Dr. Mohd Taazeem Ansari

(Ph.D.)
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RESEARCH INTEREST

- *Computational modeling and simulation of 2D nanomaterials for applications in nanoelectronics*.
- *Nano sensors for environmental applications.*

EDUCATION DETAILS

- **Ph.D. Applied Physics, Jamia Millia Islamia, New Delhi, India** ***2017–2021***
  Thesis*: Modelling of miniaturized functional devices employing quantum mechanical methods for applications in Nano Electronics*

- **Master of Science (Electronics), Jamia Millia Islamia University, New Delhi, India** ***2012–2014***
  Dissertation*: Designing of a "Software for Simulation of Op-Amp circuits" using C programming*
  Internship*: Dielectric properties of sol-gel derived Barium Strontium Titanate*
  Overall, first division (**81.60%).**

- **Bachelor of Science (Hons) (Electronics), University of Delhi, New Delhi, India** ***2009–2012***
  Theory Project: Designing a Security alarm system" based on 8085 microprocessors.
  Overall, first division (**74.60%**).

EXPERIENCE

ACADEMIC AND RESEARCH EXPERIENCE *3 YEARS*

- **Assistant Professor (Guest)**
  Faculty of Engineering & Technology, Jamia Millia Islamia, New Delhi, India ***2024-ongoing***

- **Assistant Professor (Guest)** ***2021-2023***
  Faculty of Engineering & Technology, Jamia Millia Islamia, New Delhi, India
  - *Outlined learning outcomes and targets at the start of lessons to help focus and motivate students.*
  - *I taught subjects like* ***Nanoelectronics****,* ***Nanotechnology, Semiconductor Device Physics, Engineering Physics, Analog Electronics****,* ***Opto-electronics, Computational method in Electronics etc.***

- **Faculty for ECE at Sri Venkateshwara University through Blackboard Education and Research Foundation Pvt Ltd, India** ***2023-2024***
  - *Outlined learning outcomes and targets at the start of lessons to help focus and motivate students.*
  - *I taught subjects like* ***Analog and digital communication, Digital System Design, Wireless Sensor Network, RTL simulation and synthesis with PLDs, VHDL and Verilog etc.***

AWARDS & ACCOMPLISHMENTS

- Worked as a volunteer for **Commonwealth Games 2010** with job title "**City Operationalist**" held in New Delhi, India during October 3-14, 2010.
- Recipients of **Urdu Academy Excellence Award,** three times (Based on the Academic Excellence in Urdu language)
- Recipients of Central Govt. of. India Minority Scholarship two times (Based on the Academic Excellence).

SKILLS

- **Scientific:**
  - Hands on experience with computational tools: **ATK-VNL by Quantum wise (now Synopsis).**
  - Operated Instrument: **Agilent LCR meter** for experimentally calculating various physical parameters such as dielectric constant, impedance analysis, etc.
- **Computer Applications**: MS Office, Origin, etc.
- **Language** – English (Advanced), Urdu (Advanced), Hindi (Native).

PATENT

S. No.	Patent
1.	Patent titled as "*GRAPHENE NANORIBBON FIELD EFFECT TRANSISTOR BASED OPERATIONAL TRANSCONDUCTANCE AMPLIFIER WITH HIGH SLEW RATE FOR BIO-SIGNAL* with reference No 202311061483 A has been published on **13/10/2023 (**The Patent Office Journal No. **41/2023).** **Summary:** An analog signal processing device is needed in the circuit for the acquisition and initial processing of a physiological signal from the human body and animal such as an ECG/EKG, EEG, EMG, or EOG for further digital signal processing. The depolarization of the plasma membrane in plants is shown to be the source of action potential, which serve as electrical signals. Due to cell membrane impedances, the electrical measurement from a plant is recorded using different amplifiers. A novel Graphene Nanoribbon Field Effect Transistor based operational transconductance amplifier with high slew rate for Bio-Signal is shown. A GNRFET's channel is constructed by a parallel combination of Graphene Nano Ribbons (GNR), just like a conventional Metal Oxide Semiconductor Field Effect Transistor (MOSFET). Due to their high charge carrier velocity, fast switching, higher Ion/Ioff ratio, and low energy-delay product (EDP), GNR field-effect transistors (GNRFETs) are a superior alternative to silicon transistors. Furthermore, a simulation analysis demonstrates that the ultra-high slew rate and voltage gain achieved are 35865 V/µS and 29.91 dB, respectively.
2.	Patent titled as "*CMOS BASED OPERATIONAL AMPLIFIER WITH IMPROVED GAIN AND BANDWIDTH USING TRIPLE CASCODE OPERATIONAL TRANSCONDUCTANCE AMPLIFIER" Application No. 202411083285,* published in India (The Patent Office Journal No. **50/2024**).

	Summary: To capture and initialize a physiological signal from the human body, such as Electroencephalogram (EEG), Electrooculogram (EOG), Electrocardiogram (ECG), and Electromyogram (EMG) for subsequent digital signal processing, the circuit requires an analog signal processor. Operational Amplifier (Op-Amp) circuits are crucial in designing high-precision analog and mixed-signal blocks. Proper operational amplifier design affects the performance of a mixed signal integrated circuit system. A novel CMOS-based operational amplifier with improved gain and bandwidth is shown using a triple cascode operational transconductance amplifier. Op amp circuits have replaced conventional solid-state analog control systems for biomedical signal processing and communication applications. The first stage involves an operational transconductance amplifier (OTA) with a single-ended output. The following stage involves a common source (CS) output stage with an active load. Furthermore, Simulation research shows a voltage gain of 35.78 dB, a bandwidth of 13.65 GHz, and an average power of 119.45 μW at the 45 nm technology node.

PUBLICATIONS

S. No.	Research Article	I. F.
1.	Husain, M. M., **Ansari, M. T**., Almohammedi, **(2024)**. Influence of varying carbon oxides concentrations on the selectivity of an electrical sensor utilizing graphene nanoribbons Micro and Nanostructure, Elsevier. **DOI:** https://authors.elsevier.com/sd/article/S2773-0123(24)00062-1	**3.1 Q2**
2.	Husain, M. M., **Ansari, M. T**., & Almohammedi, A. **(2024)**. Analyzing the electronic and conductive characteristics of zigzag graphene nanoribbons upon NOx and N2O Adsorption: An ab-initio study. *Materials Today Communications*, 108725. **DOI:** https://doi.org/10.1016/j.mtcomm.2024.108725	**3.8 Q2**
3.	Siddiqui, V. U., Ansari, A., **Ansari, M. T.,** Akram, M. K., & Siddiqi, W. A. (2022). Fabrication of a zinc oxide/alginate (ZnO/Alg) bionanocomposite for enhanced dye degradation and its optimization study. RSC Advances, 12(12), 7210-7228. **DOI:** https://doi.org/10.1039/D1RA08991A	**3.361 Q1**
4.	**Ansari, M. T**., Almohammedi, A., Rafat, M., & Husain, M. M. (2021). Occurrence of nonohmic trend in the ballistic transport mode of a modelled low dimensional device capable of performing electronic functions. Superlattices and Microstructures, 106808. **DOI:** https://doi.org/10.1016/j.spmi.2021.106808	**3.220 Q2**
5.	Siddiqui VU, Ansari A, **Ansari M. T**, Akram MK, Siddiqi WA, Alosaimi AM, Hussein MA, Rafatullah M. Optimization of Facile Synthesized ZnO/CuO Nanophotocatalyst for Organic Dye Degradation by Visible Light Irradiation Using Response Surface Methodology. Catalysts. 2021; 11(12):1509. **DOI:** https://doi.org/10.3390/catal11121509	**4.146 Q2**
6.	**Ansari, M. T**., Rafat, M., Almohammedi, A., & Husain, M. M. (2020). Appearance of Conducting Behavior in a One-Dimensional Nano Resistor Identical to a Semiconductor Diode. *Journal of Atomic, Molecular, Condensate and Nano Physics*, *7*(1), 61-72. **DOI:** https://doi.org/10.26713/jamcnp.v7i1.1392	
7.	**Ansari, M. T.**, Husain, M. M., & Rafat, M. (2018, November). Modeling of carbon chain device employing quantum mechanical method: a hybrid diode. In 2018 IEEE Electron Devices Kolkata Conference (EDKCON) (pp. 1-7). IEEE. **DOI:** https://doi.org/10.1109/EDKCON.2018.8770516	

SCIENTIFIC ACTIVITIES

- Editorial team member for Physics in Journal of Research in Science, Engineering and Technology. *https://journals.researchub.org/index.php/jrset/about/editorialTeam*

- **Guest Editor** for a special issue on "Designing High-Performance Metal Oxide Nanostructures for Optoelectronic Applications" in ***Frontier in Photonics*** **Journal** https://lnkd.in/gEjYuaUX

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INVITED TALK IN SYMPOSIUMS/WEBINARS/CONFERENCES

- Delivered an invited talk on "***Quantum simulation of Miniaturized nano components using graphene, GNRs, CNTs and Allied Materials for electronic devices as well as sensing applications***" in International Virtual Conference on Materials and Research held between 26th – 27th Aug 2021 at SRM Easwari Engineering College, Chennai Tamil Nadu, India.
- Presented an invited talk on topic title "***A DFT study of ultra-sensitive graphene nanoribbon for detecting environmental pollutants with superior adsorption and distinct sensor response***" in International online conference on basic sciences for sustainable development (ICBSSD-2022) on 16-17 Dec 2022.

SYMPOSIUMS/WEBINARS/CONFERENCES ATTENDED

- Presented a single figure presentation (SFP) on topic title "***Response analysis of zigzag graphene nanoribbon towards CO & CO2 gas molecules with varying concentration: An ab- initio-investigation***" at the Virtual Winter School on Computational Chemistry held between 06 and 10 February 2023.

- Presented a paper title "***Response analysis of gold + graphene hybrid structure for sensing application: a first principal study***" in an oral presentation session in e-Workshop on Advances in Science and Technology of Graphene-2022, 1st & 2nd November.

- Successfully completed the AICTE Sponsored event **"*STTP on Simulation with MATLAB-From Device to Circuit"***, Phase-II, held from 30.08.2021 to 04.09.2021, organized by BSHU, JIS College of Engineering, Kalyani, India.

- Successfully completed one day workshop on Microsoft - Emerging Technologies held on 28-08-2021, **certified by Microsoft**.

- Attended the ACS Science talk on Multimetallic Nanocrystals by Design (part of ACS Science talk virtual lecture series) held on 19 February 2021.

- Participated in "Winter School on Materials Characterization Techniques" [International Conference on Multifunctional Nanomaterials (ICMN 2020)], organized by Manipal University Jaipur (MUJ), Jaipur, Rajasthan, India during 26-27, 2020.

- Participated in "Graphene For Energy Storage Application" held on 17 June 2020, organized by GRAPHENE Flagship in association with CHALMERS University of Technology, funded by the European Union.

- Presented a paper title "**Occurrence of unusual conductance trend in a coupled carbon chain resistor capable of performing electronics functions at nano dimensions**" in an oral presentation session in "*Interdisciplinary*

Science conference: Big Data and computational Biology", 21- 22 October 2019 at Centre for Interdisciplinary Research in Basic Sciences, Jamia Millia Islamia, New Delhi, 110025.

- Presented a paper title "**Modeling of carbon chain device employing quantum mechanical method: A hybrid diode**" in an oral presentation session in IEEE EDKON held in The Pride Hotel, Kolkata, India on 24th- 25th November 2018.

DECLARATION

I hereby declare that the information and details provided in this resume are correct and inclusive to the best of my knowledge and belief.

Dr. Mohd Taazeem Ansari