Dr. Mudasir A. Khanday
Assistant Professor, Department of Electronics
Government Degree College, Anantnag, J&K, India
mudasirakhanday@gmail.com
mudasirkhanday@gdcboysang.ac.in
+91-6006091868

Short Biography

Dr. Mudasir A. Khanday is an Assistant Professor in the Department of Electronics at Government Degree College, Anantnag, J&K, India. He obtained his B.Tech. degree in Electronics and Communication Engineering from Kurukshetra University, Haryana, India, and his M.Sc. degree in Electronics from the University of Kashmir, J&K, India. He was admitted to the M.Sc. program under the PG Merit Scholarship and was awarded the University Gold Medal for his outstanding academic performance.
He received his Ph.D. in Electronics with specialization in neuromorphic computing from the University of Kashmir under the Junior Research Fellowship (JRF), later upgraded to Senior Research Fellowship (SRF), awarded by the University Grants Commission (UGC), Government of India. Dr. Khanday has qualified several national-level competitive examinations, including UGC NET-JRF (twice), GATE, and JKSET, along with PSU examinations such as DRDO and NTRO.
He has published more than 15 research articles in reputed peer-reviewed journals, including *IEEE Transactions on Electron Devices* and *IEEE Transactions on Nanotechnology*, and holds a patent titled *"Portable Microcontroller-Based Impedance Meter for Biological Tissue Analysis."* He is a member of IEEE, the IEEE Electron Devices Society, and the IEEE Solid-State Circuits Society, and serves as a reviewer for several reputed international journals.

Research Profile

Dr. Khanday's research focuses on nanoelectronic devices and neuromorphic computing, particularly the design and modeling of energy-efficient spiking neuron architectures and in-sensor computing systems. His work emphasizes steep-slope device technologies, including tunnel field-effect transistors (TFETs), ferroelectric FETs, and impact-ionization-based devices, for realizing compact, low-power, and high-speed neuromorphic circuits. His key contributions include single-transistor neuron implementations, threshold-switching devices, and hardware-efficient architectures for biomedical signal processing and intelligent sensing applications. His research also extends to dielectrically modulated FET-based biosensors and hybrid sensing-computing platforms, with publications in leading journals published by IEEE, Springer Nature, Elsevier, and Wiley.

Research Interests

1. Neuromorphic Computing
2. Spiking Neural Networks
3. In-Sensor Computing
4. Nanoelectronic Devices and Circuits
5. Biosensors

Education

1. **Ph.D. Electronics (Neuromorphic Computing)** – University of Kashmir, Srinagar, J&K, India
2. **M.Sc. Electronics (CGPA=9.41, Gold Medal)** – University of Kashmir, Srinagar, J&K, India
3. **B.Tech. Electronics & Comm. Engg.** – Kurukshetra University, Haryana, India

Experience

1. **Assistant Professor**
   Department of Electronics, Government Degree College, Anantnag, J&K, India
   July 2024 ─ Present

Academic Profiles

1. Webpage : https://gdcboysang.ac.in/Departments/Science/Electronics/
2. ORCID ID : https://orcid.org/0000-0002-8081-9133
3. Google Scholar : https://scholar.google.com/citations?user=6foAGxkAAAAJ&hl=en
4. Research Gate : https://www.researchgate.net/profile/Mudasir-Khanday-2
5. Vidwan ID : 577626
6. Web of Science : NMJ-6056-2025

Courses Taught

1. Circuit Theory and Network Analysis
2. Semiconductor Physics and Devices
3. Analog Electronics
4. Linear Integrated Circuits
5. Digital Circuits
6. Signals and Systems
7. Microprocessors and Microcontrollers
8. Consumer Electronics

Competitive Examinations, Awards, and Fellowships

1. Qualified UGC NET-JRF June-2018 in Electronic Science.
2. Qualified UGC NET-JRF Dec-2018 in Electronic Science.
3. Qualified JKSET 2023 in Electronic Science.
4. Qualified GATE in Electronics and Communication Engineering.
5. Qualified Scientist-B Exam (DRDO) in Electronics and Communication Engineering.
6. Qualified Sr. Technical Assist. Exam (NTRO) in Electronics and Communication Engineering.
7. Awarded UGC Senior Research Fellowship (SRF), 2023-24.
8. Awarded UGC Junior Research Fellowship (JRF), 2021-22.
9. Recipient of University Gold Medal (2020).
10. Recipient of University PG Merit Scholarship (2017).

Professional Membership

1. Member, IEEE
2. Member, IEEE Electron Devices Society (EDS)
3. Member, IEEE Solid-State Circuits Society (SSCS)
4. Member IEEE Technical Councils (Electronic Design Automation, RFID, Superconductivity, Nanotechnology, Sensors, Transportation Electrification)

Skills/Research Tools

1. Cadence Virtuoso, Sentaurus TCAD, ATLAS TCAD
2. MATLAB, Python, Verilog
3. SPICE, Multisim, RF Flow, Origin

Internship

1. NITTTR, Chandigarh — *Electronics for Better Future* (2013)
2. BSNL, Haryana — *Wireless and Mobile Communication* (2017)
3. NITTTR, Chandigarh — *Arduino for IoT (2020)*

Academic and Administrative Responsibilities

1. Coordinator, Department of Welding Technology (23 July 2024 – Present)
2. IPR Activity Coordinator, Innovation, Incubation and Entrepreneurship Cell (IIEC)
3. Member, Admission/NEP Committee
4. Member, Career Counselling Cell

5. Member, Research and Development Committee
6. Member, Skill Development Committee
7. Member, College Media Cell

Contribution to Organized Events

1. Served as Coordinator for the one-day workshop 'From Grassroots Problems to Scalable Startups: RBIC Idea Resonator on Agri. & Rural Innovation' organized by RBIC, SKUAST-K in collaboration with GDC, Anantnag, held on 15th April 2026.
2. Served as Co-Convener of the ICSSR-sponsored two-day National Seminar on 'Empowering Education through Emerging Electronics: Pedagogical Innovations and Policy Perspectives in the Age of Artificial Intelligence and Smart Technologies,' organized by GDC, Anantnag, held on 25th to 26th Nov. 2025.
3. Served as Editor of the Abstract Booklet for the ICSSR-sponsored two-day National Seminar on "Empowering Education through Emerging Electronics: Pedagogical Innovations and Policy Perspectives in the Age of Artificial Intelligence and Smart Technologies," organized by GDC, Anantnag, held on 25th to 26th Nov. 2025.

Professional Development Programs

1. Participated in the Guru-Dakshta Faculty Induction Programme organized by MMTTC Punjabi University, Patiala, Punjab, India, from 7th Jan. to 10th Feb. 2026.
2. Completed a self-paced course on 'Electric Vehicle Technologies' offered by Electronics and ICT Academy, IIT Roorkie, on 11th Mar. 2026.
3. Participated in a Short-Term Course on 'NextGen Pathways in VLSI and Communication Systems' conducted by Dept. of Electronics Engineering, NIT Uttarakhand, from 19th to 23rd Jan. 2026.
4. Participated in the workshop on 'Optoelectronic Devices' organized by Metachem Academy, from 19th to 21st Jan. 2026.
5. Attended a One-week Training Program on 'Computer-Interfaced Science Experiments using ExpEYES' conducted by Inter-University Accelerator Centre (IUAC), New Delhi, from 6th to 11th Oct. 2025.
6. Attended the IEEE Electron Device Society Distinguished Lecture on 'Heterogeneous Integration for AI Architectures' by Mukta G. Farooq, IBM Distinguished Scientist, Master Inventor; IBM Research – TJ Watson & Albany, on 20th Nov. 2024.
7. Attended the IEEE Electron Device Society Distinguished Lecture on 'Cryogenic Operation of Planar and Multigate FDSOI MOSFETs' by Prof. Marcelo A. Pavanello, Dept. of Electrical Engineering, Centro Universitario FEI, Sao Bernardo do Campo, Brazil, on 18th Nov. 2024.
8. Attended the IEEE Electron Device Society Distinguished Lecture on 'Outstanding High Transistor Mobility towards Three-Dimensional Brain-Mimicing IC Architecture' by Prof. Albert Chin, Dept. of Electronics Engineering, National Yang Ming Chiao Tung University, Hsinchu, Taiwan, on 4th Nov. 2024.
9. Participated in the International Faculty Development Program 'Tools & Techniques of AI in Future Research and Higher Education' organized by GDC Rajpora and Cape Comorin Trust, India, from 24th Sep. 2024 to 30th Sep. 2024.
10. Participated in the Global Initiative of Academic Networks (GIAN) course 'Neuromorphic Computing with Nanoscale Spintronic Devices' conducted by Dept. of Electronics & Communication Engineering, IIT Roorkee, from 19th Dec. 2022 to 23rd Dec. 2023.
11. Participated in the webinar on 'IEEE Authorship and Open Access Symposium' organized by the IEEE, on 26th Aug. 2021.
12. Participated in the webinar on 'Spectroscopy, Society and Environment' organized by the Indian Society of Analytical Scientists (ISAS), Mumbai, on 25th July 2020.

Patents

1. Khanday *et al.,* "Portable Microcontroller-Based Impedance Meter for Biological Tissue Analysis," Indian Patent 563600, Mar. 25, 2025.

Journal Publications

1. **M. A. Khanday**, and F. A. Khanday, "Low-voltage I-MOS neuron with biomimetic switching dynamics for neuromorphic systems," Micro and Nanostructures, vol. 210. Elsevier, p. 208477, Feb. 2026. doi: 10.1016/j.micrna.2025.208477.
2. R. A. Zargar, A. Bashir, A. A. Wani, **M. A. Khanday**, *et al.*, "Unravelling the magnetic properties of Fe0.5TeSe0.5 superconductor using Ginzburg–Landau (GL) formulation," Discover Materials, vol. 6, no. 1, Jan. 2026, doi: 10.1007/s43939-025-00411-7.
3. B. M. Zargar, **M. A. Khanday**, and F. A. Khanday, "SG-FET Based Spiking Neuron with Ultra-Low Energy Consumption for ECG Signal Classification," International Journal of Numerical Modelling: Electronic Networks, Devices and Fields, vol. 37, no. 6. Wiley, Nov. 2024. doi: 10.1002/jnm.70003.
4. I. Shakeel, S. Rashid, F. A. Khanday, and **M. A. Khanday**, "Dielectrically modulated hetero-material double gate tunnel field-effect transistor for label free biosensing," International Journal of Numerical Modelling: Electronic Networks, Devices and Fields, vol. 37, no. 2. Wiley, Mar. 2024. doi: 10.1002/jnm.3232.
5. **M. A. Khanday**, S. Rashid, and F. A. Khanday, "Energy efficient artificial gustatory system for in-sensor computing," Micro and Nanostructures, vol. 191. Elsevier, p. 207870, Jul. 2024. doi: 10.1016/j.micrna.2024.207870.
6. **M. A. Khanday,** and F. A. Khanday, "An energy-efficient tunable threshold spiking neuron with excitatory and inhibitory function," International Journal of Numerical Modelling: Electronic Networks, Devices and Fields, vol. 37, no. 2. Wiley, Mar. 2024. doi: 10.1002/jnm.3227.
7. **M. A. Khanday**, and F. A. Khanday, "A bio-inspired ferroelectric tunnel FET-based spiking neuron for high-speed energy efficient neuromorphic computing," Micro and Nanostructures, vol. 188. Elsevier, p. 207788, Apr. 2024. doi: 10.1016/j.micrna.2024.207788.
8. **M. A. Khanday**, S. Rashid, and F. A. Khanday, "1T Spiking Neuron Using Ferroelectric Junctionless FET with Ultra-Low Energy Consumption of 24 aJ/Spike," Neural Processing Letters, vol. 55, no. 8. Springer, pp. 11527–11539, Aug. 16, 2023. doi: 10.1007/s11063-023-11387-x.
9. **M. A. Khanday**, F. A. Khanday, F. Bashir, and F. Zahoor, "Exploiting Steep Sub-Threshold Swing of Tunnel FET for Energy-Efficient Leaky Integrate-and-Fire Neuron Model," IEEE Transactions on Nanotechnology, vol. 22. IEEE, pp. 430–435, 2023. doi: 10.1109/tnano.2023.3296557.
10. **M. A. Khanday**, F. A. Khanday, and F. Bashir, "Single SiGe Transistor Based Energy-Efficient Leaky Integrate-and-Fire Neuron for Neuromorphic Computing," Neural Processing Letters, vol. 55, no. 6. Springer, pp. 6997–7007, Mar. 28, 2023. doi: 10.1007/s11063-023-11245-w.
11. **M. A. Khanday**, F. Bashir, and F. A. Khanday, "Single Germanium MOSFET-Based Low Energy and Controllable Leaky Integrate-and-Fire Neuron for Spiking Neural Networks," IEEE Transactions on Electron Devices, vol. 69, no. 8. IEEE, pp. 4265–4270, Aug. 2022. doi: 10.1109/ted.2022.3186274.

Conference Proceedings

1. **M. A. Khanday**, and F. A. Khanday, "BTBT-based Energy Efficient Artificial Spiking Neuron without External Circuitry," *2023 International Conference on Computational Intelligence and Biological Sciences (ICCIBS 2023)*, Coimbatore, Tamil Nadu, India, Oct. 2023, pp. 329-332, ISBN: 978-93-5996-261-0.
2. **M. A. Khanday**, F. Bashir, and F. A. Khanday, "Energy-Efficient Single Transistor Neuron for Reconfigurable Threshold Logic and Image Classification," *2022 5th International Conference on*

Multimedia, Signal Processing and Communication Technologies (IMPACT 2022), Aligarh, India, Nov. 2022, pp. 1-4, doi: 10.1109/IMPACT55510.2022.10029223.

Book Chapters

1. **M. A. Khanday**, F. A. Khanday, and J. I. Reshi, "Spiking Neural Networks: Mathematical Models, Learning Algorithms, and Applications" in Energy-Efficient Devices and Circuits for Neuromorphic Computing, Elsevier, 2025, ch 1, pp. 1-28, doi: B978-0-443-29981-0.00002-1.
2. **M. A. Khanday**, and F. A. Khanday, "Artificial Spiking Neuron Devices and Circuits for Neuromorphic Computing" in Energy-Efficient Devices and Circuits for Neuromorphic Computing, Elsevier, 2025, ch 2, pp. 29-48, doi: B978-0-443-29981-0.00003-3.
3. I. Syed, **M. A. Khanday**, S. Rashid, and F. A. Khanday, "In-sensor Computing: A Comprehensive Review" in Energy-Efficient Devices and Circuits for Neuromorphic Computing, Elsevier, 2025, ch 8, pp. 245-284, doi: 10.1016/B978-0-443-29981-0.00010-0.

Abstracts

1. **M. A. Khanday**, and F. A. Khanday, "Smart Gadget Integration in Post COVID E-Learning Ecosystems," National Seminar on Empowering Education through Emerging Electronics: Pedagogical Innovations and Policy Perspectives in the Age of Artificial Intelligence and Smart Technologies, organized by Govt. Degree College, Anantnag, India, 25-26 Nov. 2025.

Dated: 23.06.2026