

Rupam Goswami

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EDUCATION

Doctor of Philosophy (PhD), Department of Electronics and Communication Engineering, National Institute of Technology Silchar, Assam, India: December, 2017

Master of Technology in Microelectronics & VLSI Design, Department of Electronics & Communication Engineering, National Institute of Technology Silchar, Assam, India: 2012 – 2014

Bachelor of Engineering in Electronics & Telecommunication Engineering, Gauhati University, Assam Engineering College, Guwahati, Assam, India: 2012

Higher Secondary Final Examination, Assam Higher Secondary Education Council (AHSEC), Cotton College, Guwahati Assam, India: 2008

High School Leaving Certificate Examination, Board of Secondary Education Assam (SEBA), Don Bosco School Sonaighuli, Guwahati, Assam, India: 2006

EXPERIENCE

Tezpur University **February, 2020 - present**
Assistant Professor, Department of Electronics and Communication Engineering

- Teaching UG subjects for the department
- Handling departmental website updates

Birla Institute of Technology and Science Pilani **August, 2018 – February 2020**
Assistant Professor, Department of Electrical and Electronics Engineering

- Taught undergraduate courses on Electronic Devices, Analog and Digital VLSI Design, Electrical Sciences, Microelectronic Circuits and Analog Electronics
- Taught Physics and Modeling of Microelectronic Devices for postgraduate students

Kalinga Institute of Industrial Technology (KIIT) University **July, 2017 – July, 2018**
Assistant Professor, School of Electronics Engineering

- Taught subject Microprocessor and Microcontroller to B. Tech 5th semester students

National Institute of Technology Silchar, Assam, India **February, 2017 – May, 2017**
Temporary Faculty, Department of Electronics and Communication Engineering

- Taught subjects, Optimization Methods in Engineering (B. Tech 8th Semester) and Basic Electronics (B. Tech 2nd Semester).
- Was in-charge of Departmental Examination Cell.

SPONSORED RESEARCH PROJECTS

- **Nanocavity-in-Body Tunnel Field Effect Transistor Architectures for Low Power Sensing Applications** sponsored by SERB - Department of Science and Technology, Govt. of India: 2019-2021; Role: PI, Total Funds: 10.49 lakhs INR.
- **Carbon nanomaterials for chemical sensing applications** sponsored by Ministry of Human Resource and Development under SPARC scheme: 2019-2021 (ID: 1394); Role: Co-PI, Total Funds: 46.11 lakhs INR
- **Gate-On-Source/Channel TFETs for Label-Free Biosensing: experiment and simulation** sponsored by TEQIP under TEQIP Collaborative Research Scheme: 2019-2020; Role: Co-PI, Total Funds: 15.60 lakhs INR.

PATENTS

- Filed an Indian Patent having NO. **201811025225** on July 7, 2018
- Filed an Indian Patent having NO. **201731000942** on January 10, 2017.

RESEARCH PUBLICATIONS

Book Chapters

1. Rupam Goswami, Arighna Deb, Rithik Rathi, Prateek Mahajan, "Design and Analyses of a Food Protein Sensing System Based On Memristive Properties", *Electrical and Electronic Devices, Materials and Circuits: Technological Challenges and Solutions*, eds. Suman Lata Tripathi, Pervej Ahmad Alvi, Umashankar Subramaniam, Accepted (*in Press*)
2. Rupam Goswami and Brinda Bhowmick, "Dielectric-Modulated TFETs as Label-Free Biosensors", Design, Simulation and Construction of Field Effect Transistors, *IntechOpen*, ed. Dhanasekaran Vikraman, Chapter 2, pp. 17-35, 2018.
3. Brinda Bhowmick and Rupam Goswami, "Bandgap Modulated Tunnel FET", Design, Simulation and Construction of Field Effect Transistors, *IntechOpen*, ed. Dhanasekaran Vikraman, Chapter 3, pp. 37-51, 2018.

International Journals

1. Mohil Desai, Kavindra Kandpal and Rupam Goswami, "A Multiple-Trapping-and-Release Transport Based Threshold Voltage Model for Oxide Thin Film Transistors", *Journal of Electronic Materials*, Accepted on March 24, 2021
2. Aditya Sodhani, Rupam Goswami, and Kavindra Kandpal, "Design of Pixel Circuit Using a-IGZO TFTs to Enhance Uniformity of AMOLED Displays by Threshold Voltage Compensation", *Arab J Sci Eng* (2021). doi: <https://doi.org/10.1007/s13369-021-05457-2>
3. Rajesh Saha, DK Panda, Rupam Goswami, Brinda Bhowmick, and Srimanta Baishya, "Analysis on effect of lateral straggle on analog, high frequency and DC parameters in Ge-source DMDG TFET", *Int J RF Microw Comput Aided Eng*. 2021; 31:e22579. <https://doi.org/10.1002/mmce.22579>
4. Manan Mehta, and Rupam Goswami, "Perspectives on Dielectric Modulated Biosensing in Silicon Tunnel FETs", *Silicon* (2021). doi: <https://doi.org/10.1007/s12633-021-00945-4>
5. Sambhavi Shukla and Rupam Goswami, "Perspective - Performance Assessment of TFETs for Low Power Applications: Challenges and Prospects", *ECS Journal of Solid State Science and Technology*, vol. 9, 2020. doi: 10.1149/2162-8777/abb797
6. Rajesh Saha, **Rupam Goswami**, Srimanta Baishya and Brinda Bhowmick, "Dependence of RF/Analog and Linearity Figure of Merits on Temperature in Ferroelectric FinFET: A Simulation Study", *IEEE Transactions on Ultrasonics, Ferroelectrics, and Frequency Control*, Accepted on May 31, 2020
7. Pratyush Manocha, Kavindra Kandpal and **Rupam Goswami**, "Selection of Low Dimensional Material Alternatives to Silicon for Next Generation Tunnel Field Effect Transistors", *Silicon*, Accepted on March 3, 2020 (DOI/ volume not assigned)
8. Puja Ghosh, **Rupam Goswami** and Brinda Bhowmick, "Optimization of Ferroelectric Tunnel Junction TFET in presence of temperature and its RF analysis", *Microelectronics Journal*, vol. 92, Oct. 2019. doi: 10.1016/j.mejo.2019.104618
9. Rupam Goswami and **Brinda Bhowmick**, "Comparative Analyses of Circular Gate TFET and Heterojunction TFET for Dielectric-Modulated Label-Free Biosensing", *IEEE Sensors*, vol. 19, no. 21, Nov. 2019, doi: 10.1109/JSEN.2019.2928182
10. Ayan Saikia, Ashish Raj and **Rupam Goswami**, "TCAD Calibration and Performance Investigation of an ISFET-based TNT (Explosive) Sensor", *Journal of Computational Electronics*, vol. 18, no. 4, pp. 1469-1477, 2019. DOI: 10.1007/s10825-019-01373-9
11. Sushree A. Sahu, **Rupam Goswami** and Sushanta Mohapatra, "Characteristic Enhancement of Hetero Dielectric DG TFET using SiGe pocket at Source/Channel interface: proposal and investigation," *Silicon*, 2019. DOI: 10.1007/s12633-019-00159-9 [issue not assigned]
12. **Rupam Goswami** and Brinda Bhowmick, "An Analytical Model of Drain Current in a Nanoscale Circular Gate TFET," *IEEE Transactions on Electron Devices*, vol. 64, no. 1, pp. 45-51, January 2017.
13. **Rupam Goswami** and Brinda Bhowmick, "An Algorithm for Extraction of Threshold Voltage in Heterojunction TFETs," *IEEE Transactions on Nanotechnology*, vol. 16, no. 1, pp. 90-93, January 2017.
14. **Rupam Goswami**, Brinda Bhowmick and Srimanta Baishya, "Effect of scaling on noise in Circular Gate TFET and its application as a digital inverter", *Microelectronics Journal*, vol. 53, pp. 16-24, July, 2016.

15. Basab Das, **Rupam Goswami** and Brinda Bhowmick, "A physics-based potential and electric field model of a nanoscale rectangular high-K gate dielectric HEMT", *Pramana*, vol. 86, no. 4, pp. 723-736, April, 2016.
16. Suman Kr. Mitra, **Rupam Goswami**, Brinda Bhowmick, "A hetero-dielectric stack gate SOI-TFET with back gate and its application as a digital inverter", *Superlattices and Microstructures*, vol. 92, pp. 37-51, Apr. 2016.
17. Rajashree Das, **Rupam Goswami** and Srimanta Baishya, "Tri-gate heterojunction SOI Ge-FinFETs", *Superlattices and Microstructures*, vol. 91, pp. 51-61, Mar. 2016.
18. **Rupam Goswami**, Brinda Bhowmick and Srimanta Baishya, "Physics-based surface potential, electric field and drain current model of a $\text{Si}_{1-x}\text{Ge}_x$ Gate-Drain Underlap Nanoscale TFET", *International Journal of Electronics*, vol. 103, no. 9, pp. 1566-1579, Feb. 2016
19. **Rupam Goswami**, Brinda Bhowmick and Srimanta Baishya, "Electrical noise in Circular Gate Tunnel FET in presence of interface traps", *Superlattices and Microstructures*, vol. 86, pp. 342-354, Oct. 2015.
20. Rupam Goswami and Brinda Bhowmick, "A temperature-dependent surface potential-based algorithm for extraction of threshold voltage in TFETs", *International Journal of Numerical Modelling: Electronic Networks, Devices and Fields* (Wiley; IF: 0.816), vol. 31, no. 3, April 2018. doi:10.1002/jnm.2304

International Conferences

1. Rajesh Saha, **Rupam Goswami**, Brinda Bhowmick and Srimanta Baishya, "Electrical Performance of Gate Modulated TFET (GM-TFET) with Epitaxial Layer", 7th International Conference on Microelectronics, Circuits and Systems 2020 (Micro 2020), Delhi Technological University, Delhi, July 25-26, 2020. [Best Session Paper Award]
2. Sahil Jakhar, Vishal Singh Mandloi, **Rupam Goswami**, Kavindra Kandpal, "A Low Power, High Speed 1.2 V Dynamic Comparator for Analog-to-Digital Converters", *Procedia Computer Science* (Third International Conference on Computing and Network Communications (CoCoNet'19)), Trivandrum, Kerala, Dec 18-21, 2019.
3. **Rupam Goswami** and Kavindra Kandpal, "Bottom Gate ZnO TFT as a Dielectric Modulated Label Free Biosensor", *28th International Conference on Amorphous and Nanocrystalline Semiconductors*, Aug. 4-9, 2019, Palasseiu, France
4. Satya Narayan Mishra, Kanjalochan Jena, **Rupam Goswami** and Anand Agarwal, "Field-Plated AlInN/AlN/GaN MOSHEMT with Improved RF Power Performance", *Advances in Signal Processing: Select Proceedings of ICSC 2018*, vol. 526, pp. 611-617, 2018, Noida, India
5. Subham Mishra, Sourabh Verma, Somendra Prasad, Sushanta S. Bordoloi, **Rupam Goswami**, Kanjalochan Jena, Vikas Kumar Jha, K. Parvathi, "A Low Cost Charcoal Film Based Moisture Sensor: fabrication and computing", *Third International Conference on Soft Computing and Applications (SOCTA 2018)*, Dec. 21-23, 2018, NIT Jalandhar, India
6. **Rupam Goswami**, Brinda Bhowmick, "Circular Gate Tunnel FET: Optimization and Noise Analysis", *Procedia Computer Science: International Conference on Advances in Computing and Communication*, vol. 93, pp. 125-131, 2016, Kochi, India
7. Suman Kumar Mitra, **Rupam Goswami** and Brinda Bhowmick, "Optimization and Scaling of a SOI TFET with Back Gate Control", *Proceedings of Recent Development of Control, Automation and Power Engineering (RDCAPE)*, pp. 7-9, 2015, Noida, India
8. Suman Kr. Mitra, **Rupam Goswami**, and B. Bhowmick, "A Dual Dielectric Step-Gate Tunnel FET", *Proceedings of CCEEDS and EEECOS 2015*, pp. 70-75, 2015, Lankapalli, Andhra Pradesh, India
9. **Rupam Goswami** and B. Bhowmick, "Hetero-gate-dielectric gate-drain underlap nanoscale TFET with a δp^+ $\text{Si}_{1-x}\text{Ge}_x$ layer at source-channel tunnel junction," in *Proceedings of International Conference on Green Computing Communication and Electrical Engineering (ICGCCCE)*, pp. 1-5, 2014, Coimbatore, India
10. B. Bhowmick, S. Baishya, **Rupam Goswami**, B. Dasv and C. Joishy, "An optimized SOI g-TFET and its application in a half adder circuit," in *Proceedings of 2nd International Conference on Devices, Circuits and Systems (ICDCS)*, pp. 1-5, 2014, Coimbatore, India

LECTURES DELIVERED

- Webinar on *The Art of Learning Semiconductor Devices: pn junctions, MOSFETs and memristors* on June 29, 2020 hosted by the Department of Electronics and Communication Engineering, Madanepelle Institute of Technology and Science, Andhra Pradesh, India
- Webinar on *Emerging Semiconductor Devices: trends and challenges* on May 28, 2020 hosted by Department of Electronics and Communication Engineering, Harcourt Butler Technical University, Kanpur, India
- Delivered a lecture on 'Importance of Agricultural Soil Health' to farmers at Saraighat Peace Foundation, Guwahati on December 29, 2018

- Delivered a talk on ‘Modeling a Circular Gate on a Planar Body TFET: *about the philosophy & not just mathematics!*’ during One Day Indo-Israel Workshop on Nanoelectronic Materials and Devices held at BITS Pilani, Pilani on November 2, 2018
- Delivered a one-day lecture on ‘Tunnel Field Effect Transistors: Overview, Theory and Challenges’ at Girijananda Chowdhury Institute of Management and Technology (GIMT), Guwahati, Assam, India on March 28, 2015.

PROFESSIONAL AFFILIATIONS

- Has been a student member of IEEE (Membership No.: 92618098) since March, 2013
- Has been a member of IEEE Electron Devices Society since March, 2013
- Has been Student Chair, IEEE Electron Devices Society Student Branch Chapter, NIT Silchar for the session January, 2016 – December, 2016.

TECHNICAL SEMINARS AND WORKSHOPS

- Attended 3 Day Workshop on ‘Nanoscience and Nanotechnology’ at National Institute of Technology Silchar, Assam during March 2 – 4, 2017.
- Attended a Short Term Training Programme on ‘Emerging Devices and VLSI Physical Design’ at National Institute of Technology Silchar, Assam during October 25 – 27, 2016.
- Attended a One Week Short Term Training Programme on ‘Microelectronics and VLSI Design’ at National Institute of Technology Silchar, Assam during March 21 – 26, 2016.
- Participated in the Two-Day Workshop on ‘Internet of Things’ at National Institute of Technology Silchar, Assam during October 12 – 13, 2015.
- Attended a one-day talk on ‘Analog and Mixed Signal Design’ at National Institute of Technology Silchar, Assam in December, 2013
- Attended a workshop on ‘Application of Embedded System in Various Fields of Electronics’ at National Institute of Technology Silchar, Assam in September, 2012

CAREER ACHIEVEMENTS

- Was a co-convenor of Symposium on Carbon Nanomaterial Electronics (SCNE) 2019 organized by BITS Pilani in association with Tel Aviv University, Israel during November 8 – 9, 2019.
- Chaired a session at 3rd International Conference on Soft Computing: Theories and Applications held at NIT Jalandhar, India during December, 2018
- Was a Co-convenor for Indo-Israel Workshop on Nanoelectronic Materials and Devices held at BITS Pilani, Pilani on November 2, 2018
- Qualified Graduate Aptitude Test in Engineering (GATE) – 2012 in Electronics & Communication (EC) with a score of 452, AIR: 6868 and percentile: 96.11
- Has reviewed research papers for Microelectronics Journal, Silicon, Indian Journal of Physics, International Journal of Electronics Letters, IET Micro Nano Letters and Applied Physics.
- Represented IEEE ED Student Branch Chapter, NIT Silchar at IEEE Asia ED Chapter Chair Meeting – 2016 at National Institute of Science and Technology, Berhampur, Odisha.

CO-CURRICULAR ACTIVITIES

- Editor of a non-profit international e-magazine, Guwahatian (ISSN: 2395-2547): www.guwahaticity.in aimed at bringing unpublished and budding creative individuals to limelight
- Founder of [Vrixaa Labs](#), an open source educational development application for engineering students.
- Designed an Android application, [Ashish](#), for the support of the elderly in Assamese language.