Faculty Profile

Dr. Arunkumar K, M.E.,Ph.D
Assistant Professor (SG)/ECE

HIGHLIGHTS:

- Number of Journal Publications:28
- H-Index:5
- Project Funding Received: NIL
- Patents Published:14
- Patents Granted: NIL

PROFESSIONAL LINKS:

- Scopus ID: 57772593300
- Scopus Link: https://www.scopus.com/authid/detail.uri?authorId=57772593300
- Google Scholar ID: g1zBhkQAAAAJ
- Anna University Faculty ID: 2122179
- AICTE Faculty ID: 1-2189689279
- Anna University Supervisor ID: NIL
- LinkedIn: https://www.linkedin.com/in/arunkumar-kuppusamy-54102639/

PROFESSIONAL BACKGROUND:

- Teaching Experience till date: 11 Years 10 Months
- Industrial Experience: NIL

INTERNATIONAL EXPOSURE:

AREA OF SPECIALIZATION:

- VLSI DESIGN
- HDL Programming
- Signal Processing
- Deep Learning

Ph.Ds AWARDED WITH DETAILS: NIL

Ph.Ds GUIDING:NIL

SPONSORED RESEARCH / FUNDING APPLIED / CONSULTANCY: NIL

PATENTS PUBLISHED/GRANTED:

1. Low-Power, High-Gain Bio-Signal Data Acquisition System for EEG Signal Processing – Published in 2025.
2. Optimized Low-Power CNN Accelerator for Handwritten Digit Recognition – Published in 2025.
3. Reversible Logic Based Energy Efficient Adders for High Speed Cryptographic and AI Applications – Published in 2025.
4. Real-Time Human Eye Pupil Tracking System Using FPGA – Published in 2025.
5. DCM-Based True Random Number Generator in FPGA for Enhanced Security Applications – Published in 2025.
6. IoT-Enabled Machine Learning Framework for Groundwater Level Prediction in Peatland Ecosystems – Published in 2025.
7. Cardless ATM with Dual-Layer Biometric Security – Published in October 2024.
8. Prediction of Stator Slot Size Variation in Industrial Drives Using Wavelet Transform and Machine Learning – Published in May 2024.
9. Engine Control Unit with an Efficient Cooling System – Published in May 2024.
10. IoT-Based Automation Drone-Guided Water Distribution for Precision Irrigation Management – Published in December 2023.
11. Deep Learning-Based 3D Free Space Detection – Published in November 2023.
12. Human Eye Pupil Detection System for Ophthalmology Devices – Published in November 2023.
13. Artificial Intelligence-Based Face Mask Detection and Recognition – Published in September 2023.
14. VLSI-Based Impulse Noise Cancellation to Enhance Image Quality Visually – Published in March 2022.

COURSES CERTIFIED:

- Completed AICTE-QIP-PG Certificate Programme in Artificial Intelligence And Machine Learning.
- Completed an online course titled Python Basics on Coursera, offered by the University of Michigan, from 21 April 2020 to 20 May 2020.
- Completed an online course titled VLSI CAD Part-I Logic on Coursera, offered by Illinois State University, from 01 May 2020 to 04 June 2020.
- Completed an online course titled Internet of Things on Coursera, offered by the University of California, from 14 May 2020 to 24 June 2020.
- Completed the WIPRO MISSION 10X Trainer Program.

- Completed the NPTEL online course titled “Python for Data Science,” earning a Silver+Elite certification.
- Completed the NPTEL online course titled “Data Science for Engineers,” earning a Silver+Elite certification.

ACHIEVEMENTS AND AWARDS: -

- Secured 2nd place and won ₹7.5 lakhs in the Digital Design Hackathon organized by CDAC Bangalore and ChipIN Centre under the Chips-to-Startup (C2S) Programme, an initiative of MeitY, for developing a real-time image processing system on PYNQ Z2 FPGA using Verilog HDL.

SPECIAL SESSIONS DELIVERED:

- Delivered Guest Lecture in HDL Programming at Velammal Engineering College,Chennai.
- Delivered Guest Lecture in VLSI DESIGN Rajalakshmi Engineering College,Chennai.
- Delivered Guest Lecture in LTSPICE at Sri Krishna College of Technology, Coimbatore.
- Delivered Guest Lecture in VLSI DESIGN using HDL at Sri Krishna College of Technology, Coimbatore.

CONFERENCES/SEMINARS/WORKSHOPS ATTENDED:

- Arunkumar. K, S. Sushma and V. S. Teja, "Implementing and Verifying the SPI Communication Protocol in ASICs with Cadence EDA Tools," *2024 Global Conference on Communications and Information Technologies (GCCIT)*, Bangalore, India, 2024, pp. 1-5, doi: 10.1109/GCCIT63234.2024.10861947.
- Arunkumar. K, Gokul. S, Jagadeeshwar. J and Manoj Kumar. M, "Design of Clock Tree Distributor with Systematic Scheduler for Stability," *2024 Global Conference on Communications and Information Technologies (GCCIT)*, Bangalore, India, 2024, pp. 1-4, doi: 10.1109/GCCIT63234.2024.10862149.
- Arunkumar Kuppusamy, Mangayarkarasi Panneerselvam, Ramesh Rengaswamy, and Dhandapani Samiappan, "Bio-signal data acquisition system using cadence," AIP Conference Proceedings, vol. 3159, no. 1, Art. no. 20042, 2025. doi: 10.1063/5.0248540.
- K. Arunkumar, M. V. N. Reddy, and M. Bhavya, "AI-powered wrist ultrasound for peripheral arterial disease," in Proc. 2nd Int. Conf. Intell. Cyber Phys. Syst. Internet Things (ICoICI), 2024, pp. 1630–1634. doi: 10.1109/ICoICI62503.2024.10695998.
- G. Keerthiga, T. S. Kantharuban, T. Kavibala, and K. Arunkumar, "Innovative framework for precise peripheral arterial disease diagnostics through multi-modal digital signal processing on Xilinx FPGA platform," in Proc. 3rd IEEE Int. Conf. Distrib. Comput. Electr. Circuits Electron. (ICDCECE), 2024. doi: 10.1109/ICDCECE60827.2024.10549610.

- V. A. A. Vijay, S. Abhishek, and K. Arunkumar, "Efficient neural network compression through Booth coding and exponential of two quantization for enhanced inference performance," in Proc. 4th Int. Conf. Innov. Pract. Technol. Manag. (ICIPTM), 2024. doi: 10.1109/ICIPTM59628.2024.10563484.
- D. P. Nandene, G. Nivitha, R. Priyadharshini, and K. Arunkumar, "Energy-efficient VLSI hardware for edge AI in image processing," in Proc. Int. Conf. Sustain. Commun. Netw. Appl. (ICSCNA), 2023, pp. 1605–1611. doi: 10.1109/ICSCNA58489.2023.10370425.
- R. Priyadharshini, G. Nivitha, D. P. Nandene, and K. Arunkumar, "Design of improvised DCM-based tunable true random number generator," in Proc. Int. Conf. Sustain. Commun. Netw. Appl. (ICSCNA), 2023, pp. 756–761. doi: 10.1109/ICSCNA58489.2023.10370028.
- K. J. Michael, V. Giribalan, and K. Arunkumar, "Bio-Pi cash: Next-gen cardless ATM with facial recognition and fingerprint security using Raspberry Pi," in Proc. 2nd Int. Conf. Autom. Comput. Renew. Syst. (ICACRS), 2023, pp. 273–281. doi: 10.1109/ICACRS58579.2023.10404290.
- K. Arunkumar, P. Thavaselvan, and A. Deepak Kumar, "Wireless medical sensor network based healthcare monitoring system in narrow band IoT," in Proc. 2023 Int. Conf. Comput. Commun. Informatics (ICCCI), 2023. doi: 10.1109/ICCCI56745.2023.10128355.
- V. A. A. Vijay, S. Abhishek, and K. Arunkumar, "Enhancing disease detection accuracy in machine learning through low-power multipliers," in Proc. Int. Conf. Sustain. Commun. Netw. Appl. (ICSCNA), 2023, pp. 1754–1759. doi: 10.1109/ICSCNA58489.2023.10370723.
- M. Vanitha, K. Arunkumar, A. Hemamalini, and A. Yaswanth, "A smart IoT based black-box system for automobiles," J. Phys.: Conf. Ser., vol. 2484, no. 1, Art. no. 12052, 2023. doi: 10.1088/1742-6596/2484/1/012052.
- K. Arunkumar, S. Eshwar, D. M. Saleem, and C. Vamsikrishna, "Implementation of kidney stone detection using CNN," in Proc. 5th Int. Conf. Smart Syst. Invent. Technol. (ICSSIT), 2023, pp. 1320–1324. doi: 10.1109/ICSSIT55814.2023.10061142.
- G. Dinesh, K. Arunkumar, P. Radhakrishnan, R. D. Jadhav, T. Dasari, and H. Lal, "FPGA-based power-efficient approximate 4:2 compressor for multimedia applications," in Proc. 2nd Int. Conf. Edge Comput. Appl. (ICECAA), 2023, pp. 1480–1484. doi: 10.1109/ICECAA58104.2023.10212132.

- K. Arunkumar, P. Mangayarkarasi, B. Jackson, and A. A. Juliette, "Design of high-speed, low-power 16×16 Vedic multiplier with adiabatic logic," in Proc. 8th Int. Conf. Smart Struct. Syst. (ICSSS), 2022. doi: 10.1109/ICSSS54381.2022.9782274.
- D. A. Raja P., K. Arunkumar, A. Selvarani, and P. Nithya, "Enhancement in quality of services for an IoT-based wireless sensor networks," in Proc. Int. Conf. Appl. Artif. Intell. Comput. (ICAAIC), 2022, pp. 1516–1522. doi: 10.1109/ICAAIC53929.2022.9792667.
- K. Arunkumar, R. Karthickkeyan, S. Kishore, and R. Sharan, "Booth multiplier-based robust model of FIR filters for VLSI applications," in Proc. 6th Int. Conf. Electron., Commun. Aerosp. Technol. (ICECA), 2022, pp. 249–254. doi: 10.1109/ICECA55336.2022.10009401.
- K. Janardhan, P. Parthasarathi, N. Karyemsetty, K. Arunkumar, R. Krishnamoorthy, and K. Umapathy, "Device-free human body fall detection to aid senior citizens," in Proc. 6th Int. Conf. Electron., Commun. Aerosp. Technol. (ICECA), 2022, pp. 1158–1162. doi: 10.1109/ICECA55336.2022.10009573.
- V. Amudha, R. G. Babu, K. Arunkumar, and A. Karunakaran, "Machine learning-based performance comparison of breast cancer detection using support vector machine," AIP Conf. Proc., vol. 2519, Art. no. 50011, 2022. doi: 10.1063/5.0110848.
- K. Arunkumar, R. Ramesh, R. Geethalakshmi, and T. Archana, "Low-power dynamic comparator design for high-speed ADC application," in Proc. 2018 Int. Conf. Curr. Trends Converg. Technol. (ICCTCT), 2018. doi: 10.1109/ICCTCT.2018.8550868.
- K. Arunkumar and S. Praveenkumar, "Design and simulation of microfluidic channel," in Proc. 2013 IEEE Int. Conf. Smart Struct. Syst. (ICSSS), 2013, pp. 70–73. doi: 10.1109/ICSSS.2013.6623003.
- Successfully completed the Microsoft, SAP, and AICTE-led Faculty Development Program on 'AI Evolution: From Foundations to Generative AI' under TechSaksham, held from 22nd January 2024 to 29th January 2024
- Participated in a One-Week Online Faculty Development Program on 'Outcome-Based Education' organized by the Department of Electronics and Communication Engineering, Velammal College of Engineering and Technology, from 4th December 2023 to 8th December 2023.
- Participated in the IEEE Madras Section-sponsored 5-day Faculty Development Program (Hybrid Mode) on 'Emerging Trends in Artificial Intelligence and Deep Learning,' organized by the Department of Electronics and Communication Engineering, Sri Sairam Institute of Technology, from 26th December 2023 to 30th December 2023.

- Completed the industrial training program on "Implementation of Internet of Things" conducted by TripleM Infotech Solutions Ltd from 17th July 2023 to 24th July 2023.
- Mentoring Program on Students Mentoring by Coimbatore Psychology Foundation from July 1, 2019 to December 12, 2019.
- STTP on Pedagogy for Online and Blended Teaching-Learning Process by IIT Bombay from May 3, 2018 to May 30, 2018.
- Workshop on Scilab by IIT Bombay on May 4, 2018.
- 3 Day FDP on Digital Image Processing, RF & Embedded Systems by Sree Sastha Institute of Engineering and Technology from June 20, 2017 to June 22, 2017.
- Two Week ISTE Workshop on CMOS, Mixed Signal and RF VLSI Design by IIT Kharagpur, sponsored by NMEICT, MHRD from January 30, 2017 to February 4, 2017.
- FDTP on EC6601- VLSI Design by S.A. Engineering College from December 15, 2016 to December 22, 2016.
- 2 Day FDTP on Low Power VLSI Design by KCG College of Technology on November 14, 2016 to November 15, 2016.
- INUP Familiarization Workshop on Nanofabrication Technologies by IIT Bombay from May 25, 2016 to May 27, 2016.
- FDTP on EC6403- Electromagnetic Fields by Rajalakshmi Engineering College from January 4, 2016 to January 11, 2016.
- Two Week ISTE STTP on Technical Communication by IIT Kharagpur, sponsored by NMEICT, MHRD from November 30, 2015 to December 5, 2015.
- Workshop on Kani Tamil Peravai by College of Engineering, Guindy on October 30, 2015.
- FDTP on EC6303- Signals and Systems by Rajalakshmi Institute of Technology from June 8, 2015 to June 15, 2015.
- MISSION 10X UTLP Expert by Wipro Technologies, Bangalore from January 19, 2015 to January 23, 2015.
- One Week ISTE STTP on Emerging Trends in Image Processing and its Applications by Annamalai University from December 8, 2014 to December 12, 2014.
- Two Week ISTE Workshop on Computer Networking by IIT Bombay, sponsored by NMEICT, MHRD from June 30, 2014 to July 5, 2014.
- FDTP on EC6303- Signals and Systems by Velammal Engineering College from June 16, 2014 to June 22, 2014.
- Two Week ISTE Workshop on Signals and Systems by IIT Kharagpur, sponsored by NMEICT, MHRD from January 2, 2014 to January 12, 2014.

- FDTP on EC2253 Electromagnetic Fields by Saveetha Engineering College from December 4, 2013 to December 11, 2013.
- MISSION 10X UTLP Practitioner Training Program by Wipro Technologies, Bangalore from November 25, 2013 to November 29, 2013.
- Two Week ISTE Workshop on Analog Electronics by IIT Kharagpur, sponsored by NMEICT, MHRD from June 4, 2013 to June 14, 2013.

PROFESSIONAL MEMBERSHIPS:

- Life Member of IETE (Institution of Electronics and Telecommunication Engineers) - Membership No. AM 235481, since 2013.

OTHER DETAILS :

- Achieved a GATE 2023 score of 538/1000 with an All India Rank (AIR) of 1861.

Journal Publications:

- P. Mangayarkarasi, K. Arunkumar, and A. J. Albert, "Design and Comparison of SEU Tolerant 10T Memory Cell for Radiation Environment Applications," *EAI Endorsed Transactions on Energy Web*, vol. 11, 2024, pp. 1–6. DOI: 10.4108/ew.5006.
- D. Venkatesh, V. Kanchana, S. Vasanthan, A. Kistan, P. Rajeswaran, K. Arunkumar, and P. S. Karthik, "Design and fabrication of magnetically recoverable SnO2/CoFe2O4 nanocomposite for enhanced visible light-driven wastewater treatment," *Inorganic Chemistry Communications*, vol. 166, art. no. 112657, 2024. DOI: 10.1016/j.inoche.2024.112657.
- N. Dhanasekar, S. S. Priya, K. Arunkumar, and M. A. Bennet, "Bio-waste derived 2D rGO sheet supported Co9Se8 hybrid composite electrode for high performance supercapacitor applications," *Diamond and Related Materials*, vol. 147, art. no. 111304, 2024. DOI: 10.1016/j.diamond.2024.111304.
- E. Dhanalakshmi, P. Rajesh, K. Arunkumar, T. Gnanasambandan, N. ISSAOUI, K. Sudha, and M. Raja, "Synthesis, GCMS, spectroscopic, electronic properties, chemical reactivity, RDG, topology and biological assessment of 1-(3,6,6-trimethyl-1,6,7,7a-tetrahydrocyclopenta[c]pyran-1-yl)ethanone," *Chemical Physics Impact*, vol. 7, 2023, article no. 100385. DOI: 10.1016/j.chphi.2023.100385.
- K. Arun Kumar, R. Ramesh, and S. Dhandapani, "DeBAM – ERCPAA – CNN: Hardware Efficient CNN Accelerator Design Using Decoder Based Low Power Approximate Multiplier and Error Reduced Carry Prediction Approximate Adder," *Journal of Multiple-Valued Logic and Soft Computing*, vol. 41, no. 6, pp. 537–558, 2023.

- B. Nancharaiah, K. C. Ravi, A. K. Srivastava, K. Arunkumar, S. T. Siddiqui, and M. R. Arun, "Analysis of Data Science and AI-enabled 6G Wireless Communication Networks," *Radioelectronics and Communications Systems*, vol. 66, no. 5, pp. 223–232, 2023. DOI: 10.3103/S0735272723050059.