ECE Newsletter May 2023

RSET
RAJAGIRI SCHOOL OF ENGINEERING & TECHNOLOGY (AUTONOMOUS)

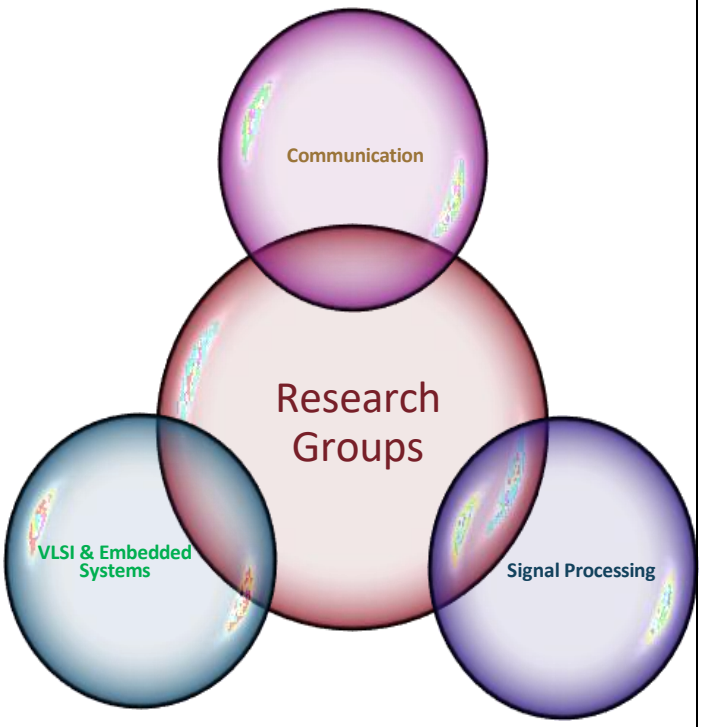
VISION:

To evolve into a premier technological and research institution, moulding eminent professionals with creative minds, innovative ideas, and sound practical skill, and to shape a future where technology works for the enrichment of mankind.

MISSION:

To impart state-of-the-art knowledge to individuals in various technological disciplines and to inculcate in them a high degree of social consciousness and human values, thereby enabling them to face the challenges of life with courage and conviction.

The Way Forward:



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About the Department

HOD: Dr. Jisa David

VLSI Research Group:
Dr Jobin K Antony

Communication Research Group:
Dr. Jaison Jacob

Signal Processing Research Group:
Ms. Harsha A

Editor:
Ms. Sunitha Wilson Gomez

Staff Activities:
Mr. Abhishek Viswakumar

Staff Activities Publications
Ms. Sunitha Wilson Gomez

Student Activities
Mr. Rony Antony

Placement Activities:
Mr. Kiran K A

Short Term Courses:
Dr.Simi Zerine Sleeba

Lab new S/W & H/W:
Mr. Abhishek Viswakumar

Mentoring Activities:
Ms. Preethi Bhaskaran

Alumni Activities:
Mr. Bonifus P L

Industry Interactions:
Mr. Karunakara P Menon

From the HOD's Desk

Welcome to the Dept. of ECE, at RSET, Kochi. This newsletter will be covering departmental activities of staff and students and the major milestones achieved.

In the month of April -May 2023, the major activities of our department

- Technical staff upgradation program
  - Workshop on 8051 Microcontroller
  - Workshop on MATLAB for Communication
- Cadence training program conducted for staff and students
- Workshop on "Embedded Systems: RTOS and TCP/IP communication" for RSET students by Frankfurt University faculty members
- Chips To Startup(C2S) Programme
- Faculty and Student Research Activity
- PARUDEESA-Recollecting Memories at RSET for S8 students
- PROJECT EXPO
- Student Activities

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Technical Staff Upgradation Program

Course Name: Workshop on 8051 Microcontroller

Date: 18/04/2023

Venue: Embedded Systems Lab

Resource Person: Mr. Anoop Thomas & Mr. Nitheesh Kurian

The workshop began with an introduction to microcontrollers and their significance in embedded systems.

Topics Covered in the Session:

1. Basics of 8051 microcontrollers, including their architecture, memory organization, and instruction set.
2. Various peripherals and their functionalities, such as timers, UART, and I2C.

The participants were then given hands-on training on programming 8051 microcontrollers using Keil IDE and assembly language. They were guided through the process of writing and executing simple programs to perform tasks like interfacing LEDs, switches, and LCD displays with the microcontroller. The resource persons also demonstrated how to use timers and interrupts effectively in microcontroller programming.

In addition to programming, the workshop covered topics like serial communication, interfacing with sensors and actuators, and debugging techniques. The participants were provided with practical examples and real-world applications of 8051 microcontrollers, including industrial automation, home automation, and IoT applications.

The workshop also included interactive sessions, where the participants had the opportunity to ask questions and clarify their doubts.

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Technical Staff Upgradation Program

Course Name: Workshop on "MATLAB for Communication – Session 1"

Date: 29/04/2023

Venue: Signals & Systems Lab

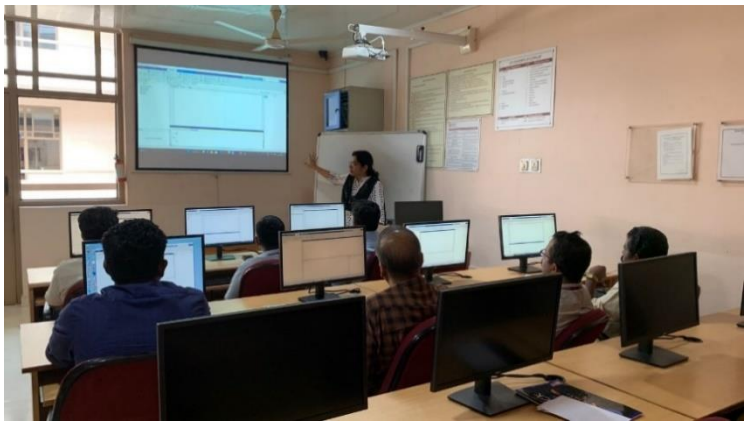
Resource Person: Ms. Anila Kuriakose, Ms. Neethu Radha Gopan

Objective of the Workshop:

Familiarization of the basic concepts of Analog/Digital Communication with hands-on experience in MATLAB programming.

Workshop Content:

1. Familiarization of the main features of MATLAB integrated design environment and its user interfaces.
2. Familiarization of MATLAB commands, with an emphasis on creating variables, accessing, and manipulating data in variables, matrix manipulation and creating basic visualizations.
3. Introduction to the concepts of analog modulation (AM & FM) with hands-on experience in MATLAB programming.



The workshop was taken forward in an interactive manner and all queries from the participant's end were addressed by the resource persons.

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Two-day Cadence Training Program

Course Name: IC design using the Cadence Virtuoso tool suite

Date: 19/04/2023 to 20/04/2023

Venue: Shockley Lab, PG Block

Resource Person: Mr. Priyanshu Datta, EntupleTechnologies Pvt. Ltd, Bangalore

Co-ordinators: Mr. Rony Antony, Mr. Bonifus P L, Mr. Kiran K. A

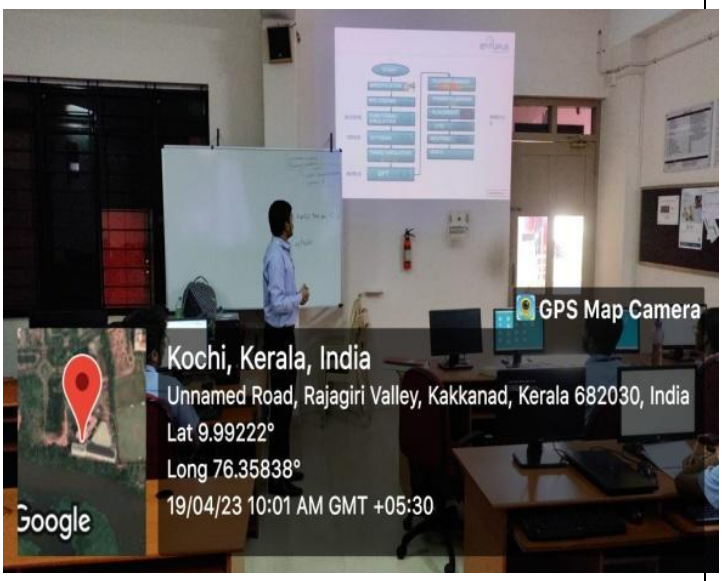
The Department of Electronics and Communication Engineering at Rajagiri School of Engineering and Technology (RSET), in collaboration with Entuple Technologies Pvt. Ltd, Bangalore, organized a two-day training program titled "IC Design Using Cadence Virtuoso Tool Suite." The program was held on April 19th and 20th, 2023, at the Shockley Lab in the PG Block.

The training aimed to equip both faculty members and students with comprehensive knowledge and practical skills in the field of IC design utilizing the Cadence Virtuoso tool suite. The training program spanned two days, from 9:00 AM to 4:00 PM, providing attendees with a rigorous and engaging learning experience. Participants were introduced to various aspects of IC design and guided through hands-on sessions using the Cadence Virtuoso tool suite.

The two-day Cadence Tools Training program at Rajagiri SET, Ernakulam - Kerala, was a successful and engaging event. With a total of 23 participants, including 7 faculty members and 16 students, the program provided valuable insights and hands-on experience in utilizing Cadence tools for IC design.

Topics covered in the training:

Day 1: April 19th, 2023



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Session 1: 10:00 am - 1:00 pm

- Introduction to Semi-Custom IC Design Flow
- Cadence Solutions for Semi-Custom IC Design
- Functional Verification using Incisive
- RTL Synthesis using Genus Synthesis Solution

Session 2: 2:00 pm - 5:00 pm

- Physical Implementation using Innovus
  - Timing Analysis
  - Power Analysis
  - Parasitic Extraction
  - Generation of GDSII

Day 2: April 20th, 2023

Session 3: 10:00 am - 1:00 pm

- Introduction to Full Custom IC Design Flow
- Cadence Solutions for Custom IC Design
- Schematic Capture using Virtuoso Schematic Editor
- Symbol Creation
- Test-bench Creation using Virtuoso Schematic Editor
- Functional Simulation using Spectre

Session 4: 2:00 pm - 5:00 pm

- Layout Design using Virtuoso Layout Editor
- Physical Verification including DRC & LVS
- Parasitic Extraction using Quantus
- Post Layout Simulation
- Generation of GDSII

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Chips To Startup Programme

A research project worth 86 lakhs under the title, "A RISC V- based hardware accelerator for anomaly detection in autonomous security systems", has been approved by the Ministry of Electronics & Information Technology (MeitY) under Chips to Startup (C2S) Programme vide Document No. EE-9/2/2021-R&D-E dated 22.05.2023.

The project aims to develop a VLSI semiconductor component along with its software framework which will be an integral part of a video analysis system designed for autonomous classification and anomaly detection in real-time video streams from CCTV cameras.

The Team Members are:

Dr. Jobin K Antony (Principal Investigator), Professor, ECE
Dr. Simi Zerine Sleeba, Asst Professor, ECE
Mr. Karunakara P. Menon, Asst Professor, ECE
Fr. Dr. Jaison Paul Mulerikkal CMI, Professor, IT

Upcoming Events

RSET has signed a Memorandum of Understanding (MoU) **with Frankfurt University of Applied Sciences** in July 2020.As a part of this collaboration, it is proposed to conduct a workshop on "**Embedded Systems: RTOS and TCP/IP communication**" for RSET students by Frankfurt University faculty members. The suggested duration of the program is from May 29th to June 2nd ,2023. Around 16 participants are expected from RSET (both B. Tech and M. Tech together).

Coordinator
Dr. Jobin K. Antony

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Faculty and Student Research Activity

Staff Research Publications

Sl No.	Name of the Author/s	Title of Paper	Name of Journal
1.	Jobin K. Antony, Binet Rose Devassy	Histopathological image classification using CNN with squeeze and excitation networks based on hybrid squeezing	Springer Nature 2023, Signal, Image and Video Processing
2.	Bonifus P.L., Thomas A.M., Antony J.K.	Optimisation of FPGA-Based Designs for Convolutional Neural Networks.	Springer, Singapore

Staff Paper Presentation

Sl No.	Name of the Author/s	Title of Paper	Name of Conference
1.	Ms. Deepthy G.S.	Design and Analysis of Slot Loaded Microstrip Antenna for Breast Cancer Detection	IEEE sponsored Second International Conference on Electrical, Electronics, Information and Communication Technologies (ICEEICT 2023)

Student Paper Presentation

Sl No.	Name of the Author/s	Title of Paper	Name of Conference
1.	Mr. Adithya S.M.	A Machine Learning Approach to Self-Adjust Optimal Air Conditioning Temperature Using Differential Air Velocity	7th International Conference on Emerging Trends in Engineering, Science and Technology (ICETEST2023).

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Project Expo – S8ECE

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In association with Electronauts, Department of ECE conducted an exhibition of the 8th Semester ECE student projects, for the S4 and S6 ECE students on 25th May 2023.The expo provided students an insight into the latest technologies and advancements in the field of Electronics and Communication Engineering.

Faculty Coordinators: Ms. Shyama Sreekumar, Ms. Mariya Vincent

1st Prize (Cash Prize of Rs. 3000/-)

AUTONOMOUS INDOOR DELIVERY ROBOT

Jerin Peter, Gokulkrishna S, Kiran C C, K Sivasankar

2nd Prize (Cash prize of Rs. 2000/-)

VEIN ILLUMINARION USING NIR SPECTROSCOPY

M Abhishek, George Shibu Myalil, Hariprasad J, H Kalidas

3rd Prize (Cash Prize of Rs. 1000/-)

DEEP LEARNING BASED SLEEP ANALYSIS & QUALITY TRACKER

Adithya S M, Abhinand P, Athul George, Allen Loy

Consolation Prizes (Certificate of Appreciation)

a. SPECTROSCOPIC FOOD QUALITY ANALYSIS

Richu Pramod, T S Alwin, Samuel Georgy, Savio Johnson

b. IMPLEMENTATION OF LEAF DISEASE DETECTION ON EDGE DEVICE

Nabeela Najam, Navya K George, Sona Varghese, Srimol K S

c. DESIGN OF HARDWARE SECURITY PUF CIRCUIT RESISTANT TO ML ATTACKS

Navaneeth T V, Sriram N, Vaishnav Praveen, Sandra Santhosh Mathai

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Electronauts, association of Department of ECE organized the event "Parudeesa", for the S8 ECE students on 26th May 2023. This event is to give students an opportunity to recollect memories at RSET.

Faculty Coordinators: Ms. Shyama Sreekumar, Ms. Mariya Vincent

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Student Activities

Winners of the JAM Competition:

In celebration of English Language Day, the Discipline of English, Department of Basic Sciences & Humanities, organized a 'Just A Minute' (JAM) competition on May 5th, 2023. The competition saw enthusiastic participation from students across various departments, including the Department of Electronics and Communication Engineering (ECE). The winners from the ECE department are as follows:

1st Position: Krishnanand Prajith Menon (S2 EC - Beta)

2nd Position - Nanditha Sajeev (S2 EC - Gamma)

Participation in KTU Athletics Meet, Trivandrum:

1. Sathyajith S (S4 ECE Gamma)

2. Amit Anand (S6 ECE Alpha)

3. Chrisdha Roy (S6 ECE Alpha)

4. Rohan Nair (S4 ECE Gamma)

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Student Activities

The Winners of the **Wall Magazine Competition** conducted by the Department of Basic Sciences and Humanities for First Year Students

Second position for ECE Alpha: Wall Magazine Competition

Third position for S1 ECE Gamma: Wall Magazine Competition

Second position: The team received a cash prize of ₹2000 and certificates
Third position: The team received a cash prize of ₹1000 and certificates