

# Dr. Roopa R. Kulkarni

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## **Profile Summary**

19 years of academic career in the area of Embedded Electronics with wide experience viz mentoring students, representing international conferences, joint publications and executing of award winning industry academic projects. Actively pursuing career in recent topics of Embedded systems and VLSI with an IOT applications, design of cyber physical systems for the use of Industry. Expertise in establishing rapport and building trust with students from a variety of backgrounds, including first generation college students. Possess strong written and verbal communication skills and ability to partner across departments to meet the needs of students.

## **Career Summary**

- Involved in the design, development and execution of undergraduate and post graduate syllabus and laboratory session of autonomy institution/ organization.
- As a reviewer and a member of Advisory/steering committee at International Conference on Recent Trends in Computer Science and Electronics, January 2016, Parkrolay Kuala Lumpur, Malaysia.
- As a reviewer and a member of Advisory/steering committee at International Conference on Green Computing and Engineering Technology, July 2015, Dubai, UAE
- Invited as a Resource person to deliver talks, conduct workshops and seminars on the topics related to Industry and Academia.
- Recognized as the subject matter expert at VTU to deliver a online lecture series for the subject "Microcontrollers" and "Fundamentals of CMOS VLSI" and also at NPTEL-VTU online course development.
- Articulated with the blend of mentoring students for industry-Academia projects
- Involved in enhancing my technical skills by attending workshops, conferences and seminars in the field of Real Time Embedded Systems, VLSI, ARM Processors, MSP430 Processors, Fuzzy Logic, and Neural Network.

- Initiative in organizing workshops and seminar by Industry experts and Academicians for the students and faculty.

### Areas of Interest

- Application of Low Power VLSI Design Techniques to System-on-Chip and Multicore Architectures, IoT.
- Designing, Programming and Developing of Embedded Systems and Architecture
- Multi cores and Network-on-Chip/System-on-Chip Architecture
- Analyzing the impact of Power in Embedded Architectures

### Summary of Education

Degree	Specialization	Institute/University	Year	Grade
Ph. D.	Efficient Power Optimization Techniques for High Speed VLSI Systems.	REVA Research Centre, V.T.U., Belagavi	Registered in 2009	Awarded on 18th of March 2019
M.Tech	VLSI Design and Embedded Systems	V.T.U., Belagavi	2003-2005	78.55 % Distinction
B.E.	Electronics and Communication Engineering	KLS Gogte Institute of Technology, Belagavi Karnataka University Dharwad	1995-1999	72.1% Distinction

### Publications

#### International Journal:

- ✓ Avanti D. Joshi and Roopa R. Kulkarni, " Data Analysis of Electric Vehicle Battery", *International Research Journal of Engineering and Technology*, May 2019,
- ✓ Roopa R. Kulkarni and S. Y. Kulkarni, "Power Efficient Design, Implementation and Analysis of 72-Point Pipelined FFT Using Clock Gating Techniques," *Journal of Advanced Research in Dynamical and Control System*, 15th-Special issue, pp 927-935, 2017. ISSN:1943-023X - SCOPUS Indexed
- ✓ Roopa R. Kulkarni and S. Y. Kulkarni, "IO Standard based Implementation and Power Analysis of a 16-bit Processing Element (ALU) for a 45 nm Technology," *Elsevier Science Direct*, pp 200-207, 2014. (3rd National Conference ATEES-2014)

- ✓ Sudhakar Hallur, Roopa Kulkarni, and Dr. Prashant P. Patavardhan," Smart Components for Smart Energy Meter," *International Journal of Advance Research in Engineering Science and Technology*, Volume 04, Issue 3, March 2017.
- ✓ Sudhakar Hallur, Roopa Kulkarni, and Dr. Prashant P. Patavardhan," Smart Energy Meter - A Survey," *International Journal of Advance Research in Engineering Science and Technology*, Volume 04, Issue 04, April 2017.
- ✓ Roopa Kulkarni and Dr. S. Y. Kulkarni, "Hierarchical Power and Activity Analysis of an Clock Gated ALU," *International Journal for Research in Applied Science & Engineering Technology (IJRASET)*, May 2014. [ISSN: 2321-9653](#)
- ✓ Roopa Kulkarni and Dr. S. Y. Kulkarni, "High Speed Low Power Network Processors: Efficient Power Management Techniques," *International Journal of Engineering and Innovative Technology*, December 2012. [ISSN: 2277-3754](#)
- ✓ Mahesh Kamat and Roopa Kulkarni, "A Review -Analysis Of Lossy Video Compression Technique," *International Journal For Technological Research In Engineering*, Volume 2, Issue 12, August - 2015.
- ✓ Mahesh Kamat and Roopa Kulkarni,"Analysis of Lossy Video Compression Technique," *International Research Journal of Engineering and Technology (IRJET)*, Volume 2, Issue 6 September 2015.
- ✓ Narasimalu N. S. and Roopa Kulkarni," **Energy Efficiency in Wireless Sensor Networks using BPR**," *International Research Journal of Engineering and Technology (IRJET)*, Volume 2, Issue 6, September 2015.

#### 📚 **BOOK SERIES:**

- ✓ Sneha Mangalwedhe, Roopa R. Kulkarni, and S. Y. Kulkarni, "*Low Power Implementation of 32-bit RISC Processor with Pipelining*," as book chapter in Scopus Book Series LNEE [Lecture Note in Electrical Engineering] Vol. 476, pp 307-320, Springer, Singapore
- ✓ Roopa R. Kulkarni and S. Y. Kulkarni, "Power Optimization of a 32-bit ALU using Distributed Clock Gating Technique," First International Conference on Advances in Electrical and Computer Technologies, 2019, at Coimbatore, 26th -27th April 2019. Accepted for presentation and considered for publication in

Springer's Lecture Notes in Electrical Engineering (LNEE) series which is indexed in ISI Proceedings, SCOPUS etc

#### International Conference:

- ✓ Roopa R. Kulkarni and S. Y. Kulkarni, "Power Optimization of a 32-bit ALU using Distributed Clock Gating Technique," *Proceedings of First IEEE International Conference on Advances in Electrical and Computer Technologies, 2019, 26th -27th April 2019.*
- ✓ Sudhakar Hallur, Roopa Kulkarni, P. P. Patavardhan, and Sagar Santagi, "Web Based Smart Energy Metering System," *Proceedings of IEEE International Conference on Circuits and Systems in Digital Enterprise Technology (ICCSDET-2018), 21st and 22nd Dec. 2018.*
- ✓ Sneha Mangalwedhe, Roopa Kulkarni, and S. Y. Kulkarni, "Low Power Implementation of 32-bit RISC Processor with Pipelining," *Proceedings of 2nd International Conference on Microelectronics, Computing & Communication Systems (MCCS-2017), Indian Society for VLSI, May 2017.*
- ✓ Roopa Kulkarni and Dr. S. Y. Kulkarni, "Power Efficient Design, Implementation and Analysis of a 72-point Pipelined FFT using clock Gating Technique," *Proceedings of International Conference on Recent Trends in Electrical Sciences & Medical Engineering, ICRTESME - 2017, MIT, Manipal, 9 - 10 August 2017.*
- ✓ Roopa Kulkarni and Dr. S. Y. Kulkarni, "Energy Efficient Implementation of 16-Bit ALU using Block Enabled Clock Gating Technique," *Proceedings of IEEE INDICON 2014, 11th Dec-12th Dec 2014. DOI: [10.1109/INDICON.2014.7030531](https://doi.org/10.1109/INDICON.2014.7030531)*
- ✓ Roopa Kulkarni and Dr. S. Y. Kulkarni, "Power Analysis and Comparison of Clock Gated Techniques Implemented on a 16-bit ALU," *Proceedings of IEEE I4C2014, MSRIT, Bengaluru, 20th Nov - 22nd Nov 2014. DOI: [10.1109/CIMCA.2014.7057835](https://doi.org/10.1109/CIMCA.2014.7057835)*
- ✓ Roopa Kulkarni and Dr. S. Y. Kulkarni, "Energy Efficient Implementation, Power Aware Simulation and Verification of 16-bit ALU using Unified Power Format Standards," *Proceedings of IEEE International Conference on Advances in Electronics, Computer and Communications, 9th Oct-11th Oct 2014. DOI: [10.1109/ICAIECC.2014.7002460](https://doi.org/10.1109/ICAIECC.2014.7002460)*

- ✓ Roopa Kulkarni and Dr. S. Y. Kulkarni, "Implementation of Clock Gating Technique and Performing Power Analysis for Processor Engine (ALU) in Network Processors," *Proceedings of IEEE International conference on Electronics and Communication Systems 2014*, Coimbatore, 13th - 14th Feb 2014. DOI: [10.1109/ECS.2014.6892770](https://doi.org/10.1109/ECS.2014.6892770)
- ✓ Roopa Kulkarni and Dr. S. Y. Kulkarni, "Low Power Strategies for Network Processors: A Survey," *Proceedings of 5th IEEE International Conference on "Advanced Computing and Communication Technologies"*, APIIT SD India, November 2011.
- ✓ Roopa Kulkarni and Dr. Hansraj Guhilot, "Modelling of variable Threshold Floating Gate MOSFET for Analog Signal Processing," *Proceedings of International Conference on RF and Signal Processing System (RSPS-2008)*, K.L. College of Engg.,Guntur, A.P.

#### **National Conference:**

- ✓ Roopa Kulkarni and Dr. S. Y. Kulkarni, "IO Standard Based Implementation and Power Analysis of a16-bit Processing Element (ALU) for a 45nm Technology," *Proceedings of ATEES -2014*, 21st and 22nd March 2014.
- ✓ Roopa Kulkarni and Dr. Hansraj Guhilot, "Design and Simulation of Multiple Input Floating Gate Opamp," *Proceedings of Second National Conference on Emerging Trends in VLSI Design*, PSG College of Technology, Coimbatore.
- ✓ Roopa Kulkarni and Dr. Hansraj Guhilot, "Sigma-Delta ADC for Bio-Informatics Data Logger," *Proceedings of National Conference on Bioinformatics Computing (NCBC'05)*, Thapar Institute of Engineering and Technology, Patiala.
- ✓ Roopa Kulkarni and Dr. Hansraj Guhilot, "Design and Implementation of Low-Drop out Voltage regulator," *Proceedings of National Conference on VLSI Design and Embedded Systems*, Adhiyaman College of Engg., Hosur.

#### **Member of Professional Bodies**

- Life Member ISTE
- Member ISA (Staff Advisor - Student Chapter)
- Student Member IEEE

#### **Certification Courses and FDPs Completed**

- ✓ NPTEL Online Certification Course and half FDP of one week on "**Effective Engineering Teaching in Practice**" with Elite during April 2019.

- ✓ NPTEL Online Certification Course and One and a half week FDP on "**Introduction to Industry 4.0 and Industrial Internet of Things**" with Elite during April 2019.

## Recognition/ Honors

- ✓ Won the best paper award at National Conference ATEES - 2014
- ✓ Won the best paper award at Second National Conference on "Emerging Trends in VLSI Design", Organized by PSG College of Technology, Coimbatore
- ✓ Awarded with Dale Carnegie - High Impact Training Skills certificate

## Work Experience

Organization	Designation	Duration
Dayananda Sagar Academy of Technology and Management, Bengaluru	Associate Professor	Since 4th November 2019
KLS Gogte Institute of Technology, Belagavi	Associate Professor	5months (20th February 2019 2nd November 2019)
KLS Gogte Institute of Technology, Belagavi	Assistant Professor	11 years 5 months ( August 2007 to 19th February 2019)
KLE College of Engineering and Technology, Belagavi	Lecturer	6 years 4 months (April 2001 to August 2007)
Manipal Institute of Technology, Manipal	Lecturer	6 months (October 2000 to April 2001)
Maratha Mandal Engineering College, Belagavi	Lecturer	6 months (April 2000 to October 2000)

## Details of Work Experience

🚩 Projects Mentored: UG projects - 30

- ✓ **Karnataka State Council for Science and Technology (KSCST) sponsored projects:**
  - ✓ Soil Sensor for Macro-Nutrients Detection and Estimation in collaboration with **ISRO, Bangalore**
  - ✓ Automated Helping Aid using Wireless Communication
  - ✓ Master -Slave Robotic Arm Using Microcontroller (Best Student Project)
  - ✓ IOT Enabled Smart Solar Inverter.
- ✓ **Industry/NAIN Projects taken up**
  - ✓ TOBOT- A Tower Climbing Robot(Future Robo Systems, Hubbali)

- ✓ Air Pollution Monitoring System (Future Robo Systems, Hubballi)
- ✓ Data Acquisition of a CNC Machine ( Galaxy Machinery, Belagavi)
- ✓ **Projects guides (other than academics)**
  - ✓ Guided two projects titled," **Apatbandhu- ARM controlled emergency help**" and "**Automated Toll Plaza**", participated and presented in the final round at ACCS ARM Design Challenge 2018.
  - ✓ Initiated, Trained and guided students for e-yantra Robotic competition, IIT Mumbai.

✚ Organized a Two Day Technical Symposium on "Career Horizon in Automotive Industries" on 12th and 13th April 2017, for the students, faculty and Industry.

### ✚ **Technical Skills:**

- Languages: C, Verilog Hardware Descriptive Language, and Embedded C
- Platform: Linux and windows
- Embedded Tool: Keil and AVR IDE
- VLSI FPGA Tools: Questa Sim, Leonardo and Precision RTL
- VLSI backend Tools: Pyxis, Caliber, and Eldo
- Assembly Language and Embedded C Programming: ARM Processors (ARM 7 & ARM Cortex M3), Microcontrollers (8051 and MSP430), and Microprocessor 8086
- Familiarity with: Unix system programming

### ✚ **Laboratories Developed**

#### 1. **VLSI Laboratory**

- Installation and Upgradation of the tools namely: Cadence and Mentor Graphics Software (ModelSim, Leonardo Spectrum, IC Station/Pyxis Calibre, AMS, Calibre) required for the designing and verifying at different stages of the VLSI circuits/system.

#### 2. **Microcontroller Laboratory**

- Installation and Upgradation of the software namely: Keil and AVR required for developing the software and interfacing programs for Advanced Processors (ARM 7), 8051 microcontroller and MSP430 Processor.

## **Resource Person at VTU**

- ✓ Subject Matter Expert in developing additional course material for the subject "**Microcontroller and its Application**" as a part of VTU-NPTEL e-learning course material
- ✓ Subject Expert at VTU Edusat Program-11 for the subject **Fundamentals of CMOS VLSI**
- ✓ Subject Expert at VTU Edusat Program-10 for the subject **Microcontrollers**

## **Resource Person at Faculty Development Program (FDP) on**

- ✓ Invited as a resource person to deliver a talk on "Modern Trends in Microcontrollers", 30th March 2017, at Shri Vasant Rao Potdar Polytechnic, Belagavi
- ✓ Invited as a resource person to deliver a talk on "Modern Trends and Developments in Digital Electronics", 7th October 2016, at Shri Vasant Rao Potdar Polytechnic, Belagavi
- ✓ Invited as the resource person during May 2016, at Hirasagar Institute of Technology, Nidasoshi,
- ✓ Invited as the resource person during September 2015, at Sharad Institute of Technology College of Engineering, Ichalkaranji,
- ✓ As a resource person to deliver a talk on "How to read Technical Papers", at department of E & C Engg, KLS Gogte Institute of Technology, Belagavi.
- ✓ Recent Trends in VLSI Design and Embedded Systems organized by APPA Institute of Engineering and Technology, Gulbarga, 2014.
- ✓ Teaching Methodology organized by Vasant Rao Potdar Polytechnic, Belgaum, 2013.
- ✓ Faculty Orientation Program organized by Internal Quality Assurance Cell of Gogte Institute of Technology, Belgaum during 21st - 23rd July 2014
- ✓ e-based FDP "AARAMBHA" of Wipro Technologies, Bangalore as a part of Mission10X for the newly recruited faculty, at Gogte Institute of Technology, Belgaum during 2012
- ✓ Teaching - Learning Process FDP "Reflections" for the young staff of Gogte Institute of Technology, Belgaum during 2009

## **Workshops Organized for Faculty**

- ✓ Organized a Two Week ISTE STTP on "CMOS, Mixed Signal and RF VLSI Design", during 30th January, 2017- 04th February, 2017, conducted by IIT, Kharagpur.
- ✓ Organized a two day workshop for faculty on "The Power of FPGA and ASIC Design using Mentor Graphic Tools", on 10th and 11th of March 2014



- ✓ Organized and Coordinated a two workshop on FPGA and ASIC Flow design with Mentor Graphics Tools on 13th and 14th Oct 2014
- ✓ Organized and Coordinated a two day workshop on Texas Instruments MSP430 Processor for faculty of North Karnataka engineering faculty during 17th Nov -18th Nov 2011.
- ✓ Organized a three day faculty development program "Reflections - a Teaching - Learning Methodology" for the newly recruited faculty of GIT, during March 2009.
- ✓ Conducted basic computer course for the non-IT professionals: Lawyers of InfoTech law and Nursing (B. Sc.) during 2005 at KLE College of Engg. & Tech., Belgaum

### **Workshops Organized for Students**

- ✓ As a Coordinator for the e-learning certification course on IEEE Blended Learning Program in VLSI during 2016.
- ✓ Co-ordinated and Organized a One week Workshop on " High Performance Application Development with ARM", during 8th July 2016 - 14th July 2016
- ✓ Co-ordinated and Organized a two day Workshop for the students on "Programming ARM Cortex M3", by E.S.S., Bangalore, during April 2016.
- ✓ Organized, Coordinated and was the Resource Person at the One-week Workshop on "Microcontroller and Embedded Programming" for the students of Non-IT branch, during 20th July 2015-24th July 2015.
- ✓ Organized a two-day Zonal level workshop/competition on "Bluetooth-Robotics" conducted by Robosapiens Technology, Delhi, for the students, at GIT, Belgaum, during Feb 2015.
- ✓ Organized and Coordinated a two workshop on FPGA and ASIC Flow design with Mentor Graphics Tools on 13th and 14th Oct 2014, at GIT, Belgaum.
- ✓ Organized a two-day Zonal level workshop/competition on "Mobi-Robotics" conducted by Robosapiens Technology, Delhi, for the students, at GIT, Belgaum.
- ✓ Organized a two-day Zonal level workshop/competition on "Haptic Arm Robotic" conducted by Technophilia Systems, Mumbai, for the students of Belgaum region, at GIT, Belgaum.

- ✓ Instrumental in motivating, preparing and guiding students to participate e-yantra Robotic Project Competition by IIT, Mumbai for three consecutive year. As a result Five teams have completed the process and presently Seven teams have been selected and working on the project.
- ✓ Organized a National Conference on “Emerging Trends in IT - iflip ‘07” during May 2007 at KLECET, Belgaum

### **Workshops Attended - One / Two Week**

- ✓ One-week ISTE STTP coordinators workshop on "CMOS, Mixed Signal and RF VLSI Design", during September 2016 at IIT, Kharagpur.
- ✓ One week Faculty Development Programme on "Advanced Microcontrollers for Embedded Systems" KLE Dr. M. S. Sheshgiri College of Engineering and Technology, Belagavi. 19<sup>th</sup> to 24<sup>nd</sup> January 2016
- ✓ Two-week ISTE workshop on, " Pedagogy for Effective use of ICT in Engineering Education", June - July 2014, conducted by IIT Mumbai
- ✓ Two weeks ISTE workshop on, "Signal & Systems", December 2013, conducted by IIT Kharagpur.
- ✓ Two- week ISTE workshop on, "Analog Electronics", June 2013, conducted by IIT Mumbai.
- ✓ Ten-days ISTE workshop on “Introduction to Research Methodologies”, June-July 2012, conducted by IIT Mumbai.
- ✓ Six-days training on “Cadence VLSI Tools (Virtuso, IUS, Encounter, SOC)”, conducted by the Cadence Design Systems, Bangalore during March 2003

### **Workshops Attended - Less than a Week**

- ✓ Two day Workshop on "Introduction to LATEX" , Department of Mathematics, KLS Gogte Institute of Technology, Belagavi, 3<sup>rd</sup> and 4<sup>th</sup> March 2016
- ✓ Two day Faculty Development Programme on "Graphical System Design Approach in Engineering Education and Research", Department of Electronics & Communication Engineering, KLS Gogte Institute of Technology, Belagavi, 28<sup>th</sup> and 29<sup>th</sup> January 2016.
- ✓ One - day Symposium on "Flexible Manufacturing Systems and Robotics", organized by

Industry Institute Partnership Cell, KLSGIT, Belagavi, on 8th July 2015.

- ✓ One - day workshop on "Neuro-Linguistic Programming", organized by Rotary Club, Hubballi on 28th June 2015.
- ✓ One - day faculty development program on "ANN and Fuzzy Logic Implementation using MATLAB", on 7th May 2015, at KLSGIT, Belagavi
- ✓ Two-day ISTE workshop on "Aakash", during 10<sup>th</sup> -11<sup>th</sup> Nov 2012, conducted by IIT Mumbai
- ✓ Two-day workshop on MSP430 Processor, 16th April - 17th April 2012, at KLESCET, Belgaum
- ✓ Four-day workshop on Network Simulation - A beginners Approach during 16th Feb - 19th Feb 2012, at VTU, Belgaum
- ✓ Two-day workshop on OBE during 20th Jan - 21st Jan 2012 at GIT, Belgaum
- ✓ Five-day Faculty Development Training Program "mission10x", conducted by Wipro, India during March 2008.
- ✓ Four-day training on "Cadence VLSI Tools", conducted by the Cadence Design Systems, VTU, Belgaum.
- ✓ Two-day workshop on "Embedded System Software", conducted by IIT, Bombay.
- ✓ Two-day workshop on "Embedded Systems and Energy Management", conducted by KLECET, Belgaum.
- ✓ Four-day workshop on "Microcontroller, Embedded System Design and its Industrial Applications", conducted at K.L.E. College of Engg. and Tech., Belgaum.
- ✓ Workshop on "Latest Trends in VLSI Design & Embedded Systems", conducted by V.T.U., Belgaum.
- ✓ Three-day workshop on "Self and Career Development Programme", conducted by V.T.U., Belgaum

The above stated information is true to the best of my knowledge and belief.

## References

1. Dr. S. Y. Kulkarni  
(Research Guide),  
Vice Chancellor,  
REVA University,  
Bengaluru.

2. Dr. D. H. Rao  
Director,  
Cambridge Institute of Technology,  
Bengaluru.

Yours sincerely



Place: Belagavi.

Date: 10-12-2019

(Dr. Roopa R. Kulkarni)