

## Vipan Kakkar

### (Brief Bio)



Name: **Dr. Vipan Kakkar** (Professor)  
Department: Electronics & Communication Engineering  
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**Expertise:** VLSI, System-on-Chip Design, Low-power Biosensors, Biomedical Devices, Microgrid

### 1. Brief Profile Summary:

**Education:** Received Bachelor's in electronics engineering from Nagpur University, India; Master's from Bradford University, UK, in 1997, and doctorate from Delft University of Technology, the Netherlands in 2002.

**Work Experience:** Worked at Phillips, the Netherlands and India, in different capacities as R&D engineer and system architect in various System-on-Chip multinational projects and products for 8 years having recognized specialization in low power design techniques; total experience of more than 22 years including R&D and teaching.

**Current:** Since 2009, has been Professor (**16400-20000**) with the Department of Electronics and Communication Engineering, Shri Mata Vaishno Devi University, Katra, India. Research interests include VLSI System Design, NEMS/MEMS, ultra low-power bioelectronic system and implants design.

*The Vice Chancellor invited him as senior faculty at Shri Mata Vaishno Devi University in 2009 to further the academic development with outreach. Was the seniormost faculty in engineering in Jammu province at the time of joining in 2009.*

Since 2011, a Senior Member of the IEEE, Life Member of the ISTE, Life Member of the VLSI Society of India, and has served as an Executive Council Member of IEEE, Delhi, India,

**New courses:** Developed, founded and started PG (Masters) and doctoral programmes in Electronics & Communication Engineering, in 2010/11 being the only doctorate in engineering at that time;

**(Visiting Faculty and collaboration):** invited for collaboration, lectures and interactions in industry, institutes in India, Europe, USA and Singapore. Has collaborated with international institutes for research, collaborated with Fontys University, Netherlands for Dual B.Tech degree in Electronics Engineering; Project Evaluator for Swiss National Science Foundation.

**Research Publications and guidance:** Has more than 100 publications in peer-reviewed journals, international conferences, technical reports, books/book chapters; one patent published, 3 patents filed; supervised engineers and interns in industry; guided several doctoral and masters students, and utilized the funds for sponsoring the research scholars for internship/conferences.

**Consultancy:** Provided consultancy on Electric Vehicles and submitted to Shri Mata Vaishno Devi Shrine, Katra in 2010. Provided consultancy to Shri Mata Vaishno Devi Shrine Board for CCTV at Bhawan area and other activities in 2010/11, Consultancy given on LED pole lighting for Philips Lighting 2017.

### 2. Courses Taught (general overview):

1. **B.Tech courses:** VLSI Design, Integrated Circuits, Embedded Systems, Electronic Devices & Circuits, Electrical Circuit Theory, Signal Processing, Control System Theory, Consumer Electronics
2. **Masters Courses:** CMOS VLSI, Biomedical Devices, Integrated Circuits, Mixed Signal Testing, Signal Processing Techniques, VLSI Design & Synthesis (Delft University, Netherlands), Low Power VLSI (Netherlands)

### 3. Academic Research Projects:

1. (2010-11) Funded by DST, UGC, "Establishment of VLSI/MEMS R&D Facilities" (completed)
2. (2012-15) Funded by UGC, "Development of Microbial Fuel Cell" (completed)
3. (2016-17) collaboration with Singapore University of Technology and Design, "An audio content based semantic music search system" (completed)
4. (2019-2022) Funded by TEQIP-III, "Study of Fault Tolerant Quantum Dot Cellular Automata Circuits for Ultra Low Power Applications" in collaboration with Baba Ghulam Shah Badshah University (completed)
5. (2019-halted) collaboration with University of California, Irvine, "Alternative/Herbal Medicine and diagnostic Methods"

### 4. Industry R&D Projects (Netherlands/India):

1. (2006-07) System-on-Chip (SoC) architecture for Energy Metering Applications
  - *Chief Architect: Developed Business Creation concept and Created chip architecture that features Low Power SoCs, SoC for Smart E-Metering*

2. (2004-06) System-on-Chip (SoC) for Mobile Multimedia (Audio/Video) Applications
  - *Technical Lead/Senior R&D Engineer: Power aware co-design and test architecture for multimedia SoCs, Adaptive Low power design for Complex mobile multimedia*
3. (2003-04) System-on-Chip (SoC) for Automotive Entertainment (ARM processor based Car radio/stereo)
  - *Senior R&D/SoC integration Architect: DSP-system for audio applications, Audio Processor for Car music system–Datasheet*
4. (2003-04) System-on-Chip (SoC) low-power design for Hearing Aid
  - *R&D Engineer: Low power Soc design*
5. (2002-03) System-on-Chip (SoC) functional verification for TV Applications (till 2002/3)
  - *R&D Engineer: Soc design and integration, technology transfer for wafer testing to far-east*

## 5. Consultancy:

1. (2010-11) Electric Vehicles study submitted to Shri Mata Vaishno Devi Shrine (**Completed**)
2. (2011) Surveillance/CCTV plan for the shrine/bhawan area, Shri Mata Vaishno Devi Shrine Board (**Completed**)
3. (2016) Solar Lighting Solution at Low Temperature, Philips India. (**Completed**)

## 6. Other Academic Achievements:

### a. Awards/Honors:

- i. Dutch Research Fellowship
- ii. Recognition for low power SoC techniques at Philips Netherlands;
- iii. Dr. APJ Abdul Kalam Teachers' Excellence Award, 2020, Shikshak Kalyan Foundation, Courtesy: AICTE
- iv. Tribute by students on Teacher's day, 2020 in "Daily Jammu Rising" and "The News Now", Jammu newspapers.
- v. Lectures and discussions in Industry and academia in Germany, Netherlands, France, Austria, UK.

**b. Countries worked-in & Countries visited:** Netherlands, UK, USA, Austria, Germany, France, other Schengen Countries.

### c. New programmes / Labs developed:

- i. (2010-12) Co-coordinator for special package for J&K Universities with funds from DST
- ii. (2010-11) Academic collaboration with Fontys University, Netherlands
- iii. (2010-11) Proposed, planned and co-ordinated the first PG-programme (M.Tech in Electronics & Communication Engineering) with all lab setups
- iv. (2010-11) VLSI/MEMS/Microsystems Lab with funds from UGC, DST

### d. Academic Community Support:

- i. Has served as member Executive-Council IEEE, India 2013-14, and as member of few national and international committees in related fields. Also served as a member of Editorial Boards of few national and international journals and Lead Guest Editor for Nanomaterials and Nanotechnology (SAGE Publ, UK), for topic on Lab-on-Chip Devices in 2018, and Biomedical Informatics Insights (Sage Publ, UK).
- ii. Visiting Faculty: University of California, Irvine, Singapore University of Technology & Design
- iii. Lectures in industry and academia in Germany, Netherlands, France, Austria, UK.
- iv. Reviewer of Biomedical Engineering online, IET electronic letters, IEEE Transactions on Industrial Electronics, IEEE Access, IET Image Processing

**e. Professional Affiliation:** Senior Member of IEEE, Life Member of ISTE and VLSI Society of India. Thesis Reviewer at University of Jammu, and University of Kashmir.

## 7. Research / PhD Guidance:

### a. Doctoral theses (7 phd guided):

- i. Dr. Amit Kant Pandit (awarded 2010/11) - Currently working as Associate Professor, Shri Mata Vaishno Devi University
- ii. Dr. Manish Sabraj (awarded 2013) - Currently working as Associate Professor, Shri Mata Vaishno Devi University
- iii. Dr. Suhaib Ahmed Batt (awarded 2019) – Currently working as Assistant Professor, Baba Ghulam Shah Badshah University, Rajouri
- iv. Dr. Vikram Gupta (awarded 2021) – Currently working as Technical Assistant, Shri Mata Vaishno Devi University
- v. Dr. Shagun Gupta (awarded 2021) working on "On-chip Tuberculosis Diagnostics"

- vi. Mr. Neeraj Tripathi (submitted in Feb. 2019) – Currently working as Assistant Professor, Shri Mata Viashno Devi University
- vii. Mr. Rakesh Sharma (part-time 2015-present), Executive Engineer (PDD), working on “Short Term Load Forecasting in J&K power sector” in progress

**b. PG/Masters theses:**

23 MTech (Masters) theses guided

**8. Other Academic Activities:**

**a. External Examiner/Expert**

- i. Examiner for MPhil theses since 2010 at Department of Electronic Science, University of Jammu
- ii. Examiner MSc dissertation since 2011 at Department of Electronic Science, University of Jammu
- iii. External Expert in selection committee at University of Jammu
- iv. Co-coordinator for SMVDU to the DST Pilot Package Programme for universities of J&K
- v. Project Evaluator for Swiss National Science Foundation, Switzerland

**b. Keynote Speech/Expert Lectures**

- i. (2001-2008) Several technical talks delivered in Netherlands, Germany and India.
- ii. (2009) Visit and Discussion for research-work and lecture on Biomedical Electronic Systems at Ghent University, Belgium, Dec 2009.
- iii. (2009) Lecture on Low Power Design Techniques at NXP Netherlands, Dec 2009.
- iv. (2009) Discussion on System on Chip design projects at NXP Bengaluru, Nov. 2009.
- v. (2012) Expert Lecture on VLSI Techniques in Wireless Sensor Networks at UGC Sponsored National Seminar on Wireless Communication & Networks, March 2012
- vi. (2012) Invited Lectures in VLSI Development for SoC, Electronic Science, University of Pune, Nov. 2012.
- vii. (2016) Keynote speech on Ultra Low Power Implantable Devices UGC sponsored National Seminar on Electronic Devices, Systems and Information Security, University of Kashmir, 18-19 March 2016.
- viii. (2017) Expert Lecture on “Tips for writing good research paper at”2-week refresher course on “Research Methodology”, Shri Mata Vaishno Devi University, 27 Mar. 2017.
- ix. (2017) Keynote speech on Implantable Medical Devices at National Conference on Emerging Trends and Innovations in Electronics and Communication Engineering, Baba Ghulam Shah Badshah University, Rajouri, Aug. 26-27, 2017.
- x. Invited lecture on Ultra Low Power Biosensors: VLSI Trends And Future Scope, Biomedical Conference, Osaka, Japan, Oct. 16-17, 2017.
- xi. (2017) Invited as Keynote speaker on Implantable Medical Devices: Technologies, Trends And Future Scope, 3rd Intl Symp. On New and Advanced Materials and Technologies for Energy, Environment and Sustainable Development, Mexico, Oct. 22-26, 2017
- xii. (2019) Keynote speech on Intellectual Property Rights at Baba Ghulam Shah Badshah University, Rajouri, Jan. 25, 2019
- xiii. (2019) Lecture Series on Specialised Linear Integrated Circuits, Department of Electronic Science, University of Jammu, March 5-7, 2019.
- xiv. (2019) Expert Lecture on QCA and Nanotechnology at Baba Ghulam Shah Badshah University, Rajouri, Dec. 2019

**c. Conference/Workshop/Session Chair**

- i. (2011) Chairman, IEEE International Conference on “Communication Systems and Network Technology”, CSNT-2011
- ii. (2012) Chairman, UGC Sponsored National Seminar on Wireless Communication & Networks, 24<sup>th</sup> March 2012.
- iii. (2016) Session chair at UGC sponsored National Seminar on Electronic Devices, Systems and Information Security, University of Kashmir, 18-19 March 2016.
- iv. (2016) General Chair and session chair, 3rd International Conference on Recent Trends and Advancements in Engg. & Tech. SMVDU, 17-18 Nov. 2016.
- v. (2016) Session Chair, National Conference and Exhibition on “Emerging and Innovative Trends in Engineering Technology” (NCEEITET-16), GCET, Jammu, Nov. 10-11, 2016.
- vi. (2016) General Chair, UGC sponsored Two-day Workshop On Ultra Low-Power Biosensors and Implantable Microsystems, at SMVDU, 2-3 Dec. 2016
- vii. (2017) General Chair, UGC sponsored Two-day Workshop On Numerical Analysis in VLSI CAD using MATLAB and SIMULINK, at SMVDU, 14-15 Jan. 2017
- viii. (2017) General Chair, Workshop on Scientific Writing using Latex, at SMVDU, 24<sup>th</sup> Feb. 2017

- ix. (2017) Session Chair on 27<sup>th</sup> Aug. at National Conference on Emerging Trends and Innovations in Electronics and Communication Engineering, Baba Ghulam Shah Badshah University, Rajouri, Aug. 27, 2017.

#### **9. Administrative Positions/Member Committees (2009-12):**

- i. (2004-08) Chip Architect, Technical Lead, NXP/Philips
- ii. (2009-15) Member of the University/College Research Committee
- iii. (2009-12) Member of Selection Committees (teaching & non-teaching)
- iv. (2010-12) Member of Academic Council
- v. (2010-12) Member of Executive Council
- vi. (2009-12) Coordinator, SMVDU-Quality Assurance Cell
- vii. (2010-11) Member of the committee to laydown PhD ordinances
- viii. (2012- ) Technical Expert in Library Purchase Committee
- ix. (2011-12) Member BoS, School of Computer Science Engineering
- x. (2010-12) School (ECE) Technical Committee
- xi. (2010-12) School (ECE) Purchase Committee
- xii. (2010-12) Director/HoD of School of Electronics & Communication Engineering
- xiii. (2011-12) Dean of Student Welfare

#### **10. Publications:**

##### **a. No. of Research/Industry Papers**

- Around 45 SCI/Scopus indexed publications
- 25 papers in UGC approved publications
- several conference papers
- 10 technical reports on industrial projects
- 3 technical/consultancy reports

##### **b. List of Research Papers: (Indexed in SCI/Scopus/UGC)**

1. Soha M Bhat, Suhaib Ahmed, Vipin Kakkar, "Design of SSG-1 gate-based cost-efficient reversible digital circuits using quantum-dot cellular automata technology", International Journal of Numerical Modeling, Electronic Networks, Devices and Fields, July 2022 (SCI)
2. Soha M Bhat, Suhaib Ahmed, Vipin Kakkar, "Quantum dot Cellular Automata based Design of 4x4 TKG Gate and Multiplier with Energy Dissipation Analysis", Lecture Notes in Electrical Engineering, Springer, April 2022 (Scopus)
3. Neeraj Tripathi, Vipin Kakkar, "Low Power Electrode Interface for Implantable Medical Devices", Neuroquantology, Vol. 20, No.6, June 2022 (scopus)
4. Vikram Kumar, Vipin Kakkar, Krishan Kumar, Vinaya Rana" Hybrid Power Modulation Scheme for High Frequency Isolated Bidirectional Dual-Active-Bridge DC-DC Converter" in Special issue on Advance Innovation and Technology with Sustainability Engineering in International Journal of Social Ecology and Sustainable Development, Vol. 13, No. 2, 2022 (scopus)
5. Neeraj Tripathi, Vipin Kakkar, "Electrical Modelling of Neuron System for Deep Brain Stimulation Microelectrode", Turkish Online Journal of Qualitative Inquiry, Vol. 12, No.7, July 2021 (scopus)
6. Shagun Gupta, Vipin Kakkar, Suhaib Ahmed, Farooq Khanday, Sparsh Sharma, Saurabh Singh, Byungun Yoon "Modelling of On-Chip Biosensor for the in vivo Diagnosis of Hypertension in Wireless Body Area Networks", IEEE Access, Vol. 10, August 2021 (SCI)
7. Shagun Gupta, Vipin Kakkar, "Point-of-Care Detection of Tuberculosis using Magnetoresistive Biosensing Chip", Tuberculosis, Vol. 127, Feb. 2021 (SCI)
8. Vikram Kumar, Vipin Kakkar, "Efficient Resonant Frequency Power Modulation Technique for High Frequency Isolated Dual Active Bridge Converter", Journal of Huazhong University of Science and Technology, Vol 50, No. 4, April 2021
9. Neeraj Tripathi, Vipin Kakkar, "Low Power Electrode Interface for Implantable Medical Devices", Journal of Huazhong University of Science and Technology, Vol 50, No. 4, April 2021
10. Tanveer Ahmed Rather, Suhaib Ahmed, Vipin Kakkar, "Modelling and Simulation of a Reversible Quantum Logic based 4x4 Multiplier Design for Nanotechnology Applications", International Journal of Theoretical Physics, doi: 10.1007/s10773-019-04285-3, Nov. 2019 (SCI)
11. Shagun Gupta, Vipin Kakkar, Indu Bhushan Sharma, "Crosstalk between Vaginal Microbiome and Female Health: A review", Microbial Pathogenesis, Vol. 136, 2019 (SCI)
12. Shagun Gupta, Vipin Kakkar, "DARPin based GMR biosensor for the detection of ESAT-6 tuberculosis protein", Tuberculosis, Vol. 118, 2019 (SCI)

13. Firdous Ahmed, Suhaib Ahmed, Vipin Kakkar, G.M. Bhat, Ali Newaz Bahar, Shah Jahan Wani, "Modular Design of "Ultra-Efficient Reversible Full Adder-Subtractor in QCA with Power Dissipation Analysis", International Journal of Theoretical Physics, Vol. 57, No. 9, pp 2863-2880, Sept. 2018 (SCI)
14. Shagun Gupta, Vipin Kakkar, "Recent Technological Advancements in Tuberculosis Diagnostics- A Review", Biosensors & Bioelectronics, Vol 115, No. , pg 14-29, May 2018. (SCI)
15. Suhaib Ahmed, Vipin Kakkar, "A Novel Angular SiO<sub>2</sub> Electret-based Electrostatic Energy Harvester for Cardiac and Neural Implants", Biomedical Research, (29(8):1523-1526, May, 2018). (SCI)
16. Bisma Bilal, Suhaib Ahmed, Vipin Kakkar, "Modular Adder Designs using Optimal Reversible and Fault Tolerant Gates in Field-Coupled QCA Nanocomputing," International Journal of Theoretical Physics, Vol. 57, No. 5, pg. 1356-75, Feb. 2018. (SCI)
17. Vipin Kakkar, An Ultra Low Power System Architecture for Implantable Medical Devices, IEEE Access, Vol. 7, 111160-111167, Feb. 2018 (SCI)
18. Suhaib Ahmed, Vipin Kakkar, "Modeling and Simulation of an eight-bit auto-configurable successive approximation register analog-to-digital converter for cardiac and neural implants," Simulation: Transactions of the Society for Modeling and Simulation International, Vol. 94, No. 1 Jan 2018, pg 11-29. (SCI)
19. Suhaib Ahmed, Vipin Kakkar, "An Electret-Based Angular Electrostatic Energy Harvester for Battery-Less Cardiac and Neural Implants", IEEE Access, Vol. 5, July 2017, pg. 19631 – 43. (SCI)
20. Vikram Kumar, Vipin Kakkar, Miniaturized Resonant Power Conversion for Implanted Medical Devices, IEEE Access, Vol. 5, July 2017, pg. 15859 – 64. (SCI)
21. Vipin Kakkar, "Performance Analysis of Nanometer CMOS for Mixed Signal Circuits", Journal of Circuits, Systems and Computers, World Scientific Publishing, Vol. 20, No. 6, 2011. (SCI)
22. Sanna Mairaj, Suhaib Ahmed, Vipin Kakkar, "A Survey on Emerging Technologies and Architectures of Low Power Preamplifiers for Biomedical Applications," International Journal of Nanoelectronics and Materials, Vol. 11, (1), Feb. 2018 (Scopus)
23. Sanna Mairaj, Suhaib Ahmed, Vipin Kakkar, "An Optimized Low-Noise Low-Power Preamplifier for Cardiac Implants," International Journal of Nanoelectronics and Materials, Vol. 11, No. (1), Feb. 2018. (Scopus)
24. Neeraj Tripathi, Vipin Kakkar, "Deep Brain Stimulation: Applications and Challenges", International Journal on Future Revolution in Computer Science & Communication Engineering, Vol. 4, No. 2, Feb. 2018.
25. Suhaib Ahmed, Sakshi Koul, Vipin Kakkar, "Modelling of Silicon Based Electrostatic Energy Harvester for Cardiac Implants," International Journal of Nanoelectronics and Materials, Vol. 11, No. 1, Jan. 2018, pg 77-86. (Scopus)
26. Bisma Bilal, Suhaib Ahmed, Vipin Kakkar, "Quantum Dot Cellular Automata: A New Paradigm for Digital Design," International Journal of Nanoelectronics and Materials, Vol. 11, No. 1, Jan. 2018, pg 87-98. (Scopus)
27. Rohit Kumar, Sujeet Kumar Pathak, Vipin Kakkar, "Solar Powered Robotic Motor Vehicle" International Journal of Emerging Technologies in Engineering Research, Vol. 4, May 2018.
28. Bisma Bilal, Suhaib Ahmed, Vipin Kakkar, "Optimal Realization of Universality of Peres Gate using Explicit Interaction of Cells in Quantum Dot Cellular Automata Nanotechnology," International Journal of Intelligent Systems and Applications vol. 9, no.6, Jul 2017, pp. 75-84 (Scopus)
29. Furqan Zahoor, Swastik Gupta, Vipin Kakkar, "A Comparative Study of High Efficiency DC/DC Boost Converters for Medium Power Applications", International Journal of Emerging Technologies in Engineering Research, Vol. 5, Oct. 2017. (Scopus)
30. Furqan Zahoor, Swastik Gupta, Vipin Kakkar, "High Efficiency DC/DC Boost Converters for Medium/High Power Applications", International Journal of Hybrid Information Technology, Vol. 9, No. 11, 2016. (Scopus)
31. Bisma Bilal, Suhaib Ahmed, Vipin Kakkar, "An Insight into Beyond CMOS Next Generation Computing using Quantum-dot Cellular Automata Nanotechnology," International Journal of Engineering and Manufacturing, vol. 8, no. 1, Jan. 2018, pp. 25-37. (Scopus)
32. Furqan Zahoor, Swastik Gupta, Vipin Kakkar, "A Comparative Study of High Efficiency DC/DC Boost Converters for Medium Power Applications", International Journal of Emerging Technologies in Engineering Research, Vol. 5, Oct. 2017.
33. Bisma Bilal, Suhaib Ahmed, Vipin Kakkar, "QCA Based Efficient Toffoli Gate Design and Implemented for Nanotechnology Applications", International Journal of Engineering and Technology, Vol. 9 (3S), July, 2017. (Scopus)
34. Suhaib Ahmed, Saima Bashir, Bisma Bilal, Vipin Kakkar, "Feasibility of Successive Approximation Register ADC in Ultra Low Power Biomedical Applications", International Journal of Engineering and Technology, Vol. 9 (3S), July, 2017. (Scopus)
35. Suhaib Ahmed, Lubna Aslam, Bisma Bilal, Samiya Ali, Vipin Kakkar, "Investigation on Applicability and Suitability of Microcantilever based Biosensing for DNA Detection," Advances in Biotechnology and Microbiology, vol. 2, no. 4, pp. 555593, 2017.

36. Shagun Gupta, Kritika Ramesh, Vipin Kakkar, "Lab-on-Chip Technology: A Review on Design Trends and Future Scope in Biomedical Applications" International Journal of Bio-Science and Bio-Technology, vol. 8, no. 5, pp. 311-322, 2016. (Scopus)
37. Kritika Ramesh, Shagun Gupta, Suhaib Ahmed, Vipin Kakkar, "A Comparative Study on Design Trends and Future Scope of Implantable Drug Delivery Systems" International Journal of Bio-Science and Bio-Technology, vol. 8, no. 6, pp. 512, 2016. (Scopus)
38. Baseerat Khan, Suhaib Ahmed, Vipin Kakkar, "A Comparative Analysis of Thermal Flow Sensing in Biomedical Applications," International Journal of Biomedical Engineering and Sciences, vol. 3, no. 3, pp. 1-7, 2016.
39. Saima Bashir, Suhaib Ahmed, Vipin Kakkar, "Design and Performance Trends of Low Power Sigma Delta A/D Converters," Journal of VLSI Design Tools and Technology, vol. 6, no. 2, pp. 5-12, 2016.
40. Sakshi Koul, Suhaib Ahmed, Vipin Kakkar, "An Enhanced Pre-Amplifier for Cochlear Implants," ACTA Technica Napocensis, Electronics and Communication, vol. 56, no. 4, pp. 13-17, 2015.
41. Vipin Kakkar, "Improved Spatial Scalability for Video Compression", ACTA Napocensis Electronica Vol. 53, No. 1, 2012.
42. Manish Sabraj, Vipin Kakkar, " Performance Analysis of Upsample Filter for Sample Rate Converter", Signal & Image Processing: An International Journal, Vol. 3, No. 1, 2012.
43. Anurag Shrivastava, Vipin Kakkar et al, "Trends and Trade-offs in Designing and Performance Evaluation of Different On-Chip AMBA Bus", International Journal of Engineering Sciences & Management, Jan-Mar, 2012.
44. Anurag Shrivastava, Vipin Kakkar et al, "Low-Power Issues On-Chip AMBA Bus", International Journal of Engineering Sciences & Management, Jan-Mar, 2012.
45. Vipin Kakkar, A. Sharma, "Fingerprint Image Enhancement using Wavelet Transform and Gabor Filtering", ACTA Napocensis Electronica, Vol. 52, No. 4, 2011.
46. Vipin Kakkar, "Feasibility of Low Energy Devices and Applications", ACTA Napocensis Electronica, Vol. 52, No. 3, 2011.
47. Vipin Kakkar, "Performance Analysis of Nanometer CMOS for Mixed Signal Circuits", Journal of Circuits, Systems and Computers, World Scientific Publishing, Vol. 20, No. 6, 2011 (SCI).
48. Manish Sabraj, Vipin Kakkar, " Performance Analysis of Sample Rate Converter with variation of conversion factor", International Journal of Electronics Engineering Research, Volume 3 Number 2, July, 2011.
49. Manish Sabraj, Vipin Kakkar, "Distribution Function Estimation of the Timing Jitter in Sample Rate Converter", International Journal of Engineering and Technology Vol. 2, No. 2, April 2010. (Scopus)
50. Manish Sabraj, Vipin Kakkar, "Impact of Input Frequency and Modulator Order on the Performance of Sample Rate Converter" in International Journal of Electronics and Communication Technology, Vol. 2 Issue 2 ( June, 2011), pp-119-121.
51. Manish Sabraj, Vipin Kakkar, "Performance Degradation of Sample Rate Converter with Output Frequency Variation", International Journal of Electronics and Communication Engineering Research and Development, Volume 1, Number 1, January-April, 2011.
52. Manish Sabraj, Vipin Kakkar, "Spectral Analysis of Sample Rate Converter", Signal Processing: An International Journal, Volume(4): Issue (4), October 2010, pp 219-217.
53. Vipin Kakkar, "Space Technology in the 21<sup>st</sup> Century", International Journal of Engineering Science and Technology, Vol. 2, No. 4, April 2010.
54. Manish Sabraj, Vipin Kakkar, "Spectrum Estimation Methods: Comparison and Performance Analysis", International Journal of Engineering and Technology, Research India Publications, Vol. 3, No. 2, 2010.
55. Manish Sabraj, Vipin Kakkar, "Distribution Function Estimation of the Timing Jitter in Sample Rate Converter", International Journal of Engineering and Technology Vol. 2, No. 2, April 2010.
56. Vipin Kakkar, "Low Power Architecture for Cochlear Implants", International Journal of Engineering Science and Technology, Vol. 2, No. 2, Feb. 2010.
57. Vipin Kakkar, "Architecture for Efficient Energy Meter", International Journal of Computer Science and Network Systems, Vol. 9, No. 11, Nov. 2009 (ESCI).
58. Vipin Kakkar, "Comparative Study of Analog and Digital Neural Networks", International Journal of Computer Science and Network Systems, Vol. 9, No. 7, July 2009 (ESCI).

**Industry Technical Reports:**

59. Vipin Kakkar, "Smart Lighting and cameras for City Councils, Sept. 2008
60. Vipin Kakkar et al, "Business Creation Technical report for Energy Meter chip", 2006
61. Vipin Kakkar et al, "Audio Processor for Car music system", Philips Electronics, 2004
62. Vipin Kakkar, "Technology transfer for testing for video amplifiers", 2002
63. Vipin Kakkar et al, "Video IP development for TV applications – One-Chip-TV", 2002"
64. Vipin Kakkar et al, "BIST and repair circuitry for SRAMs", Oct. 2002
65. Vipin Kakkar et al, "Power Model Techniques for Video application", Aug. 2002

**C. Conference/Workshop Papers/Proceedings**

66. Naira Nafees, Vipin Kakkar, Optimization and Design of Efficient D Flip-Flops using QCA Technology, 5th International Conference on Recent Innovations in Computing (ICRIC-2022), CU Jammu, India, 16-17 May 2022 (scopus)
67. Neeraj Tripathi, Vipin Kakkar, Electrical Modelling of Neuron System for Deep Brain Stimulation Microelectrode, 2nd International Conference On Science, Engineering and Management (ICSEM-2021), Sri Lanka, 26-27 August 2021.
68. Mohsin Fayaz, Mohammed Waqas, Vipin Kakkar, "A Novel Design of Reversible Toffoli Gate in Quantum-Dot Cellular Automata", 2021 International Conference for Intelligent Technologies, CONIT-2021, Karnataka, India, 25-27 June, 2021 (scopus)
69. Soha M Bhat, Suhaib Ahmed, Vipin Kakkar, "Quantum dot Cellular Automata based Design of 4x4 TKG Gate and Multiplier with Energy Dissipation Analysis", 4th International Conference on Recent Innovations in Computing (ICRIC-2021) second volume, 8-9 June 2021 (scopus)
70. Soha M Bhat, Vipin Kakkar, "Design and Modeling of an Ultra-Efficient 3x3 SSG-1 Reversible Gate for Nanoscale Applications", IEEE International Conference on Emerging Smart Computing and Informatics (ESCI), 5-7 March 2021 (scopus)
71. Akshay Lal, Rakesh Sharma, Vipin Kakkar, "A Review of Short Term Electricity Load Forecasting using Artificial Intelligence Techniques", 5<sup>th</sup> International Conference on Recent Trends and Advancements in Engineering and Technology (ICRTAET), Shri Mata Vaishno Devi University, 17-18 Jan, 2020.
72. Shagun Gupta, Purva Buttar, Suhaib Ahmed, Vipin Kakkar, "Feasibility of Lab-On-Chip Theranostic Platforms in Wireless Body Area Network" at IEEE International Conference ANTS 2019 held at BITS Pilani, Goa from 16<sup>th</sup> Dec.-19<sup>th</sup> Dec., 2019 (Scopus)
73. Shagun Gupta, Indu Bhushan, Vipin Kakkar, "Microbial Communities: Rethinking Composition and Detection" at the 5th International Conference on "Microbial diversity as a source of novelty: function, adaptation and exploitation" held at Catania, Italy from 25th-27th Sept., 2019 (Scopus)
74. Bisma Bilal, Suhaib Ahmed, Vipin Kakkar, "Multifunction Reversible Logic Gate: Logic Synthesis and Design Implementation in QCA, "Proc. of IEEE International Conference on Computing, Communication and Automation (ICCCA), Greater Noida, 5-6 May 2017 (Scopus)
75. Bisma Bilal, Suhaib Ahmed, Vipin Kakkar, "A Study on Implementation of Reversible Circuits in Quantum dot Cellular Automata for Nanotechnology Applications," One-Day IEEE EDS Delhi Chapter and IETE Sponsored Mini Colloquium (MQ) cum National Seminar on "Advances in Electronic Devices and Circuits", Department of Electronics, University of Jammu, 26 April 2017.
76. Furqan Zahoor, Swastik Gupta, Vipin Kakkar, "A Comparative Study of High Efficiency DC/DC Boost Converters for Medium Power Applications", ICRTAET Conference, SMVD University, Nov. 2017.
77. Vikram Kumar, Vipin Kakkar, "A comparative evaluation of the modulation techniques in the Soft Switched & Resonant DC to DC Converter Topology and their Control", ICRTAET Conference, SMVD University, Nov. 2017.
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