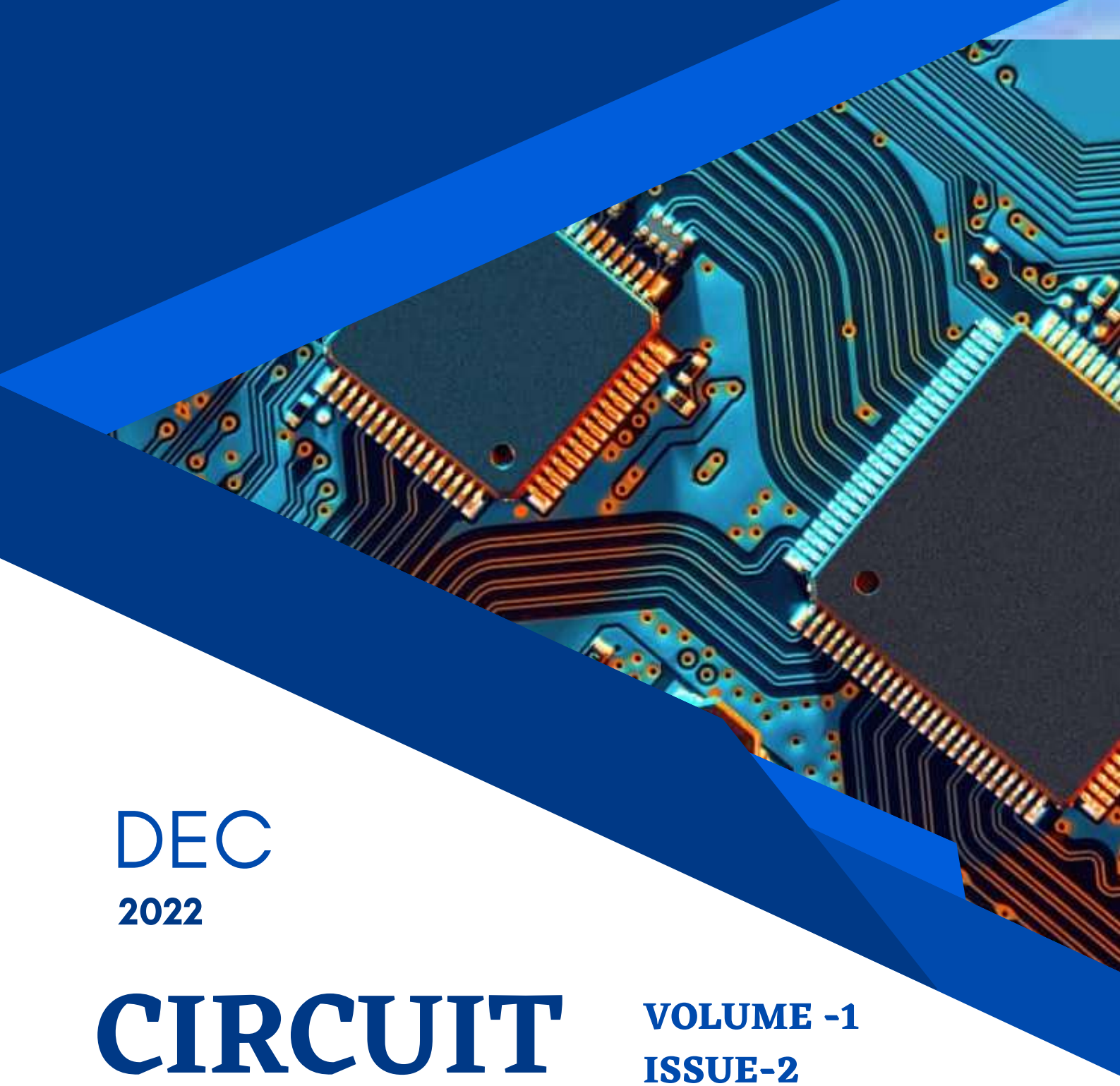


DEC
2022

CIRCUIT TIMES

VOLUME -1
ISSUE-2

SVCE | SRI VENKATESWARA COLLEGE OF ENGINEERING

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

IN THIS ISSUE :

ARTICLE

- BY FACULTY
- BY STUDENT

FACULTY PARTICIPATION

ACHIEVEMENTS

- BY FACULTY
- BY UG STUDENTS

VISION OF THE DEPARTMENT

To excel in offering value based quality education in the field of Electronics and Communication Engineering, keeping in pace with the latest developments in technology through exemplary research, to raise the intellectual competence to match global standards and to make significant contributions to the society.

MISSION OF THE DEPARTMENT

- To provide the best pedagogical atmosphere of highest quality through modern infrastructure, latest knowledge and cutting edge skills.
- To fulfill the research interests of faculty and students by promoting and sustaining in house research facilities so as to obtain the reputed publications and patents.
- To educate our students, the ethical and moral values, integrity, leadership and other quality aspects to cater to the growing need for values in the society.

Program Educational Objectives (PEOs)

PEO1: Create value to organizations as an EMPLOYEE at various levels, by improving the systems and processes using appropriate methods and tools learnt from the programme.

PEO2:Run an organization successfully with good social responsibility as an ENTREPRENEUR, making use of the knowledge and skills acquired from the programme.

PEO3:Contribute to the future by fostering research in the chosen area as an ERUDITE SCHOLAR, based on the motivation derived from the programme.

Program Specific Outcomes (PSOs)

PSO-1: An ability to apply the concepts of Electronics, Communications, Signal processing, VLSI, Control systems etc., in the design and implementation of application oriented engineering systems.

PSO-2: An ability to solve complex Electronics and communication Engineering problems, using latest hardware and software tools, along with analytical and managerial skills to arrive appropriate solutions, either independently or in team.

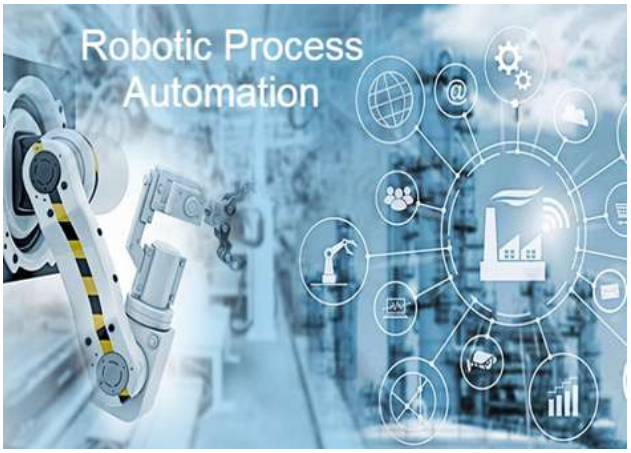
ARTICLE

ROBOTIC PROCESS AUTOMATION

Dr. N.Kumaratharan, Professor, ECE

I INTRODUCTION

Robotic process automation is an application of artificial intelligence that configures a robot (software application) to interpret, communicate and analyze data. This discipline of artificial intelligence helps to automate partially or fully manual operations that are repetitive and rule-based.



Robotic - Machines that can enact human actions on a business system (hence called a robot)

Process - A sequence of steps when followed completes an assigned business task

Automation - Something which can be done by a machine than an individual to save time and also at the same time be effective and efficient.

I

Figure 1: RPA

RPA allows the automation of repetitive office or business activities. Business "bots" are a digital business process equivalent of robots found on the manufacturer's assembly line. This allows to direct multiple applications and systems quickly and precisely, while the "bots" execute the required processes. Using RPA tools, a company can configure software, or a "robot", to interact with applications for processing a transaction, manipulating data and communicating with other digital systems.

Value of RPA offer to a company:
RPA provides organizations with the ability to reduce personnel costs and human error. Bots are generally cheap and easy to deploy, requiring no custom software or deep systems integration.

II TYPES OF ROBOTIC PROCESS AUTOMATION

- **Attended Automation:** These tools will require human intervention while performing automation processes.
- **Unattended Automation:** These tools are intelligent and have decision-making capabilities.
- **Hybrid RPA:** These tools will have combined capabilities of both attended and unattended automation tools.

III ROBOTIC PROCESS AUTOMATION TOOLS

RPA tools are the software through which the user can configure tasks to get automated. These are widely used tools in the industry for distinct purposes and have their pros and cons.
The primary RPA tools are as follows:

- Blue Prism
- UiPath
- Automation Anywhere
- WorkFusion
- Pega Systems

The RPA tool trio is the leader in the market (Blue Prism, Automation Anywhere, and UiPath)

IV ROBOTIC PROCESS AUTOMATION OPERATIONS:

Kristina Romero and his technical team from M/s. InfoCap Networks LLC (InfoCap), San Diego, propose a sample of Robotic Process Automation operations as given in figure 2. This technological model will replace the entire business system operations by automating manual work, more into human intensive, time consuming, specifically error prone content enabled business. In this sense, the main advantage is the "Digital Labour" to reduce costs, minimize errors, and eliminate the risks. The RPA has many operational advantages across multidisciplinary and varied organizations.

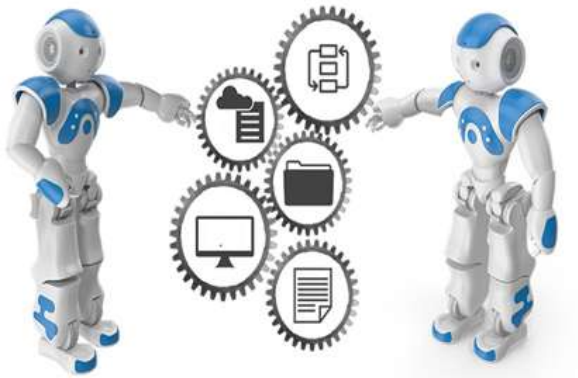


Figure 2 RPA Operations- Kristina Romero

Credible Business Transformation: With the new RPA technology, the business operations are going to be changed drastically. The companies can now dramatically improve the efficiency with which they use their labor, augmenting a more sustainable workforce with reliable, efficient and low-cost digital labor using Robotic Process Automation. This allows companies to reduce costs, minimize errors, and eliminate risk.

Content Migrations: A huge amount of content is generating in all the organizations. Manpower may be required to collect, analyze, and generate a report as insights is becoming complex in routine operations. Robotic Process Automation can only help the organizations and business companies to accelerate application consolidation and legacy application integration by migrating content or connecting to legacy systems more rapidly, with less effort.

Web Crawling / OSINT: Robotic Process Automation automates the capture of content in any format from any source through various devices. The formats may be in text, picture, audio, video. The data can be the structured, semi-structured and unstructured format. This Robotic Process Automation technology is capable of harvesting deep web data via deep learning techniques.

Moreover, with the help of Artificial Intelligence, Big Data Analytics, and other web analytics, the mining process will have done.

IT Department Enabler: In their blog, they mentioned that the "Robots" in the Robotic Process Automation "Software programs that mimic human-computer interactions and execute a repetitive process, rules-based tasks like gathering and comparing data from multiple systems, reading and writing to databases, or extracting and reformatting data into reports and dashboards". They keep on the eye in hardware and software and networking monitoring for resolving deviations and smooth operations.

V RPA-OPERATING MODEL DESIGN

Robotic Process Automation is an emerging form of business process automation technology based on the notion of software robots or artificial intelligence workers. Rodger Howell and Tom Torlone in their seminal article insisting the growth of Robotic Process Automation technology. They rightly pointed out that the Robotic Process Automation is coming in reality from pilot projects. Hence the organizations need to define their own RPA models to increase the operational efficiency and reduce the cost.

These authors mean to say that the RPA operational models vary from companies to companies and industry to industry. In their opinion, the Robotic Process Automation operating models are not "one-size-fits-all". However, an effective RPA operating model is largely cantered around three key roles.

Process Architects

Who help design future state processes empowered by Robotic Process Automation. The process is nothing but task completion. It is associated with many factors of software like Interactive Voice Response, hardware like robots, few human interventions. There are different types of the process including of long-term and short-term process/round robin, priority / First Come First Served Process (FCFS) / Last In First Out (LIFO). The process architects are responsible for defining all these processes in both the centralized process and decentralized process systems. First, they have to understand the existing system flow, identify the loopholes in the system components, tasks handling, time requirements, and cost reductions along with systems efficiency. In one way the business analysts are also responsible for process automation. The process architects design the consistent methodology, process, and standards of Robotic Process Automation system.

Technologists

Who develop the code that translates the business logic into a robotic workflow? We know that a technologist is a scientist or an engineer who specializes in a particular technology, or who uses technology in a particular field. In the market right now the companies are having more. These are the coders, programmers, they take the input from functionalist and designers, executors and develop the code based on the Software Requirement Specifications (SRS). All these coded software is able to help the routine work handling automatically without human interventions at a certain level. The authors also point out that a Robotic Process Automation Centre of Excellence will usually put a team of dedicated developers in a low-cost location to scale a Robotic Process Automation program. The technical skills required for RPA tools are relatively less sophisticated compared to traditional application development.

Ongoing Support and Maintenance Staff

Who execute newly automated tasks and make updates to the code when required? This process happens generally through annual maintenance contract (AMC) with the software vendor or supplier.

They easily debug the errors if any fault and failure in the system software and applications. They give technical support 24x7 round the year if AMC is valid. This kind of technical support really reduces the in-house technical people recruitments cost and time. There would not be any training cost also. The ongoing support packages from the companies are tailored to suit the needs of customer business, not the needs of the many. Whether customer need assistance with an individual problem or weekly reviews and advice have the package to suit customer's needs, giving customer total peace of mind.

VI RPA BENEFITS

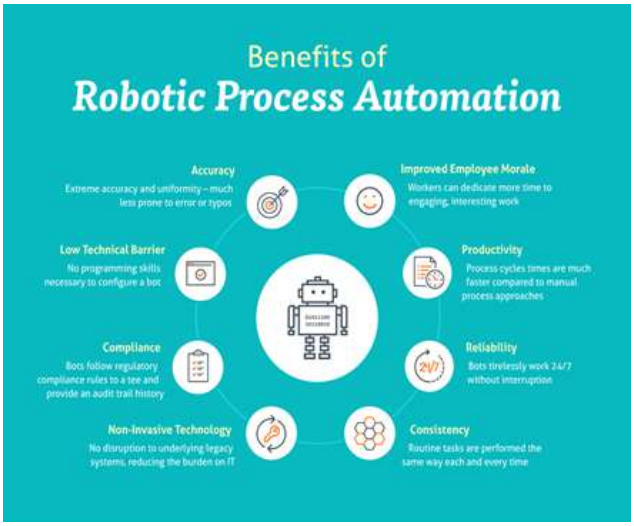


Figure 3 RPA Benefits

The following are the advantages of RPA:

- Building a unified customer view
- Increased employee productivity
- More accuracy and quality
- Increased customer satisfaction
- Cost-effective
- Up to 80% reduction in AHT (Average Handle Time)
- Up to 90% reduction in ART (Average Resolution Time).

VII APPLICATIONS OF RPA

Most leading global companies such as Accenture, Deloitte, Capgemini, and many more use Robotic Process Automation in their day-to-day tasks. These companies benefit from using RPA as it provides reliable, accurate, and consistent outputs with high productivity rates.

The significant areas benefiting through RPA are as follows:

- Healthcare: All hospitals make use of RPA for patient registration and billing purposes.
- HR: Many industries use RPA for HR activities like new employee joining formalities, payroll process, and hiring shortlisted candidates.
- Insurance: To claim processing and clearance of premium information.
- Manufacturing & Retail: Bills of material and calculation of sales.

- Telecom: Service order management and quality reporting.
- Travel & Logistic: Ticket bookings, passenger details, and accounting.
- Banking and Financial Services: Cards activation, fraud claims, and discovery.
- Government: Change of address and license renewal activities are made easy.
- Infrastructure: Issues in processing account setup and communication.

VIII CONCLUSION

RPA utilization is gradually increasing in the market around the globe. Most of the enterprises have already started implementing the RPA technology, as it is cost-effective, optimizes the usage of other resources, and is less prone to errors.

Today, most enterprises are using RPA tools for testing a specific application because the old testing tools have certain limitations. For example, the Selenium testing tool: It is an automation tool to test web browsers, but it is limited to a single browser. If we have to test another part of the application, Selenium has to be integrated with other tools. But, using RPA, any part of the system can be tested with a single tool.

In the near future, the RPA tools may get sophisticated and take over the characteristics of business process management tools along with AI tools. They may become more efficient in such a way that they could analyse the statement of a particular customer request and recommend any discount if applicable.

IX FUTURE SCOPE OF RPA

In the next few years, automation will redefine itself to step into the next level of digital transformation. It will deliver a new level of customer satisfaction through higher quality experience, in-depth personalization, and faster product delivery offerings with great convenience. Some of the major RPA predictions that are set to redefine digital transformation in the years to come are as follows.

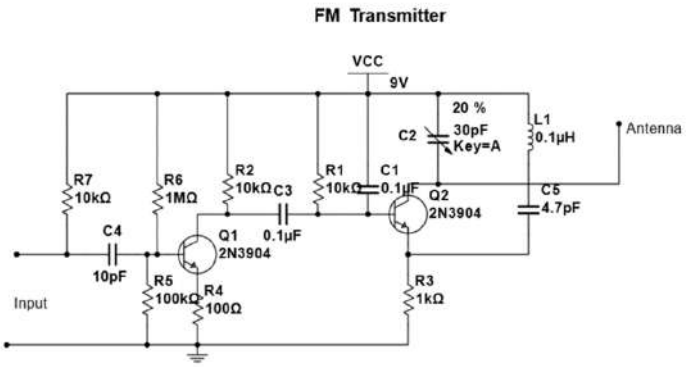
- Advancement in Artificial Intelligence (AI) will slowly merge with RPA to deliver integrated business value.
- Consumers using a conversational interface (CI) continues to grow.
- Chatbots are going to be the next target for RPA.
- In the near future, we can witness voice-enabled products become criteria in the industry.

Defence Frequency Detector

Ms.S.Sahana B, III Year ECE

Defense communication is essential in light of current advancements in telecommunications technology. The goal of this is to make army communication safer. One cannot anticipate robust networking in the places where the army is stationed. Additionally, these channels are more prone to intruders. A novel inaudible frequency elucidation method is proposed to mitigate this problem. In this case, a standard transmitter is used to generate and transmit extremely high inaudible frequency. It is ensured that the frequency is safe for animals to hear and is not their audible range. To find that frequency, a suitable receiver is designed.

The frequency is to be kept completely confidential and only be known to the Indian army. In this manner, neither the frequency nor its importance will be known to the adversary. While not requiring internet or WiFi, this technique works similarly to a GPS. There are numerous further applications for this technology. In the case of a hostage, communication between the hostage and the soldiers was the key issue. The army took a while to determine who was a hostage and who was an opponent. In this situation, it will be straightforward for the army to interfere if the Indian national being held emits a distinctive frequency from his or her phone. Consequently, the main purpose of this work is to ensure the security of the Indian army and its citizens.



FACULTY PARTICIPATION

- Dr.S.Muthukumar, HoD/ECE attended an Elite Academia - Industry Consortium Empowered through Simulation Event conducted by CADFEM India, Elite Channel Partner of ANSYS in association with IIT Madras Pravartak and ANSYS on 1st of December, 2022 between 5:30 PM and 8:30 PM at Le Royal Meridien, Chennai.

Dr. S.Muthukumar and Dr. Badrinathan at the event.

- Ms.C.Gomatheeswari Preethika, AP, ECE attended the three days Faculty Development Program by Teaching Learning Centre, IITM conducted from 01/12/2022 to 03/12/2022 in online mode.

- G.A.Sathish Kumar, Professor, Mr.S.P.Sivagnanasubramanian, Mr.S.Senthil Rajan, Ms.L.Anju and Ms.K.S.Subhashini AP, attended National Level FDP on “Research Challenge in AI and Robotics” from 27th December 2022 to 29th December 2022 organized by Department of ECE, Sri Krishna College of Engineering and Technology Coimbatore.

- Dr.T.J.Jeyaprabha, Associate Professor and Ms. R. Kousalya, AP, attended 2 weeks STTP on "Connecting People to the Semiconductor Industry" from 5th Dec 2022 to 17th Dec 2022 organized by the Department of ECE, SRM Institute of Science and Technology.

- Dr, S.R.Malathi, Professor, and Ms. R. Kousalya, AP, attended the International Workshop on "PLC and Automation" organized by the Department of Mechanical Engineering, SVCE from 27.12.2022 to 28.12.2022.

- Dr.S.Vijayanand, AP, attended the Webinar on Machine Learning in Wireless Communication: 5G and Beyond delivered by Dr.Vaibhav Hendre, Deputy Director and Professor, Electronics and Telecommunication Engineering, G. H. Raisoni College of Engineering and Management organized by IETE Chennai Centre on 09.12.2022.

- Mr.S.Senthil Rajan, Ms.S.M.Mehzabeen, and Dr.S.Vijayanand AP, participated in Five Days International Level online Faculty Development Programme on Emerging Research Advancements in Intelligent Computing Technologies from 19th December 2022 to 23rd December 2022, Organized by the Department of ECE, Sri Krishna College of Engineering and Technology, Coimbatore-641008.

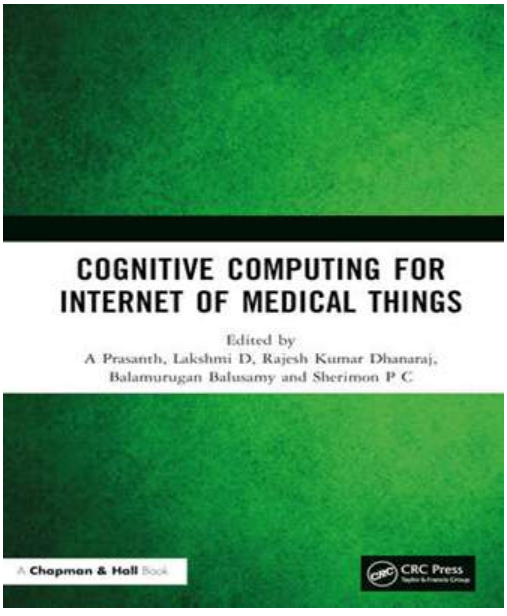
- Mr.S.Senthil Rajan, Assistant Professor, ECE participated in the webinar series on “Advancements in Antenna Design Techniques” organized by the Department of Electronics and Communication Engineering, SSN College of Engineering from 05th - 09th December 2022.

- Mr.S.P.Sivagnana subramanian, Assistant Professor, ECE participated in one week Professional Development Programme on “Teaching Learning Process and Outcome Based Education” from 12/12/2022 to 16/12/2022, Organized by Vels Institute of Science, Technology & Advanced Studies, Chennai.

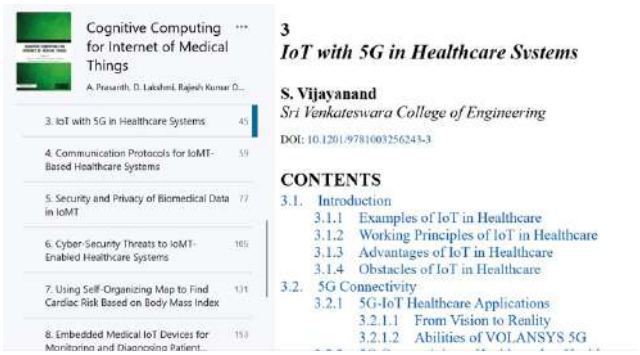
ACHIEVEMENTS

BY FACULTY

- Dr.A. Prasanth, AP edited the book titled "Cognitive Computing for Internet of Medical Things" (IoMT) offers a complete assessment of the present scenario, role, challenges, technologies, and impact of IoMT-enabled smart healthcare systems. It contains chapters discussing various biomedical applications under the umbrella of the IoMT.



- Dr. S. Vijayanand, AP authored a chapter titled "IoT with 5G in Healthcare Systems" to the book Cognitive Computing for Internet of Medical Things (IoMT).



The following are the faculty publication during December 2022.

Dr.A. Prasanth, "Feature Selection and Dwarf Mongoose Optimization Enabled Deep Learning for Heart Disease Detection", Computational Intelligence and Neuroscience, December 2022. Impact Factor: 3.2, Indexed by SCI, Web of Science, Scopus Published Link: https://www.hindawi.com/journals/cin/2022/2819378/

ACHIEVEMENTS

BY FACULTY

- Dr P.Jothilakshmi, Professor and Ms. C.Gomatheeswari Preethika, AP, filed A Design Patent titled "Agriculture Drone for Monitoring and Spraying Pesticides" on 15.12.2022.

BY UG STUDENTS

- The following ECE students of II year attended Startup Loan awareness Campaign for Entrepreneurs Conducted by District Industries Center,Kanchipuram on 21/12/2022.. Mr.Kalaiarasan S, Ms.Jeevalatha, Mr.Nandhanan.R, Ms. Selva bharathi.T.P, Mr.Udhayakrishn.V, Mr.Sathish.A

- Mr. Nirmal Kumar T K, III year ECE attended the RESIDENTIAL STUDENT WORKSHOP @ IIT Madras from DEC 12 – DEC 14 2022.

List of activities covered during the program

- RSW 22-23 Inauguration by Prof. V Kamakoti, IITM Director
- Out of Box Thinking
- Case Analysis for Innovation
- Think Like an Engineer
- Presentation Tips
- Biomimicry
- Mini Problem-solving projects where the students have to make a prototype to solve the problem.
- Lab visits / demos - by IIT faculty/research scholars.
- Learnings of Life - appreciating creativity through various mediums and process management
- Valediction- Chief Guest – Prof. Mahesh, Dean (Alumni & Corporate Relations), Certificate Distribution

EDITORIAL BOARD:

CHIEF EDITOR

Dr.S.MUTHUKUMAR

HOD/ECE

CO-EDITORS

Ms.C.GOMATHEESWARI PREETHIKA

Mr.S.ELANGOVAN

ASSISTANT PROFESSOR, ECE

STUDENT EDITORS

Mr. V.S.PRITHIVIRAJ - III Year ECE

Programme Offered By Department of Electronics and Communication Engineering

- B.E – Electronics and Communication Engineering
- M.E – Communication Systems
- Ph.D / MS (by Research)

Approved as a research center by Anna University, Chennai. (More than 48 Scholars doing their doctoral studies through our research center)

TOP RECRUITERS