano science and nano technology. Currently serving as an Assistant Professor, with a passion for high-impact research, interdisciplinary collaboration, and mentoring in the fields of nano mechanics and nano-engineered systems.

Professional Preparation



Doctor of Philosophy, Mechanical Engineering

(CVM University, Vallabh Vidyanagar, Gujarat, India)

July 2024

Master of Engineering, Machine Design

(Sardar Patel University, Vallabh Vidyanagar, Gujarat, India)

June 2004

Bachelor of Engineering, Mechanical Engineering

(Gujarat University, Ahmedabad, Gujarat, India)

June 2001

Professional Experience



June 2013 to Continue

Assistant Professor

A D Patel Institute of Technology, New Vallabh Vidyanagar, Anand, Gujarat, India

July 2009 – June 30, 2013

Assistant Professor

M B Patel Institute of Technology, New Vallabh Vidyanagar, Anand, Gujarat, India

2007 to June 30, 2009

Assistant Professor

A D Patel Institute of Technology, New Vallabh Vidyanagar, Anand, Gujarat, India January

June 2006 – January 2007

Ad hoc Lecturer

A D Patel Institute of Technology, New Vallabh Vidyanagar, Anand,

Gujarat, India

Projects



Ph.D. Thesis Project

Title: Atomistic Modeling and Molecular Dynamic Analysis of Graphene for Nano Sensors

Duration: January 2021 to May 2024 (Part time scholar)

- My work broadly falls in nanomaterials simulation for nano sensors. Research work mainly focused on mass sensors and biological objects sensors.

Patents



	Name of Inventors	Title	Applicati onNo	Awardin g Agency	Date of award/filling	Status
1	Manisha Makwana Dr. Ankit Dilipkumar Oza, Dr. Parwathi Pillai, Komal Gunvantbhai Desai, Rutu Rajivkumar Joshi, Dr. Prexa H Parikh, Dr. Anjali Mishra ,Nibedita Pani, Swati Prajapati,	“Sustainable Water Purification System Portable Device With Tds Measuring Display And Controller	368979-001	Indian Patent, Intellectual Property Right, Govt of India (Design Patent)	09-08-2022	Granted & Published
2	Ms. Manisha Makwana, Dr. Ankit Dilipkumar Oza, Dr. Gaurang Rajendra prasad Joshi, Mr. Raghavendra Somabhai Darji, Dr. Sabana Azim, Ms. Sweetyben Shaileshbhai Patel, Mr. Rajnikant Bidajwala, Mr. Guarav Kumar Pandey, Mr. Ramendra Singh Niranjn, Dr. Sachin Manohar Shinde, Dr. Jaivindra Singh, Mr. Sunil Kumar Yadav, Mr. Ranit Karmakar	Die Sinking Electro discharge Machine	366788-001	Indian Patent, Intellectual Property Right, Govt of India (Design Patent)	25-06-2022	Granted & Published)
3	Mrs. Manisha Makwana, Dr. Ankit Dilipkumar Oza, Dr. Ashish Kumar Shukla, Dr. Kiran Suresh Bhole, Dr. Sachin Manohar Shinde, Mr. Gaurav Kumar Pandey, Mr. Ramendra Singh Niranjn, Dr. Utsav Dipak Gadhia, Mr. Ishwer Shivakoti, Dr. Shubhangi Liladhar Vaikole, Ms. Maitriben Harshadbhai Dave, Dr. Ajaykumar Mahendrabhai Patel, Mr. Ranit Karmakar, Mrs. Srushti Bhatt	A System For Developing A Novel 3d Printed Bionic Prosthetic Leg	202022103 187.8	German Utility Patent	04-06-2022	Granted & Published



- 1) **Makwana, M.V.** Advanced biosensing of human papilloma virus using bilayer graphene. **Graphene and 2D mater Springer Nature (2025).** <https://doi.org/10.1007/s41127-025-00092-2>. (ESCI- SCOPUS)
- 2) **Makwana, M.** FEM simulation of SARS-CoV-2 sensing in single-layer graphene-based bionanosensors. **J Mol Model 30, 327 (2024) Springer Nature.** <https://doi.org/10.1007/>. (SCIE, Q2, IF 2.4)
- 3) **Makwana, Manisha., Patel, A.M.** Bionanosensor utilizing single-layer graphene for the detection of iridovirus. **J Mol Model 30, 256 Springer Nature (2024).** (SCIE, Q2, IF 2.37) DOI: <https://doi.org/10.1007/s00894-024-06035-7>
- 4) **Manisha Makwana, Ajay M Patel,** “Nano Resonator Vibrational Behaviour Analysis of Single- and Double-Layer Graphene with Atomic vacancy and Pinhole Defects” **Journal of Molecular Modeling, Springer Nature,2023.** (SCIE, Q2, IF 2.37)
- 5) **Manisha Makwana, Ajay M Patel, Ankit D. Oza, Manoj Kumar, Abhishek Kumar, Abhishek Joshi,** “Influence on Dynamic Behaviour of Single Layer Graphene by Stone Wales and Pinhole Defects” **Advances in Materials and Processing Technologies, Taylor & Francis, 2023,** (ESCI, Q2, IF 2.37)
- 6) **Manisha Makwana, Ajay M. Patel , Ankit D. Oza, Chander Prakash, Lovi Raj Gupta, Nikolai Ivanovich Vatin and Saurav Dixit,** “The Effect of Mass on the Dynamic Characteristics of Single and Double Layered Graphene based Nano Resonators” **Materials, MDPI, 2022 (SCIE, Q1, IF 3.748)**
DOI: <https://doi.org/10.3390/ma15165551>
- 7) **Makwana, M. V., & Patel, A. M. (2023).** Molecular dynamic analysis of pristine single layered graphene for mass sensor. **Materials Today: Proceedings, 72, 729-735.** (SCOPUS Elsevier Q2 IF-2.46) 2022.
DOI:<https://doi.org/10.1016/j.matpr.2022.08.496>
- 8) **Makwana, M. V., & Patel, A. M. (2022).** Recent Applications and Synthesis Techniques of Graphene. **Micro and Nanosystems, 14(4), 287-303.** (SCOPUS: Q2 IF 0.253)
DOI:<https://doi.org/10.2174/1876402914666220318111303>
- 9) **Makwana, M. V., & Patel, A. M. (2022).** Multiwall Carbon Nanotubes: A Review on Synthesis and Applications. **Nanoscience & Nanotechnology-Asia, 12(3), 3-15.** (SCOPUS: IF 0.75)
DOI:<https://doi.org/10.2174/2210681211666211013112929>
- 10) **Usha Pawar, Kiran Bhole, Mansing Rathod, Ankit D. Oza, Dipali Bhole, Manisha Makwana,** “Design Optimization of Circular Vessel using Computational Fluid Dynamics for the Effective Heat Storage” **International Journal on Interactive Design and Manufacturing (IJIDeM), Springer 2022 (ESCI, Q2, IF--)**
DOI: <https://doi.org/10.1007/s12008-022-01177-5>
- 11) **Priyank Kansara; Apurva Indrodia; Mohit Diwan; Jaimin Raval; Navneet Yadav; Ankit D. Oza; Manoj Kumar; Sachin Shinde; Anjum Parvez; Manisha Makwana,** “Optimization of Gate Valve Structure based on Strength Parameters Using Finite Element Analysis”, **International Journal on Interactive Design and Manufacturing (IJIDeM), Springer, 2022 (ESCI, Q2, IF--)**
DOI: <https://doi.org/10.1007/s12008-022-01052-3>

- 12) Rahul Vaishya, Vivek Sharma, Anurag Gupta, Japneet Pathania, Ankit Oza, Anil Kumar Dixit, Kiran S. Bhole, **Manisha Makwana**, Amisha Patel, "Finite Element Modeling of Quartz Material for Analyzing Material Removal Rate in ECDM Process" International Journal on Interactive Design and Manufacturing (**IJIDeM**), **Springer, 2022 (ESCI, Q2, IF--)**
DOI: <https://doi.org/10.1007/s12008-022-01037-2>
- 13) **Manisha Makwana**, Ajay M.Patel, "Identification of Microbes Using Single Layer Graphene based nano Biosensors", Submitted **Journal of Molecular Modelling, Springer nature, 2023. (SCIE, Q2, IF - 2.43)**
- 14) **Makwana Manisha**; Ajay Patel; Ankit Oza; Ashish Goyal (2024) "Influence of stone wales and divacancy defects on the dynamic behaviour of single layer graphene" AIP Conf. Proc. 21 March 2024; 2985 (1): 020013. **SCOPUS, Q4 Impact Factor: (0.41).**
DOI: <https://doi.org/10.1063/5.0204476>.

Book Chapters:

- 1) **Manisha Makwana**, "The Effect of Artificial Intelligence on Human Creativity: From Competition to Collaboration" in Book Title: Artificial Neural Network for STEM innovation-theory, application, and parameter prediction ISBN Number: 9789363916920 Publisher: The CVM University in collaboration with Variety Books Publishers Distributors.
- 2) **Manisha Makwana**, "The Transformative Role of Nanomaterials in Shaping Futuristic Mechanical Systems" book "Futuristic Trends in Mechanical Engineering". The CVM University in collaboration with Variety Books Publishers Distributors.
- 3) **Manisha Makwana**, "Mass Sensing of Monolayer Graphene Comprising Miscellaneous Structural Defects" in book of 3rd International Conference on Advances in Manufacturing, Thermal and Design Engineering Department of Mechanical Engineering, National Institute of Technology Hamirpur, Himachal Pradesh, India

Conference

- 1) **Makwana Manisha**, "Adenovirus Detection Using Defect-Engineered Double-Layer Graphene" 2nd International Conference on Innovative Engineering Design (ICoIED-2026) at IIT Roorkee Design Organized by Innovation Centers (DICs) of NIT Uttarakhand and IIT Roorkee on 16th – 17th February 2026.
- 2) **Makwana Manisha**, "Adenovirus Detection Using Defect-Engineered Double-Layer Graphene" 2nd International Conference on Innovative Engineering Design (ICoIED-2026) at IIT Roorkee Design Organized by Innovation Centers (DICs) of NIT Uttarakhand and IIT Roorkee on 16th – 17th February 2026.
- 3) **Makwana Manisha**, "Multiple Defect Analysis of Double Layer Graphene" ICRADM-2026 2nd International Conference on Recent Advancements in Design and Manufacturing January 09–10, 2026. Organized by Department of Mechanical Engineering Sardar Vallabhbhai National Institute of Technology Surat - 395007, Gujarat, INDIA.
- 4) **Makwana Manisha**, "Mass Sensing of Monolayer Graphene Comprising Miscellaneous Structural Defects" 3rd International Conference On "Advances in Manufacturing, Thermal and Design Engineering (MATHED 2025)" 26th December - 28th December 2025 Organized by Department of Mechanical Engineering National Institute of Technology Hamirpur, Himachal Pradesh, India

- 5) **Makwana Manisha**, “Graphene-Based Resonators with Multiple Defects for Tymovirus Mass Detection” International Conference on Advanced Materials for Sustainable Development and Technology (AMSDT-2025) AMSDT00043 (November 07-08, 2025) Jointly Organized by Department of Physics Dr. B.R. Ambedkar National Institute of Technology Jalandhar, Punjab, India. (Scopus).
- 6) **Makwana Manisha**, Patel Ajay M, Oza Ankit D, Ashish Goyal, International Conference on Industry 4.0 - Nascent Technologies and Sustainability for 'Make in India' Initiative (SPICON 2022)” on 22-23 December 2022, Organized by Department of Mechanical Engineering, Sardar Patel College of Engineering, Mumbai, India Paper title: “Influence of Stone Wales and divacancy Defects on the Dynamic Behavior of Single Layer Graphene” (Scopus: **AIP Proceedings**)
- 7) **Makwana Manisha, Patel Ajay M** “1ST International Conference on Recent Advances in Mechanical Engineering (ICRAM 2022)” on 25-27 August 2022, Organized by Department of Mechanical Engineering, **IIT-Jodhpur** Rajasthan, India. Paper title: “Influence on Dynamic Behaviour of Single Layer Graphene by Stone Wales and Atomic Vacancy Defects.” (Scopus **book chapter**)
- 8) Ankit D. Oza, Manoj Kumar, Mit C. Patel, B. Suresh Kumar, Ashish Goyal, **Manisha Makwana**, International Conference on Industry 4.0 - Nascent Technologies and Sustainability for 'Make in India' Initiative (SPICON 2022)” on 22-23 December 2022, Organized by Department of Mechanical Engineering, Sardar Patel College of Engineering, Mumbai, India Paper title: “Machining Through Electric Discharge Machining (EDM) Process: A Mini Review” (Scopus: **AIP Proceedings**)
- 9) Ashish Goyal, Nipun Gautam, **Ankit D. Oza**, Amarish Badgujar and **Manisha Makwana**, “Future Learning Aspects of Mechanical Engineering is an international Peer-reviewed academic conference (FLAME 2022) “, on 3-5 August, 2022, Organized by Department of Mechanical Engineering, Amity University, Noida, U.P., India. Paper title: “Study of various optimization techniques by Laser beam and Abrasive jet machining processes” (**Materials Today Proceedings, (Elsevier)**)

During Professional Career

- 10) Chhazed, A. J., **Makwana, M. V.**, & Chavda, N. K. (2019). Microbial fuel cell functioning, developments, and applications-a review. *Int J Sci Res*, 8(12), 3620-3633. (**UGC Approved journal**)
- 11) **Makwana, M. V.**, & Shah, A. (2014). Design and manufacture of movable headlight system in automobile. *International Journal of Innovative and Emerging Research in Engineering*, 1(2), 12-16. (**UGC Approved journal**)
- 12) Chhazed, Abhishek J. **Makwana, M. V** et al. “Utilization of PET Waste in Plastic Bricks, Flexible Pavement & as Alternative Constructional Material-A review.” (2019). *International Journal of Applied Engineering Research*, vol 14-3, ISSN 616-620 (**UGC Approved journal**)
- 13) **Makwana Manisha**, Ravi Rathod “Hydraulically Controlled Tracking System for Solar Panel tional Material-A review.” (2019). *International Journal for Research in Engineering Application & Management (IJREAM)*ISSN : 2454-9150 Vol-06, Issue-05, Aug 2020(**UGC Approved journal**)

- 14) Jvalant Trivedi, Shradhdha Trivedi, Ravi Rathod, **Manisha Makwana**, Tejas Prajapati, "Vertical Axis Wind Turbines: A Review of the state-of-the art" Compliance Engineering Journal, ISSN NO: 0898-3577(**UGC Approved journal**)

Conference

- 15) **Makwana Manisha**, Mehul B Patel "Value analysis of double girder EOT crane" Second International Conference on Research and Innovations in Science, Engineering & Technology ICRASET-2020.
- 16) **Makwana Manisha**, Mehul B Patel, "Analysis of run out problem on agitator assembly of glass lined reactor". 2nd International Conference on "Women in Science & Technology: June 28-30, 2018 Creating Sustainable Career" June 28-30, 2018 organized by Birla Vishvakarma Mahavidyalaya (An Autonomous Institution).
- 17) **Makwana Manisha**, Mehul B Patel, "Design and development of strain gauge Dynamometer." 2nd International Conference on "Women in Science & Technology: Creating Sustainable Career" June 28-30, 2018 organized by Birla Vishvakarma Mahavidyalaya (An Autonomous Institution).

Professional Services



- 1) Invited Reviewer of Sardar Patel International Conference (SPICON-2022), Date: 22-23 December 2022.
- 2) A reviewer of Taylor and Francis journal, Journal on Interactive Design and Manufacturing (IJIDeM), Springer, MDPI and Bentham Science.

Expert Lecture



- 1) An expert talk on "**Importance of Indian Ethos and Values in Modern Life style**" delivered at AICTE - ATAL FDP program on "Green Technology - Innovations & Challenges" during 12th to 23rd DEC 2022 at A D Patel Institute of Technology.
- 2) An expert talk on "**Entrepreneurship Skill, attitude and behavior development**" delivered at G H Patel College of Engineering and Technology organized by Mechatronics Department on 26th February 2024.
- 3) delivered an expert lecture on the topic of "**Startup and Entrepreneurship in Current era**" on date **26/10/2023 at Electrical Engineering Department RCTI, Soal, Ahmedabad.**
- 4) An expert talk on "**New Avenue of Entrepreneurship**" was delivered at Institute of Advanced Research, The University of Innovation Gandhinagar on 06/10/2022.
- 5) An expert talk on "**Entrepreneurship in current area**" was conducted at R. C. Technical Institute Sola Ahmedabad on 19/01/2022.
- 6) An expert talk on "**Entrepreneurship Development**" was conducted Kilachand Devchand Polytechnic, Patan on 22/02/2022.
- 7) An expert talk on "**Entrepreneurship scope in current Scenario**" was

conducted at GMB Polytechnic Rajula on 25/02/2022.

- 8) An expert talk on “**basics of Entrepreneurship**” was conducted at B & B Polytechnique Institute Vidyanagar on 15/07/2022.
- 9) An expert talk on “**Women rights in India**” was conducted at M B Institute Tehnology on 09/04/2022.
- 10) An expert talk on “Entrepreneurship scope in current Scenario” was conducted at LE College of Diploma, Morbi on 13/09/2021.

Event Organize



- 1) Organized one day workshop on “**Entrepreneurship in current Era**” under the Entrepreneurship development cell, on 7th May 2022 at A D Patel Institute of Technology, New V V Nagar, Anand.
- 2) Organized international webinar on “**Enhancing Eloquence**” under the Entrepreneurship development cell, on 15th May 2021 at A D Patel Institute of Technology, New V V Nagar, Anand.
- 3) Organized seminar on “**Vedas in Rocket Engineering**” at A D Patel institute of technology on 5th August 2022.
- 4) Organized seminar on “**Entrepreneurship as a career**” at A D Patel institute of technology on 26th August 2022.
- 5) Organized one day workshop on “**Women Entrepreneurship opportunities in India**” at A D Patel institute of technology on 30th January 2021.
- 6) Organized webinar on “**Start and Grow**” under Entrepreneurship Development Cell on 7th Sep 2021 at A D Patel Institute of Technology.
- 7) Organized a webinar on “**Entrepreneurship Opportunities in Current Era**” on 28th Dec 2020 at A D Patel Institute of Technology.
- 8) Organized a webinar on “**The role of Youth in Technology**” on 15th October 2020 at A D Patel Institute of Technology.
- 9) Organized a webinar on “**Unity in diversity**” on 31st October 2020 at A D Patel Institute of Technology.
- 10) Organized a webinar on “**Environment awareness**” on 2nd July 2021 at A D Patel Institute of Technology.

Outreach Activity



- 1) Attended Five-day e short term course(e-STC) on “**The Art of Writing Research Articles and Scholarly Publications in English Language and Literature**” organized by the Department of humanities and social science, National Institute of Technology Hamirpur, Himachal Pradesh from 29 January, 2024 to 02 February 2024.
- 2) Attended Five-day e short term course(e-STC) on “**Instrumental Techniques for Molecular Analysis (ITMA-2024)**” organized by the Department of Chemistry, National Institute of Technology Hamirpur, Himachal Pradesh from 21st -25th May, 2024.
- 3) Attended one-week short term training program on “**MATLAB and its**”

Application in Engineering and Research (MATER-2024) organized by the Department of Chemical Engineering, Sardar Vallabhbhai Patel National Institute of Technology, Surat, Gujarat, India, held during January 08th-12th, 2024.

- 4) Attended two days Faculty Development Programme on **"Role of Engineering Towards Attainment of Sustainable Development Goal"** organized by the Department of Mechanical and Electrical Engineering, SS Polytechnic College, Udaipur, India, held during June 07th-8th, 2024.
- 5) Attended one week Faculty Development Programme on **"Modern Manufacturing in Industry 4.0 (MMI-2023)"** organized by the Department of Mechanical Engineering, National Institute of Technology Delhi, India, held during February 07th-12th, 2023.
- 6) Attended one week Faculty Development Programme on **"Modern Manufacturing in Industry 4.0 (MMI-2023)"** organized by the Department of Mechanical Engineering, National Institute of Technology Delhi, India, held during February 07th-12th, 2023.
- 7) Attended one week FDP on **"Advanced Characterization Techniques (ACT-2022)"** organized by Department of Chemistry, UIS, Chandigarh University, Mohali, Punjab from 25th July 2022 to 30th July 2022.
- 8) Attended Online Elementary FDP on **"Recent Advances in Composites and Nano Materials"** from 13/12/2021 to 17/12/2021 at Dr Ambedkar Institute of Technology.
- 9) Attended FDP on **"Current Trend in Engineering Nano-Materials, Characterizations & Their Applications "** from 06/12/2021 to 10/12/2021 at Indira Gandhi National Tribal University.
- 10) Attended Online Elementary FDP on **"Innovations in Manufacturing of Novel Materials and Composites"** from 23/11/2021 to 27/11/2021 at Christian College of Engineering and Technology.
- 11) Attended FDP on **"Modeling Approach in Micro - Machining Processes"** 26th-30th October, 2020 Organized by Department of Mechanical Engineering, School of Technology, Pandit Deendayal Petroleum University, Gandhinagar.
- 12) Attended Online FDP on **"Green Technology & Sustainability Engineering"** from 2020-9-21 to 2020-9-25 at A D Patel Institute of Technology.
- 13) Attended Online STTP on **"Applied Computational Fluid Dynamics for Renewable Energy and Hydraulic Machines Sector"** from 01st to 05th February, 2021 at A D Patel Institute of Technology.
- 14) Attended Online STTP on **"Applied Computational Fluid Dynamics for Engineers"** from 14th to 18th December, 2020 at A D Patel Institute of Technology.

15) Attended Online STTP on “**Applied Computational Fluid Dynamics for Automotive space and defense sector**” from 01st to 05th March, 2021 at A D Pate Institute of Technology.

Social Activities

- Organized many blood donation camps and thalassemia awareness and testing camps, Covid 19 vaccination camps, tree plantation events women health and hygiene events and human values expert talks.
- Serving as NSS Program Officer at ADIT.

Professional Affiliations

Lifetime member of Indian Society for Technical Education.

Computer Proficiency

- Ansys
- Origin
- Microsoft
- AutoCAD
- Fluidsim
- MATLAB

Languages

Gujarati Hindi English

Interests & Skills

- Writing and presenting reports
- Research
- Educational Development
- Exposure of new technologies
- Field trip
- Lab development
- Mentoring
- Industrial Interaction

Personal Details

Father's Name	Late. Ramanbhai Rathod	Marital status	Married
Birthdate	16 th July 1980	Nationality	Indian
Gender	Female	Blood Group	O +ve

My Address

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References



Dr. Vijay H Makwana
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I, Manisha V Makwana, hereby declare that the information contained herein is true and correct to the best of my knowledge and belief.

Manisha V Makwana