

**BINDU SALIM, B.Tech, M.Tech., Ph.D.**  
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## **SUMMARY**

Over 35 years of experience in academics and academic research in reputed engineering colleges affiliated to state universities, playing key roles in academic development and academic administration and Research.

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## **KEY ACHIEVEMENTS**

### **Patents**

1. A molecular beacon probe and a method for quantification of miRNA copy number directly from biological fluid with molecular beacon probe” under application number 3035/CHE/2015 dated 17/06/2015 in the name of vision research foundation and PSG Institute of advanced studies.- Granted
2. System for dispensing pills under application number 841/CHE/2015, 23rd Feb 2015 in the name of Devi electronics (Startup company sponsored by Bill and Melinda Gates foundation), PSGIAS, University of Cape Town.-Granted.
3. Smart workspace booking and access control system, IP no.202441036684 published 17/05/2024

### **Awards**

1. Recipient of Bill and Melinda Gates foundation award for GCTBC-2014: Development of Pill dispenser for TB drug adherence GCTBC-2014
2. Innovation award for “Innovating to improve lives: IT solution” at International Knowledge millennium conference 2014
3. Innovation award for “Spreading innovation spirit: Medical devices” at International Knowledge millennium conference 2015
4. Awarded Senior membership of IEEE
5. Awarded the fellow of Institution of engineers India (IEI)
6. Awarded the fellow of Institution of engineers India (IETE)
7. Best teacher awards for several academic years
8. Recipient of Guinness Book of world record in relay singing in an Alumni Group

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## **CORE COMPETENCIES& EXPERTISE**

- Conceptualizing research project, organizing financial aid, setting up lab, team building.
- MEMS design using COMSOL, CoventorWare
- Microfluidics for medical applications
- Semiconductor device design using Silvaco TCAD.
- Teaching: VLSI design, Synthesis and optimization, MEMS and NEMS, Nanoelectronics
- Academic administration

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## **CAREER HIGHLIGHTS**

1. **Director -Research, Sri Shakthi Institute of Engineering and Technology, Coimbatore- Current**

**Foster research activities among faculty and students**

**2. Professor, PSG Institute of Advanced Studies, Coimbatore (March 2009- April 2023)**

**Job description:**

- Teaching undergraduate and master's students
- International program coordinator for 4 years
- Research projects funded by Govt. funding agencies
- Setting up of clean room and gas distribution: design and commissioning support
- Purchase of equipment for the clean room

**Projects:**

- Microfluidic device-based instrument for screening breast cancer using miRNA detection, PI, DST-BDTD, 2019-2021
- Design and development of Automatic pill dispenser for TB drug adherence, funded by Bill and Melinda Gate foundation. PI, 2014 - 2015 Demo
- Fabrication of PDMS based Platform / Microfluidics based MicroPCR For The Detection of Oncogenic miRNAs in Retinoblastoma Patient's Serum funded by NPMASS, DRDO, PI, 2011 - 2014
- Development of Technology for Perching, funded by IGCAR, PI, 2010-2013
- Development of wireless sensor networking, funded by NPMASS, ADA, Co-PI, 2011 - 2014
- A novel water and thermal management technique for an air-breathing proton exchange membrane fuel cell (PEMFC) stack, Co-PI, DST -2009-2012
- Process Definition, Work Centre Selection, Fabrication and Assembly of G Switch, Co-PI, ADA, Govt. of India, 2010-2012

**Experience:**

- o Project on "Screening Breast cancer by a blood test using miRNA as a biomarker", which is ready for technology transfer and clinical trial, funded by DST.
- o Design and commissioning support for the clean room and gas distribution system, finalizing the specification for equipment purchase process (PVD, CVD, Thermal evaporator, Parylene coater, Parametric analyser, Maskless lithography, spin coater, Glove box, Silvaco TCAD, CoventorWare, Comsol etc.,
- o 3 months training at University of Texas at Austin, USA in microelectronics design, fabrication and testing, clean room maintenance, safety at Pickle Research centre under the supervision of Prof. Ananth Dodabalapur.
- o In charge of international academic programs (2009-2014); responsible for developing the academic monitoring and evaluation. Program coordinator for first 2 batches of M.Tech. Nanotechnology (2010-2012).
- o Successfully completed 4 government funded research projects as principal investigator, and 2 projects as co-investigator to develop the electronics required.
- o Startup company funded by Bill and Melinda gates foundation and the first incubate from PSGIAS at STEP (Science and Technology Entrepreneur Park)-PSGTECH.
- o 2 patents filed: Pill dispensing system for TB control and microfluidic platform for cancer detection using miRNA biomarker.

**3. Professor and Head (August 2004 - March 2009)  
IEC College of Engineering and Technology, Greater Noida, Uttarpradesh.**

**Job description:**

- Professor and Head of the department of ECE
- Responsible for planning the course conduction

- Responsible for accreditation of the program by govt. agencies
- Placement and training officer
- Set up DSP and circuit simulation lab
- Institution coordinator for NBA accreditation
- Controller of examinations

**Experience:**

- As a Professor and the Head of the Department of Electronics and Communication Engineering at IEC, the department was fully developed by planning the necessary labs, faculty and overall development of students. Responsible for preparing the institute to get accredited by TCS, Infosys and Wipro for campus recruitment.
- Prepared the faculty and students of all the departments of IEC for accreditation providing training and implementation plan. Initiated technical society activities to develop the students to face the global challenge.
- A new examination conduction pattern was designed and executed as controller of examinations for 4 years at IEC.
- Co-ordinating with the approving authority (AICTE) and the university for inspections of all the programs at IEC (Engineering, MCA, MBA, Hotel Management and Pharmacy).
- Received a funded project from AICTE to set up optical communication lab in the electronics department at IEC and this was the first time IEC received a grant.

**4. Assistant Professor- Professor and Head  
PES Institute of Technology, Bangalore**

**(August 1991 - August 2004)**

**Job description:**

- Professor and Head of the department of ECE
- Responsible for planning the course conduction
- Responsible for accreditation of the program by govt. agencies

**Projects:**

- Set up microwave lab, Circuit simulation lab, Advanced microcontroller lab, Communication lab
- Institution coordinator for ISO certification
- Institution coordinator for NBA accreditation
- Received fund from AICTE to set up circuit simulation lab.

**Experience:**

- One of the key persons in the Department of Electronics at PESIT contributing to the fast phase growth of PESIT to become the most opted engineering college in Karnataka within a short span of 7 years. Initiated student centric activities like starting a department magazine, students' club, department library etc..
- PESIT was the first educational institution getting ISO certification in south Asia, I could play an important role as one of the institutional coordinators to achieve this.
- PESIT was one of the first few private institutions accredited by National Board of Accreditation- AICTE, India and I was one of the Institutional coordinators to prepare the department of Electronics and communication and the Institute as a whole for accreditation successfully.
- Responsible for planning and setting up of microwave laboratory, circuit simulation laboratory and communication laboratory at PESIT.
- Received a grant from AICTE in 1992 to set up Circuit simulation lab (Under Modernization scheme) which was the first grant to the department.
- As the Head of the Department, the department was led to the best department of the institute with lots of industry interactions, training and placement support for the students.
- Handled University examinations as deputy chief superintendent, planning student seating, faculty allocation, co-ordinating with University for inventory, question papers and conduction

of the examinations followed by sending confidential documents like answer books to the university.

- o PES was one of the nodal centers involved in designing the curriculum for Visweswaraya Technological University and could work for board of studies in designing the curriculum, course content and examination pattern.

## **EDUCATION**

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- *Bachelor of Technology in Electronics and Telecommunication Engineering, Government College of Engineering, Trivandrum, India.*
- *Master of Engineering in Electronics and Communication Engineering, Specialization VLSI, BMS College of Engineering Bangalore, India.*
- *Ph.D., Information and communication Technology, Anna University, Chennai, Tamilnadu*

## **TRAININGS & CERTIFICATIONS**

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- Certified internal quality accessor (ISO)
- Silvaco TCAD, Comsol multiphysics, CoventorWare. Motorola embedded system design, Sun microsystems embedded system design

## **Publications:**

### **Journal:**

1. B. Salim, M. Vijayakumar, K. Kokilavani, A. T. C. John and C. D. K, "Breast Cancer Screening by Blood Test using miRNAs as Biomarkers- a Point of Care Engineering Solution," 2023 International Conference for Advancement in Technology (ICONAT), Goa, India, 2023, pp. 1-5, doi: 10.1109/ICONAT57137.2023.10080408.
2. Krishnamoorthy Kokilavani, Ancy Terry C John., Bindu Salim, Madhulika Vijayakumar, and Sankar Ganesh Jeyaraj; Improved Specificity for Breast Cancer Screening Using an Oncogenic (miRNA-21) and a Gene Suppressor (miRNA-195) miRNA in the Serum for a Point of Care (POC) Screening Solution; Biomed Environ Sci, 2023; 36(6): 549-552, doi: 10.3967/bes2023.067
3. M. Vanamoorthy, B. Salim, K. Mohanta; Study on optimizing c-axis oriented AlN thin film for piezoelectric sensing applications controlling the sputtering process parameters, Applied Physics A (2022) 128:48, <https://doi.org/10.1007/s00339-021-05166-5>.
4. Bindu Salim, Teaching interdisciplinary course adapting Learning Driven by Technology, Journal of Education & Pedagogy, Volume-XIII, No. 2, Dec. 2021.
5. Bindu Salim, G.Thamayanthi, M.Vanamoorthy, Design and Optimization of Piezoelectric Pressure Sensor with AlN as piezo electric material for High-Temperature Application using COMSOL 5.3, Frontiers in Advanced Materials 6(1), pp 84-95, [Volume 6, Issue 1, Year 2024 | Frontiers in Advanced Materials Research \(sietjournals.com\)](#)
6. Bindu Salim, POC Smart Pill Dispenser for Controlling MDR-TB Ensuring Drug Adherence; Biotechnology: An Indian Journal, Vol 17(7) 2021.

7. Vanamoorthi M, Bindu Salim, Study on c-axis orientation of AlN thin film on the influence Al buffer layer and Ar/N<sub>2</sub> gas flow ratio in reactive magnetron sputtering, Vol 5(2) pp 13-18, <https://sietjournals.com/index.php/famr/issue/view/27>
8. Kokilavani K , Bindu Salim; Primary Diagnostic Tools for SARS-CoV-2 Infection (COVID-19): Mini Review Based on Current Challenges in Molecular Techniques and Point of Care Testing for Screening; International Journal of Pathogen Research 5(4): 94-104, 2020; Article no.IJPR.60810
9. Bindu Salim, Athira, M V, Kandaswamy, A, Madhulika Vijayakumar, T, Saravanan & Thiagarajan Sairam (2017), 'Microfluidic device for novel breast cancer screening by blood test using miRNA beacon probe, Biomedical microdevices', <https://doi.org/10.1007/s10544-017-0230-z>
10. Bindu Salim, Athira, M V, Kandaswamy Arumugam & Madhulika Vijayakumar (2017), 'Investigation on staging of breast cancer using miR-21 as a biomarker in patients', serum; Int. J. Biomedical Engineering and Technology, Vol. 33, No. 3, 2020
11. Bindu Salim, Swapna Merlin David, J Narayanan, Krishnakumar, S, Madhu Beta, & T Lazar Mathew 2015, 'Development of PMMA Platform based Micro fluidic Mixer for the Detection of MicroRNA-18a from Retinoblastoma Serum', J Anal Bioanal Tech, vol. 6, no. 4
12. Bindu Salim, A Kandaswamy, Athira M V, Madhulika Vijayakumar, Adityan R; microRNA based cancer screening by blood test: a review, Int. J. Pub health Res. 2018;5(1),16-25;doi:10.17511/ijphr.2018.i1.03
13. Bindu Salim, Arumugham Kandaswamy, Madhu Ganesh & Athira, M V , 'Improved mixing efficiency and scaling of microfluidic mixer for miRNA based diagnostics', BioTechnology: An Indian Journal, vol. 13, no. 5, p. 150, 2017
14. Bindu Salim, Swapna Merlin David, J Narayanan, S Krishnakumar, Madhu Betha, T Lazar Mathew; "Development of PMMA Platform based Micro fluidic Mixer for the Detection of MicroRNA-18a from Retinoblastoma Serum", J Anal Bioanal Tech 2015, 6:4
15. Bindu Salim, Jaisree Meena Pryia KNJ , "Fabrication of Poly (methyl methacrylate) and Poly(vinyl alcohol) Thin Film Capacitors on Flexible Substrates", 2015 IOP Conf. Ser.: Mater. Sci. Eng. 99 012026
16. Bindu Salim, K.K. Venkataraman; "Study on polymer printed resistor on plastic adding nanomaterials to PEDOT: PSS" is published in international journal of Nano technology and applications, Special issue, Vol 5; No.2; 2011; pp 123-128.
17. Sakthivel R, Bindu Salim; "Development and Performance of Circular shaped Ionic Polymer Metal Composite"; International Journal of Applied Engineering Research ISSN 0973-4562 Volume 6, Number 5 (2011), pp. xxx-xxx © Research India Publications <http://www.ripublication.com/ijaer.htm>
18. JN Madhu Betha, Subramanian Krishnakumar, Sailaja V Elchuri, Bindu Salim, A Comparative Fluorescent Beacon-based Method for Serum microRNA Quantification, Analytical Sciences 31 (3), 231-235, 2014
19. Book: A Brief Overview on microRNA-based Cancer Screening by Blood Test, Bindu Salim, A. Kandaswamy, M. V. Athira, Madhulika Vijayakumar, Research Highlights in Disease and Health Research Vol. 5, 31 March 2023, Page 131-145, <https://doi.org/10.9734/bpi/rhdhr/v5/4572C>

#### Conference:

1. Bindu Salim, Madhulika Vijayakumar, Kokilavani K, Ancy T John, Chandradevi K, “Breast cancer screening by blood test using miRNAs as biomarkers- a Point of Care engineering solution”, IEEE conference on Advanced technologies, 24-26 Jan 2013, Goa.
2. Bindu Salim, A. Kandaswamy, Madhu Ganesh, Scalability study of microfluidic Mixers for miRNA-based diagnostics, ASME 2017 International conference on nano, micro and mini channels, Aug 27-30, 2017, Cambridge, MA
3. Bindu Salim, A. Kandaswamy, Madhulika Vijayakumar; Cancer screening by a cost-effective blood test using handheld devices, 11th Annual world cancer congress | 18-20 May 2018 | Philadelphia, PA
4. Bindu Salim, A. Kandaswamy, Madhulika Vijayakumar; Breast Cancer screening by cost effective blood test using miRNA 21 expression; International conference on cell science and molecular biology, 17-19, September 2018, Paris, France.
5. Bindu Salim, “Spreading innovation spirit : Medical devices”, (Microdevice for screening cancer by blood test) at International Knowledge millennium conference Nov 2-3, 2015, IKP Knowledge park, Hyderabad.
6. P.Biji, Bindu Salim, Anju Gupta, T.Lazar Mathew, P.Radhakrishnan, A.Sukhananazerin and D.Jayaseelan, Development of Portable Toxic Gas Sensors Based on Hybrid Metal Nanoparticles-SWNT Composite Nanofibers For Environmental Monitoring, Technology & Engineering Exhibition (TechEx 2011), Codissia Trade Fair Complex, November 25-27, 2011
7. Jayaseelan D, Bindu Salim, Sukhananazerin A, Biji P and Lazar Mathew T, ZigBee based Wireless System for f-MWCNT based Ammonia Gas Sensor for Clinical Breath Analyzer Applications, International Conference on Innovative Trends In Electronics Communication and Application – 2013 (ICIECA-2013), 27-29th December, 2013.
8. K K Venkataraman, Bindu Salim; “Intermediate printing technique for flexible electronics” ICMF 2011, Govt. College of Engineering, Trissur
9. Bindu Salim; Poster presented at ICONSAT 2012 on “Nanoindentation for developing nanohairs”.
10. Bindu Salim, C.P Sridhar; Poster on IT solutions for TB Drug adherence at IKMC - International Knowledge Millennium Conference, 2014.

**Professional membership:**

**SM-IEEE, F-IE(I), F-IETE, LM- ISSS, LM-MRSI, LM- ISTE, LM ISSE**

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