

Hiranya Ranjan Thakur, PhD (Tezpur University)

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Areas: Sensors and Bioelectronic devices

Qualification:

- Ph.D. in Electronics and Communication Engineering from Tezpur University in 2020.
- M.Tech. in Electronics and Communication Engineering from North Eastern Regional Institute of Science and Technology (NERIST) in 2014.
- B.Tech. in Electronics and Communication Engineering from Tezpur University in 2011.

Areas of Specialization:

- Sensors and Bioelectronic devices

Publications:

Journal Papers:

1. Dutta, J. C., **Thakur, H. R.**, and Keshwani, G. High performance Dual-Gate Carbon Nanotube Ion-Sensitive Field Effect Transistor with high- κ top gate and low- κ bottom gate dielectrics. *IEEE Sensors Journal*, 19(14):5692–5699, 2019. **DOI:** [10.1109/JSEN.2019.2904517](https://doi.org/10.1109/JSEN.2019.2904517), **ISSN:** 1558-1748, Date of Publication: 12 March 2019
2. **Thakur, H. R.** and Dutta, J. C. Modeling of Carbon nanotube ISFETs with high- κ Gate dielectrics for biosensing applications. *International Journal of Numerical Modelling: Electronic Networks, Devices and Fields*, 32(6):e2654, 2019. **DOI:** <https://doi.org/10.1002/jnm.2654>, First published: 15 July 2019, Online ISSN:1099-1204
3. Dutta, J. C. and **Thakur, H. R.** Sensitivity determination of CNT based ISFETs for different high- κ dielectric materials. *IEEE Sensors Letters*, 1(2):1–4, 2017. **DOI:** [10.1109/LSENS.2017.2695648](https://doi.org/10.1109/LSENS.2017.2695648), **ISSN:** 2475-1472, **Date of Publication:** 19 April 2017
4. Sharma, P. K., **Thakur, H. R.**, and Dutta, J. C. Modeling and simulation of carbon nanotube-based dual-gated enzyme field effect transistor for acetylcholine detection. *Journal of Computational Electronics*, 16(3):584-592, 2017. **DOI:** <https://doi.org/10.1007/s10825-017-0992-9>, **Electronic ISSN:** 1572-8137, **Published:** 29 April 2017
5. Hazarika, K., **Thakur, H. R.**, and Dutta, J. C. Fabrication and characterization of different polymer doped CNT nanocomposites for creatinine detection. *Materials Today: Proceedings*, 2023. **DOI:** <https://doi.org/10.1016/j.matpr.2023.01.032>, **Published :**13 January 2023
6. Saikia, O., Dutta, J. C. and **Thakur, H. R.** Carbon Nanotube Based Biologically Modified Field Effect Transistors (CNT-BioFETs): A Research Review. *Materials Today: Proceedings*, **DOI:** <https://doi.org/10.1016/j.matpr.2023.01.033>, **Published :**16 January 2023

Book Chapters:

7. Dutta, J. C., Sharma, P. K., and **Thakur, H. R.** Forty years of BioFETOLOGY: A Research Review. In Bhatia, S. K., Mishra, K. K., Tiwari, S. and Singh, V. K., editors, *Advances in Computer and Computational Sciences*, volume 553, pages 687-697, Springer, Nature, Singapore, 2017. **DOI:** https://doi.org/10.1007/978-981-10-3770-2_65, (**Online ISBN:** 978-981-10-3770-2, First Online: 28 May 2017, Publisher Name: Springer, Singapore)
8. Devi, K. S., Keshwani, G., **Thakur, H. R.**, and Dutta, J. C. Fabrication and Physical Characterization of Different Layers of CNT-BioFET for Creatinine Detection. In Deka, B., Maji, P., Mitra, S., Bhattacharyya, D., Bora, P., Pal, S., editors, *Pattern Recognition and Machine Intelligence*, volume 11942, pages 535-542, Springer, Cham, 2019. **DOI:** https://doi.org/10.1007/978-3-030-34872-4_59 (First Online: 25 November 2019, **Publisher Name:** Springer, Cham, **Online ISBN:** 978-3-030-34872-4)
9. **Thakur, H. R.**, Keshwani, G., Dutta, J. C. Modeling of Dual-Gate Carbon Nanotube Based Ion Sensitive Field Effect Transistor (DG-CNTISFET). In Mallick, P. K., Meher, P., Majumder, A., Das, S. K., editors, *Electronic Systems and Intelligent Computing*, volume 686, pages 377-385, Springer, Singapore, 2020. **DOI:** https://doi.org/10.1007/978-981-15-7031-5_36 (**First Online:** 23 September 2020, **Publisher Name:** Springer, Singapore, **Online ISBN:** 978-981-15-7031-5)
10. Keshwani, G., Hazarika, K., **Thakur, H. R.**, Dutta, J. C. Fabrication and Electrochemical Modeling of CNT-Based BioFET for Cholesterol Detection. In Mallick, P. K., Meher, P., Majumder, A., Das, S. K. editors, *Electronic Systems and Intelligent Computing*, volume 686, pages 429-437, Springer, Singapore, 2020. **DOI:** https://doi.org/10.1007/978-981-15-7031-5_41 (**First Online:** 23 September 2020, **Publisher Name:** Springer, Singapore, **Online ISBN:** 978-981-15-7031-5)

Conference Papers:

11. **Thakur, H. R.**, Keshwani, G., and Dutta, J. C. Sensitivity of Carbon Nanotube Based Ion Sensitive Field Effect Transistor (CNTISFET) for HfO₂ and ZrO₂ gate dielectrics: Experimental and Theoretical Investigation. In *IEEE International Conference on Innovations in Electronics, Signal Processing and Communication (IESC' 2017)*, pages 137-142, NIT, Meghalaya, Shillong, 2017. **DOI:** [10.1109/IESPC.2017.8071880](https://doi.org/10.1109/IESPC.2017.8071880) (**Date Added to IEEE Xplore:** 19 October 2017, ISBN: 978-1-5090-5621-7, **Conference Location:** NIT Meghalaya, Shillong, India)
12. Sharma, P. K., **Thakur, H. R.**, and Dutta, J. C. Fabrication and characterization of a Carbon Nanotube based Junctionless Ion Sensitive Field Effect Transistor (CNT-JLISFET). In *IEEE International Conference on Computing Communication and Automation (ICCCA-2016)*, pages 1450-1453, Greater Noida, Uttar Pradesh, 2016. **DOI:** [10.1109/CCAA.2016.7813948](https://doi.org/10.1109/CCAA.2016.7813948) (**Date Added to IEEE Xplore:** 16 January 2017, **ISBN:** 978-1-5090-1667-9, **Conference Location:** Galgotias University, Greater Noida, Uttar Pradesh, India)
13. Sharma, P. K., **Thakur, H. R.**, and Dutta, J. C. Effect of different dielectric materials on enzyme field effect transistor. In *IEEE International Conference on Computing Communication and Automation (ICCCA-2017)*, pages 1457-1460, Greater Noida, Uttar Pradesh, 2017. **DOI:** [10.1109/CCAA.2017.8230029](https://doi.org/10.1109/CCAA.2017.8230029) (**Date Added to IEEE Xplore:** 21 December 2017, **ISBN:** 978-1-5090-6472-4, **Conference Location:** Galgotias University, Greater Noida, Uttar Pradesh, India)

14. **Thakur, H. R.**, Keshwani, G., and Dutta, J. C. Physical model for drift in carbon nanotube based ZrO₂ gate dielectric ion sensitive field effect transistor. In *IEEE International Conference on Innovations in Electronics, Signal Processing and Communication* (IESC' 2019), pages, 76-79, Shillong, India, 2019. **DOI:** [10.1109/IESPC.2019.8902394](https://doi.org/10.1109/IESPC.2019.8902394) (**Date Added to IEEE Xplore:** 18 November 2019, **ISBN:** 978-1-7281-0745-5, **Conference Location:** NIT Meghalaya, Shillong, India)
15. Keshwani, G., **Thakur, H. R.**, and Dutta, J. C. Characterization of thin zirconia films deposited by ECD on ITO coated glass for biosensing applications. In *International Conference on Signal Processing and Integrated Networks* (SPIN-2019), pages 776-779, Noida, Delhi, 2019. **DOI:** [10.1109/SPIN.2019.8711640](https://doi.org/10.1109/SPIN.2019.8711640) (**Date Added to IEEE Xplore:** 13 May 2019, **ISBN:** 978-1-7281-1381-4, **Conference Location:** Amity University, Noida, India)
16. Keshwani, G., **Thakur, H. R.**, and Dutta, J. C. Fabrication and electrical characterization of carbon nanotube based enzyme field effect transistor for cholesterol detection. In *TENCON 2019-2019 IEEE Region 10 Conference (TENCON)*, pages 1821-1824, Kochi, India, 2019. **DOI:** [10.1109/TENCON.2019.8929330](https://doi.org/10.1109/TENCON.2019.8929330) (**Date Added to IEEE Xplore:** 12 December 2019, **ISSN:** 2159-3450, **Conference Location:** Kochi, India)
17. Hazarika, D. J., **Thakur, H. R.**, and Dutta, J. C. Synthesis and Characterization of High-κ Dielectric Zirconium Oxide for Biosensor Applications. In *International Conference on Material Science and Computational Engineering* (ICMCE 2022), Kollam, India, 2022. (In press)

Scholarships and Awards:

1. Fellowship under Visvesvaraya PhD Scheme for Electronics & IT, Ministry of Electronics and Information Technology (MCIT), Government of India during PhD (2015-2020).

Teaching Experience:

1. Currently, Guest Faculty in the department of ECE, Tezpur University, Tezpur from 13/01/2023.
2. Guest Faculty in the department of ECE, Tezpur University, Tezpur from 26/07/2022 to 31/12/2022.
3. Guest Faculty in the department of ECE, Tezpur University, Tezpur from 17/01/2022 to 30/06/2022.
4. Guest Faculty in the department of ECE, Tezpur University, Tezpur from 06/10/2021 to 31/12/2021.
5. Assistant Professor in Girijananda Chowdhury Institute of Management and Technology, Tezpur (GIMT-Tezpur) from 01/08/2014 to 08/09/2015.

Courses Taught:

1. Design of Digital Systems (EL-531)
2. Control System (EC-311)
3. Computer Network (EC-312)
4. Computer Network Lab (EC-313)
5. Digital System Design Lab (EC-204)