

Sudip Kundu

Assistant Professor

BIT Mesra, Ranchi– 835215, Jharkhand, INDIA.

Mobile: +91-9433754358

Email: kundu.sudip@gmail.com

Education	PhD Awarded October, 2015 Indian Institute of Technology, Kharagpur, WB Thesis Topic: Design Automation of Analog and Mixed Signal System / Sub-system using Hierarchical Abstraction.	2011-2015
	MS (by Research) in Microelectronics & VLSI Indian Institute of Technology, Kharagpur, WB Thesis Topic: Simulation Based Study of Polarization Induced Band-gap Engineered Gallium Nitride High Electron Mobility Transistor on Silicon Carbide and Sapphire Substrate. CGPA: 9.15	2008-2010
	B.E. in Electronics & Telecommunication Engineering Kalyani Govt. Engineering College, Kalyani, WB Marks Obtained: 83.88 %	1999-2003
	Higher Secondary (H.S.) under WBBCHSE Bandel Vidyamandir, WB Marks Obtained: 79.4 %	1999
	Secondary (Madhyamik) under WBBSE Magra Uttam Chandra High School, WB Marks Obtained: 71.375 %	1997
Job Experience	Assistant Professor NIT Rourkela, Odisha, India.	2020-Present
	Assistant Professor BIT Mesra, Ranchi, Jharkhand, India.	2015-2020
	Senior Project Officer + Senior Research Fellow Sponsored Research and Consultancy (SRIC), IIT Kharagpur, India.	2007-2015
	Scientific Officer-C Bhabha Atomic Research Centre (BARC), Department of Atomic Energy, Govt. of India, Kalpakkam, Tamilnadu, INDIA.	2006-2007
	Trainee Scientific Officer NFC-HWB Training School, affiliated training school of BARC Training school, Govt. of India.	2005-2006
	Lecturer Durgapur Institute of Advanced Technology And Management, Durgapur, West Bengal, India.	2003-2005
Technical Skills	Area of Specialization <ul style="list-style-type: none">– Analog/Mixed-Signal (AMS) system design and exploration of methodologies<ul style="list-style-type: none">▪ Modeling and design automation of analog and digital circuits▪ Combined EDA and Analog design skills▪ Design methodologies for analog electronic system design▪ Deterministic optimization: Non-linear and Geometric programming based optimization	

- MOOP using deterministic and evolutionary optimization algorithm
- Modeling of compound semiconductor devices, Nitride, Arsenide and Phosphide based high electron mobility transistor (HEMT).
- MEMS based energy harvester for medical implanted device

Publications Journals:

1. **Sudip Kundu**, P. Mandal, ISGP: Iterative sequential geometric programming for precise and robust CMOS analog circuit sizing, *INTEGRATION, the VLSI journal*, Elsevier, 2014, Vol. 47, No. 4, pp. 510-531, <http://dx.doi.org/10.1016/j.vlsi.2014.01.001> **(SCI)**
2. **Sudip Kundu**, P. Mandal, An Efficient Method of Pareto-Optimal Front Generation for Analog Circuits, *Analog Integrated Circuits and Signal Processing*, Springer, Vol. 94, No. 2, pp 289–316, February 2018, <https://doi.org/10.1007/s10470-017-1073-5> **(SCI)**
3. **Sudip Kundu**, S. Sarkar, P. Mandal, A. Islam, Modeling and Sizing of Non-linear CMOS Analog Circuits used in Mixed Signal Systems, *Analog Integrated Circuits and Signal Processing*, Springer, Vol. 99, No. 1, pp. 95-109, August-2018, <https://doi.org/10.1007/s10470-018-1310-6>, ISSN: 1573-1979, **(SCI)**.
4. Dipta Chaudhuri, **Sudip Kundu**, Neela Chatteraj, Design and analysis of MEMS based piezoelectric energy harvester for machine monitoring application, *Microsystem Technologies*, Springer, April 2019, Volume 25, Issue 4, pp 1437 - 1446, ISSN: 1432-1858 (Electronic Version), <https://doi.org/10.1007/s00542-018-4156-z> **(SCI)**.
5. Sourav Naval, Prasun Kumar Sinha, Nikhil Kumar Das, Ashutosh Anand, **Sudip Kundu**, Wideband Piezoelectric Energy Harvester design using parallel connection of multiple beams, *International Journal of Nanoparticles*, Inderscience Publishers, August 2019, Volume XX, Issue XX, pp XXX - XXX, E-ISSN: 1753-2515 (Accepted, Issue in progress), **(Scopus)**
6. Ashutosh Anand, **Sudip Kundu**, Design of Spiral shaped Piezoelectric Energy Harvester for powering Pacemakers, *Nanomaterials and Energy*, ICE Publishing, December, 2019, Volume 8 Issue 2, pp. 139-150, <https://doi.org/10.1680/jnaen.19.00016>, ISSN 2045-9831 **(ESCI)**
7. Ashutosh Anand, Sourav Naval, Prasun Kumar Sinha, Nikhil Kumar Das, **Sudip Kundu**, Effects of coupling in piezoelectric multi-beam structure, *Microsystem Technologies*, Springer, April 2020, Vol. 25, No. 4, pp 1235-1252, <https://doi.org/10.1007/s00542-019-04653-3>, ISSN: 1432-1858 (Electronic Version) **(SCI)**.
8. Rashmi Sahu, Maitrayee Konar, Sudip Kundu, Improvement of Gain Accuracy and CMRR of Low Power Instrumentation Amplifier using High Gain Operational Amplifiers, *Micro and Nanosystems*, Bentham, Volume xx, Issue xx, DOI : 10.2174/1876402912666200123153318, E-ISSN: 1876-4037 (Online) (Scopus)
9. Geetanjali Singh, **Sudip Kundu**, An Efficient DC-DC Boost Converter for Thermoelectric Energy Harvesting, *AEU - International Journal of Electronics and Communications*, Elsevier, Volume 118, pp 1 - 10, May 2020, DOI: <https://doi.org/10.1016/j.aeue.2020.153132>, ISSN: 1434-8411, **(SCI)**

International Conference:

1. Sourav Naval, Prasun Kumar Sinha, Prasun Kumar Sinha, Ashutosh Anand, Sudip Kundu, Bandwidth Increment of Piezoelectric Energy Harvester using Multi-beam Structure, 3rd International Conference on Devices for Integrated Circuit (DevIC), Kalyani, India, 23rd-24th, April, 2019, Electronic ISBN: 978-1-5386-6722-4, pp 370-373, IEEE Xplore Digital Library, DOI: 10.1109/DEVIC.2019.8783724
 2. Ashutosh Anand, Sudip Kundu, Improvement of Output Power in Piezoelectric Energy Harvester under Magnetic Influence, 3rd International Conference on Devices for Integrated Circuit (DevIC), Kalyani, India, 23rd-24th, April, 2019, Electronic ISBN: 978-1-5386-6722-4, pp 382-383,
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3. Ashutosh Anand, Sudip Kundu, Design of Mems Based Piezoelectric Energy Harvester for Pacemaker, 3rd International Conference on Devices for Integrated Circuit (DevIC), Kalyani, India, 23rd-24th, Aprli, 2019, Electronic ISBN: 978-1-5386-6722-4, pp 465-469, IEEE Xplore Digital Library, DOI: 10.1109/DEVIC.2019.8783311
 4. Aashita Raj, Sai Yaswanth Divvela, Geetanjali Singh, Sudip Kundu, Trade-off Characteristics of Hysteresis Comparator used in Noisy Systems, 3rd International Conference on Devices for Integrated Circuit (DevIC), Kalyani, India, 23rd-24th, Aprli, 2019, Electronic ISBN: 978-1-5386-6722-4, pp 413-417, IEEE Xplore Digital Library, DOI: 10.1109/DEVIC.2019.8783668
 5. Maitraiye Konar, Rashmi Sahu, Sudip Kundu, Improvement of the Gain Accuracy of the Instrumentation Amplifier Using a Very High Gain Operational Amplifier, 3rd International Conference on Devices for Integrated Circuit (DevIC), Kalyani, India, 23rd-24th, Aprli, 2019, Electronic ISBN: 978-1-5386-6722-4, pp 408-412, IEEE Xplore Digital Library, DOI: 10.1109/DEVIC.2019.8783414
 6. Namrata Mendiratta, Geetanjali Singh, Neela Chattaraj, Sudip Kundu, Optimization of Capacitor for Piezoelectric Energy Harvesting, IEEE Power Electronics, Drives and Energy Systems Conference (PEDES 2018), at Indian Institute of Technology Madras in Chennai, Tamilnadu, India, 18-21 December, 2018, Electronic ISBN: 978-1-5386-9316-2, DOI: 10.1109/PEDES.2018.8707531 (Presented)
 7. Surbhi Sinha, Aditya Gullapalli, Vinayak, Sherin Suzana John, Sudip Kundu, DC DC Boost Converter for Thermoelectric Energy Harvesting, International Conference on Current Trends towards Converging Technologies (IEEE ICCTCT 2018), Coimbatore, Tamil Nadu, India during 1-3 March, 2018.
 8. Dipta Chaudhuri, S. Kundu and Neela Chatteraj, Energy Harvester for Medical Implanted Devices, ISSS International Conference on Smart Materials Structures & Systems (ISSS 2017), IISc., Bangalore, 5-7th July, 2017
 9. Jyoti Sharma, Mohd. Samar Ansari and Sudip Kundu, Tunable Universal Filter in $\pm 0.5V$ 32nm CNFET for ISM 2.4 GHz Bluetooth/Zigbee Transceivers, International Conference on Intelligent Communication, Control and Devices 2017, (Accepted for publish in Book Series of Springer-Advances in Intelligent Systems & Computing (AISC)), 15th & 16th April 2017
 10. Dipta Chaudhuri, S. Kundu and Neela Chatteraj, Harvesting Energy with Zinc Oxide Biocompatible Piezoelectric material for powering of Cochlear Implants, International Conference on Innovations in Power and Advanced Computing Technologies (i-PACT 2017), IEEE Conference, VIT, Tamil Nadu, India, 21 & 22 April 2017
 11. Dipta Chaudhuri and S. Kundu, MEMS Piezoelectric Energy Harvester to power Wireless Sensor Nodes for Machine Monitoring application, International Conference on Devices for Integrated Circuit (DevIC 2017), IEEE Conferenc, Kalyani, West Bengal, India, March 23-24, 2017
 12. Subrangshu Chatterjee, Anumita Sengupta S. Kundu, Aminul Islam, Analysis of AlGaIn/GaN High Electron Mobility Transistor for High Frequency Application, International Conference on Devices for Integrated Circuit (DevIC 2017), IEEE Conferenc, Kalyani, West Bengal, India, March 23-24, 2017
 13. S. Kundu, P. Mandal, Design Automation of Analog Module using Hierarchical Decomposition, IEEE Students' Technology Symposium (IEEE TechSym 2016), IIT Kharagpur, India, 2016
 14. M. Guduri, S. Kundu, and Aminul Islam, "Investigation on Electrical Characteristics of FDSOI Device for Ultra-Low Power Operation", International Conference on Recent Advances In Information Technology (IEEE), ISM Dhanbad, 2016
 15. S. Kundu, P. Mandal, A Generic and Efficient Modeling of Phase Margin of High Performance CMOS OpAmps, IEEE Students' Technology Symposium (IEEE TechSym 2014), IIT Kharagpur, India, 2014
 16. S. Kundu, P. Das, S. Pathak, P. Mukhopadhyay, J. Reddy, Edward Y. Chang and D. Biswas, "Reduction of Negative Differential Conductivity Effect of AlGaIn/GaN HEMTs using Gate Scaling", 10th IEEE Conference on Nanotechnology (IEEE-NANO), 2010Kintext, Seoul, Korea, 17th-20th August 2010.
 17. P. Mukhopadhyay, S. Kundu, P. Das, S. Pathak, E.Y. Chang and D. Biswas; "W-band Penta-Composite Channel InAlAs/InGaAs Metamorphic HEMT for High Power Application and Comparison with Pseudomorphic HEMT" at 2010 International Conference On Compound Semiconductor Manufacturing Technology (CS ManTech), May 2010 Marriott – Waterfront, Portland, Oregon, USA.
 18. S. Kundu, P. Das, S. Pathak, P. Mukhopadhyay, J. Reddy, Edward Y. Chang and D. Biswas, "Simulation of AlGaIn/GaN HEMT on 4H-SiC substrate including self-heating effect for high power
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amplifier at Ka band applications,” International Conference on Nano Science and Technology 2010, Bombay.

19. S. Kundu, P. Das, S. Pathak, P. Mukhopadhyay, J. Reddy, Edward Y. Chang and D. Biswas, “Optimized Bandgap Engineered AlGa_N/Ga_N HEMT for High Power Amplifier at Ku Band Applications”; International Workshop on the Physics of Semiconductor Devices 2009, Delhi.

20. P. Das, S. Kundu, J. Reddy, S. Pathak, P. Mukhopadhyay, Edward Y. Chang and D. Biswas, “Novel Ideation of Phosphor free InGa_N/Ga_N Multiple Quantum Well based white LED ,” International Workshop on the Physics of Semiconductor Devices 2009, Delhi.

21. P. Mukhopadhyay, S. Kundu, Harikrishnan A.I, P. Das, S. Pathak, E.Y. Chang and D. Biswas; “Five Channel InAlAs/InGaAs MHEMT for High Frequency Power Amplifier Application and Comparison over Conventional PHEMT”; IEEE-NANO 2009, 9th IEEE Conference on Nanotechnology, July 26-30th 2009, Genoa, Italy.

22. P. Mukhopadhyay, P. Das, S. Pathak, S. Kundu, E.Y. Chang, D. Biswas; “A Strategic Review of Recent Progress in Metamorphic Quantum Well Based Heterostructure Electronic Devices”; IEEE-NANO 2008 (8th IEEE Conference on Nanotechnology), August 18-21’ 2008, Arlington, Texas, USA P. Das,

23. P. Das, S. Kundu, S. Pathak, P. Mukhopadhyay, R. Anthony, E. Chang, D. Biswas, “Strategic Review of Gallium Nitride Growth on Silicon with Heteroepitaxial Nucleation and Substrate Orientation Technique”; ICPS’08 (International Conference on Physics on Semiconductor), Rio de Janeiro, Brazil, July 27th – 1st August 2008.

24. P. Mukhopadhyay, P. Das, S. Pathak, S. Kundu, E. Chang, D. Biswas “Recent Advances and Strategic Directions in Metamorphic Heterostructure Transistors” ICPS’08 (International Conference on Physics on Semiconductor), Rio de Janeiro, Brazil, July 27th – 1st August 2008

25. A. Mallik, S. Kundu, S. Saha, R. Saha, A. K. Pal, “Simulation of Capacitor less 1-TDRAM Using PD (Partially Depleted) SOIMOSFET”, in the International Conference on Communications, Devices and Intelligent Systems (CODIS)-2004, Calcutta, India.

National Conference:

1. P. Das, **S. Kundu**, S. Pathak, P. Mukhopadhyay, Harikrishnan A.I., Edward Y. Chang and D. Biswas, “Optimization of Bandgap Engineered AlGa_N / Ga_N HEMT for High Power RF Amplifier Application” at National Conference on Recent Advances in Communication Technology (NCRACT), January 30th – February 1st 2009, Rourkela, India.

2. S. Pathak, P. Mukhopadhyay, Harikrishnan A.I, P. Das, **S. Kundu**, Edward Y. Chang and D. Biswas, “Strategic Review and Comparison of AlGaAs / GaAs HBT and InP / InGaAs HBT for higher frequency devices” at National Conference on Recent Advances in Communication Technology (NCRACT), January 30th–February 1st 2009, Rourkela, India.

Invited Talk	“Simulation Based Comprehensive Model Generation of Bandgap Engineered Gallium Nitride (Ga _N) High Electron Mobility Transistor (HEMT) on Silicon Carbide and Sapphire Substrates” at Gallium Arsenide Enabling Technology Centre GAETEC), Govt. of India, Hyderabad, India, January, 2014.
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Research Project	As PI:
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| 1. | Sponsoring Agency: BIT Mesra
Title of the Project: MEMS based piezoelectric energy harvester for pacemaker
Period: 1 yr
Amount: 80,000 INR
Completed / ongoing: Completed |
| 2. | Sponsoring Agency: Science and Engineering Research Board (SERB), Govt. of India
Title of the Project: MEMS based piezoelectric energy harvester for implanted medical devices.
Period: 3 yrs.
Amount: 38,86,020 INR
Completed / ongoing: Completed |
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AS Co-PI:

1. Sponsoring Agency: DRDO, Govt. of India
Title of the Project: Study of HEMT and its performance in amplifier circuit.
Period: 3 yrs.
Amount: 23,74,200 INR
Completed / ongoing: Ongoing
2. Co-PI of the project: Project Name: Electrical and magnetotransport studies of nano-devices of few/mono-layer transition metal dichalcogenides
Duration: 1 year
Funding agency: National Project Implementation Unit (NPIU)
Scheme: TEQIP Collaborative Research Scheme
Cost: 14.42 Lakh

Awards / Honors

- Homi Bhabha Prize winner in Inst (ECE) Engg. (2006) In NFC-HWB Training School affiliated training school of BARC.
- Best paper presentation award for the paper entitled “A Generic and Efficient Modeling of Phase Margin of High Performance CMOS OpAmps” in the session VLSI Architecture in Techsym2014, IEEE Students’ Technology Symposium, IIT Kharagpur, February 2014.
- Best poster award for the paper entitled “Design Automation of Analog Module using Hierarchical Decomposition” in the Poster Session 2 in Techsym2016, IEEE Students’ Technology Symposium, IIT Kharagpur, September 2016.
- Gate score (2005): 463, 96.64 percentile (Rank 1234)

Extra-Curricular Activities**Volunteer Work**

- Active member in a six days quality improvement program (QIP) on “Overview of III-V Compound Semiconductor Device Technology” sponsored by All India Council for Technical Education (AICTE) (23rd Feb to 28th Feb 2009).
 - I was one of the student volunteers of the conference, ICVSP 2014 held at E&ECE Dept., IIT Kharagpur.
 - Active member and speaker in a ten days short term course sponsored by SAC, ISRO, Ahmedabad, on “CMOS Analog Design” organized at IIT Kharagpur for ISRO scientists (18th Dec to 27th Dec, 2014).
 - Assistant Warden, Hostel-5, Birla Institute of Technology, Mesra (July, 2017-June, 2019)
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