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Sri Venkateswara College of Engineering

CIRCUIT TIMES

INSIGHTS

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- Faculty Participation
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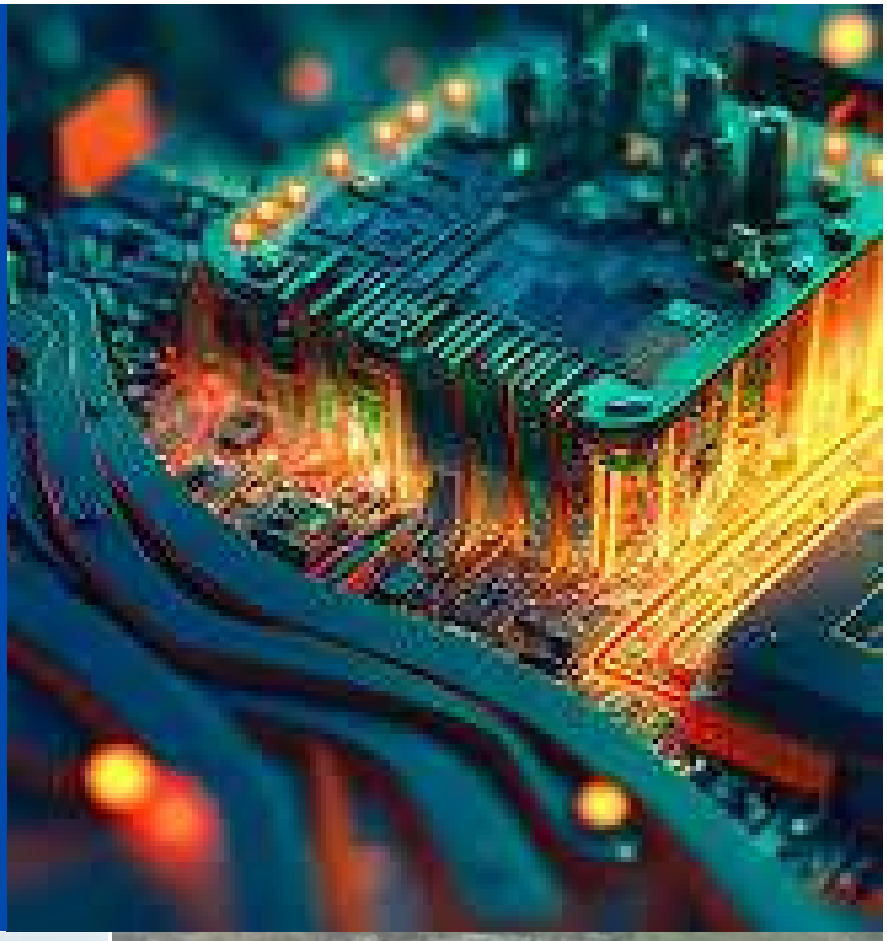

VISION OF DEPARTMENT

To lead the future of Electronics and Communication Engineering, through developing accomplished people, transformative research, distinguished academics, developing break-through innovations and sustainable solutions to serve society at the national and global level.

MISSION OF DEPARTMENT

By fostering a culture of continuous learning and knowledge acquisition in electronics and communication engineering through rigorous academic programs, research opportunities, industry collaborations, with provision of necessary resources and support.

By nurturing an environment that empowers learners to progress and reach their full potential, contributing to the advancement of Electronics and Communication Engineering and prosper in their careers.

By contributing to society through innovative and sustainable engineering solutions to tackle national and global issues, thereby enhancing the quality of lives and communities.

FACULTY ARTICLE

MAGNETIC RESONANCE IMAGING TECHNIQUES–AN OVERVIEW

Mrs.S.Mary Cynthia,
Assistant Professor, Department of Electronics and Communication Engineering,
Sri Venkateswara College of Engineering (Autonomous), Sriperumbudur

ABSTRACT:

Magnetic Resonance Imaging (MRI) is widely used in biomedical research and clinical applications. The emergence of new techniques increases the applications of MR imaging remarkably. MRI is established with the use of Magnetization properties and RF signal for generating images of organs to diagnose diseases. In this paper the types Magnetic Resonance Images and their several applications were explained and it gives the significance of different MRI images in Medical Field. In general the value of MRI is affected by some factors like the availability of experts, number of scanners and cost. The MRI Scanning Process is comparatively more secure than other methods like X-ray CT and PET in terms of ionization.

1.INTRODUCTION

To capture MRI a strong magnetic field is applied to randomly oriented protons of human body available in water molecules to make changes in the alignment. Then this magnetization is disordered by applying external Radio frequency wave. This absorbed RF energy is then emitted with the help of several relaxation processes and the protons realigned. Subsequently the emitted signals are determined.

The frequency information present in the emitted signal for each location then converted into corresponding intensity levels. By changing the cycle of RF pulses enforced and acquired different MRI images can be constructed. The value of time required between two applied pulses is called Repetition Time (TR) and the value of time between the distribution of RF pulse and the collection of the echo signal is called Time to Echo (TE).

2. WEIGHTED IMAGES

2.1 T1-weighted images

T1 images indicate that the time required for the protons to realign with the direction of applied magnetic field which leads to short Time to Echo and Repetition time. Generally fat taking short time for the realignment compared with water so fat appears bright while water emerges dark. The T1 weighted image should contain short TR otherwise all protons appears with same intensity value. If the selected TR time is shorter than tissue's recovery time then only contrast images can be obtained.

2.2 T2-weighted images

The longer value of TE and TR times used in the development of T2-weighted images. The transverse relaxation time(T2) is defined as the value of time which required to give up phase adherence of protons.

2.3 Fluid Attenuated Inversion Recovery (FLAIR):

In which the value of TE and TR times selected such that very longer than T2 weighted image. So that CSF fluid is completely repressed and abnormalities appears bright which yields easy determination abnormalities. In FLAIR images grey matter occurs brighter than white matter as like T2 weighted images but Cerebra Spinal Fluid (CSF) appears dark.

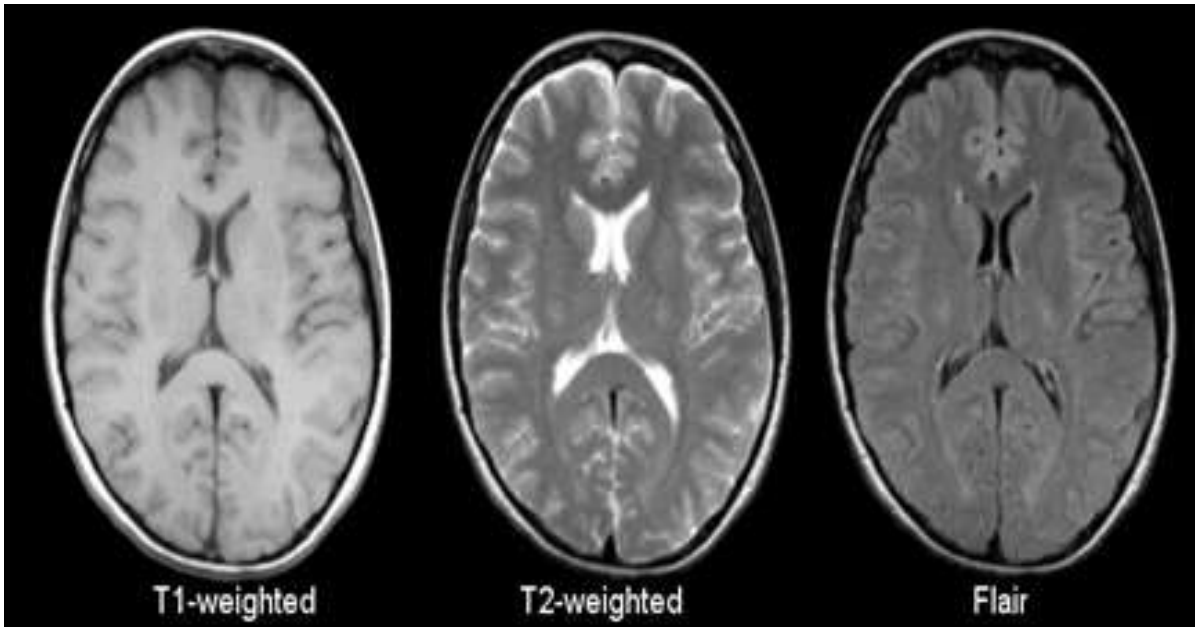

Fig.1.T1, T2-Weighted and FLAIR Magnetic resonance images

3.SPIN ECHO MAGNETIC RESONANCE IMAGING

The SEM image captured with the help of spin-echo pulse sequence consists of 90° excitation pulse and a 180° inversion or refocusing pulse. These pulses applied to the tissues present in the region of interest.

3.1 GRE (Gradient echo Imaging)

The GRE image is obtained with the use of gradient-echo sequences which are having flip-angle changing over a range of 10 to 80 degrees. If the flip angle value is large then it gives more T1weighting to the image and the value is small then it provides T2 weighting to the image.

3.2 Diffusion Tensor Imaging (DTI)

Diffusion Tensor Imaging (DTI) is a type of Magnetic Resonance Image which is based on the flow of water molecules present in the white matter of central nervous system (CNS). Since Diffusion Tensor Imaging provides the information about the structural connectivity of the brain white matter its demand is increased over the last two decades. Because of limited resolution and contrast the conventional MRI techniques were not able give information about axonal organization. But it is possible using DTI because it is primarily depends on the diffusion of water molecules its value is high in the axonal bundles compared to the normal direction so the axonal direction can be easily determined.

3.3 Functional Magnetic Resonance Imaging (FMRI)

The functional Magnetic Resonance Imaging technique is used to determine the minute changes in blood flow that happened during brain functions. It can predict anomaly brain functions which cannot be determined with other imaging modalities.

3.4 Diffusion kurtosis imaging (DKI)

In DTI images diffusion are based on Gaussian distribution only. If diffusion behavior is Non-Gaussian then DKI are used so that they are captured at multiple b values with multiple gradient orientations. The generally used performance metrics for DKI are mean kurtosis and axial and radial kurtosis.

4.HIGH ANGULAR RESOLUTION DIFFUSION IMAGING (HARDI)

- In White Matter the diffusion is anisotropic and WM injury detection is challenging one because of crossing and kissing fibers.
- HARDI data having ability to resolve cross fibers and it is typically very useful in the case of complex tract arrangement of brain.
- But the main disadvantage of DKI and HARDI method is scanning time is large.

4.1 Susceptibility Weighted Imaging (SWI)

Susceptibility weighted imaging is a newly developed neuro imaging technique which uses magnitude and phase images. It is used to detect components having paramagnetic, diamagnetic, and ferromagnetic properties like blood products, iron and calcium.

These components couldn't find using conventional MRI. Also SWI having the ability to discriminate calcium from haemorrhage. It is very essential for traumatic brain injury patients to classify their severity.

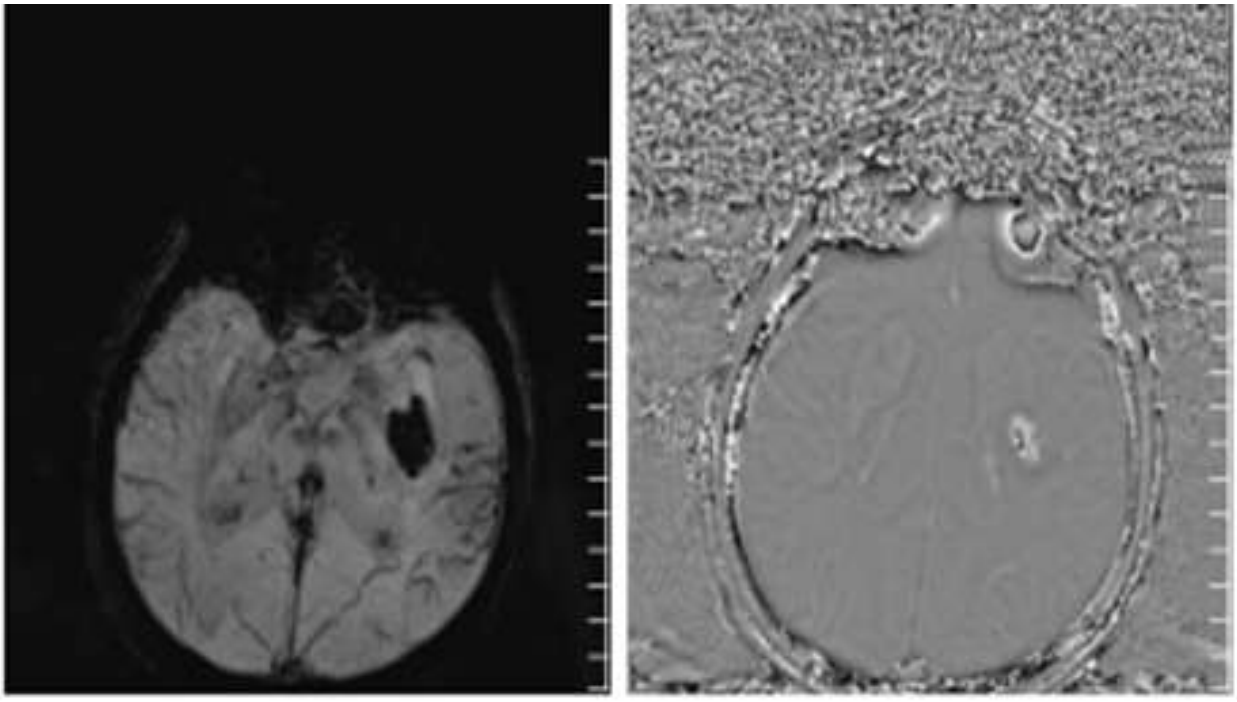

Fig.2.SWI Magnitude and phase image

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FACULTY PARTICIPATION

(SEMINAR/FDP/STTP/WORKSHOP/ONLINE COURSE/CONFERENCE)

- **Dr.T.J.Jeyaprabha** attended **five days Faculty Industrial Training and Internship** on **"AR and VR with emphasis in Unity Engine" organized by TANSAM, Chennai** from 02.12.2024 to 06.12.2024.
- **Dr.D.Menaka** attended **six days AICTE sponsored ATAL FDP** on **"Integrating Machine Learning & Deep Learning in real time IoT systems"** in association with **NVIDIA systems** organized by Saveetha Engineering College (Autonomous), Chennai from 02.12.2024 to 07.12.2024.
- **Mr.S.P.Sivagnana subramanian** attended **five days Faculty Industrial Training and Internship** on **"Robotics and Automation"** organized by **TANSAM, Chennai** from 09.12.2024 to 13.12.2024.
- **Dr.N.Kumaratharan, Dr.D.Menaka, Dr.T.J.Jeyaprabha, Mrs.L.Anju** and **Mrs.S.M.Mehzabeen** participated in **six days online ATAL FDP** titled, **"IOT in Healthcare: Transforming Patient Care and Management"** organized by Department of Electronics and Communication Engineering, Sri Venkateswara College of Engineering (Autonomous), Sriperumbudur from 09.12.2024 to 14.12.2024.
- **Dr.S.R.Malathi, Mrs.B.Sarala, Mrs.K.Bhuvaneswari** and **Mrs.M.Stella Mercy** participated in **six days AICTE Training And Learning (ATAL) Academy Faculty Development Program** on **"Advanced Semiconductor Devices and AI Chips-Research Opportunities and Challenges"** organized by Department of Electrical and Electronics Engineering, Sri Venkateswara College of Engineering from 16.12.2024 to 21.12.2024.
- **Mrs.B.Sarala** participated in **two days workshop** on **"Machine learning with Data Analytics"** organized by **Pantech E-learning Private Limited** from 27.11.2024 to 28.11.2024.

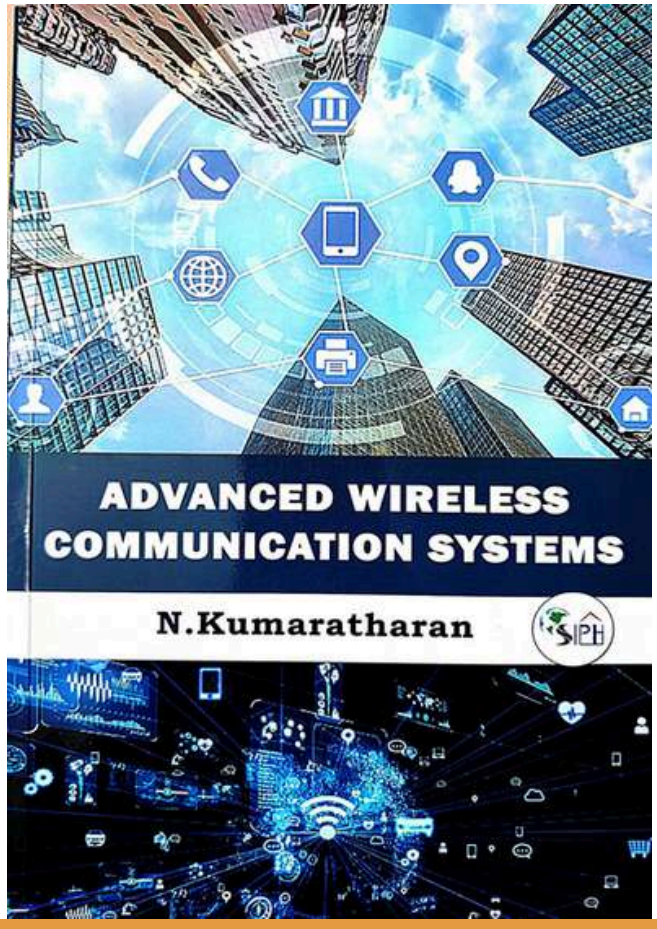
FACULTY PUBLICATION

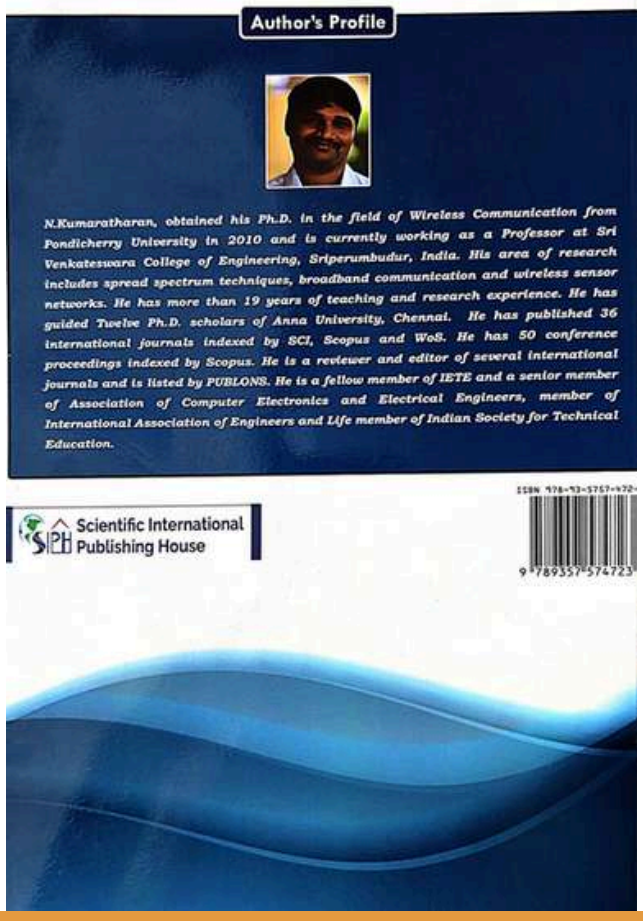
- **Mr.V.P.Sreekantha Kumar** and **Dr.N.Kumaratharan,** published a paper tilted **"Achieving optimal data collection efficiency with dynamic levy flight- enabled PSO in mobile sink based WSNs"** in the journal of **Telecommunication Systems,** Vol. 87, No.4, pp. 937-959, 2024.

FACULTY ACHIEVEMENTS

- **Mrs.B.Sarala** received **NPTEL Discipline star award** from **NPTEL-Swayam** during the **academic year (July-November 2024)**

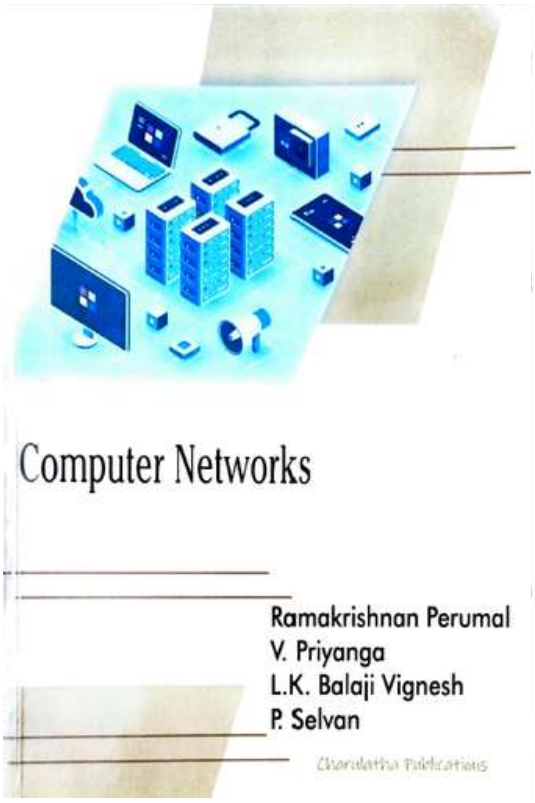
- **Dr.N.Kumaratharan** authored a book titled, **"Advanced Wireless Communication Systems"**, published by **Scientific International Publishing House** with **ISBN: 978-93-5757-472-3**

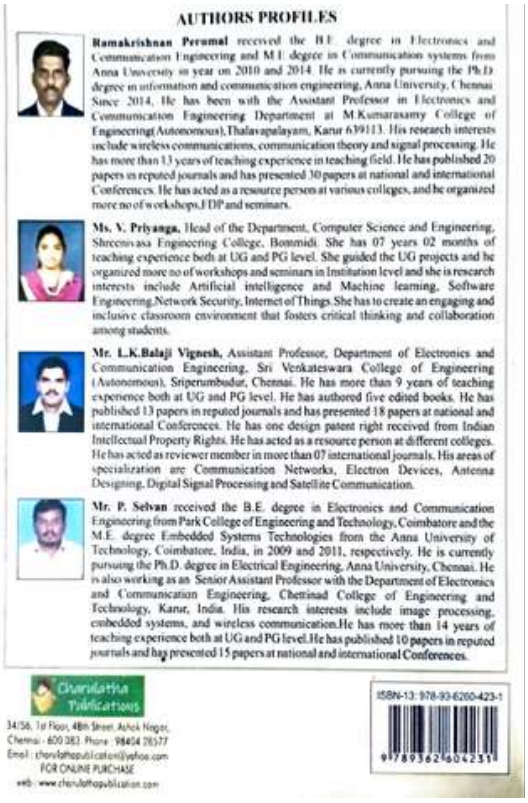




FACULTY ACHIEVEMENTS

- Mr.Ramakrishnan Perumal, Ms.V.Priyanga, **Mr.L.K.Balaji Vignesh,** Mr.P.Selvan authored a book titled, **"Computer Networks",** published by **Charulatha Publications** with **ISBN No: 978-93-6260-423-1**

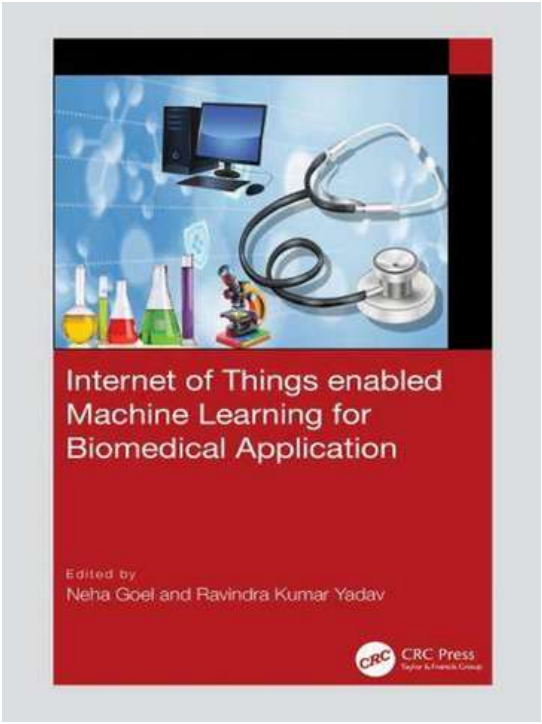


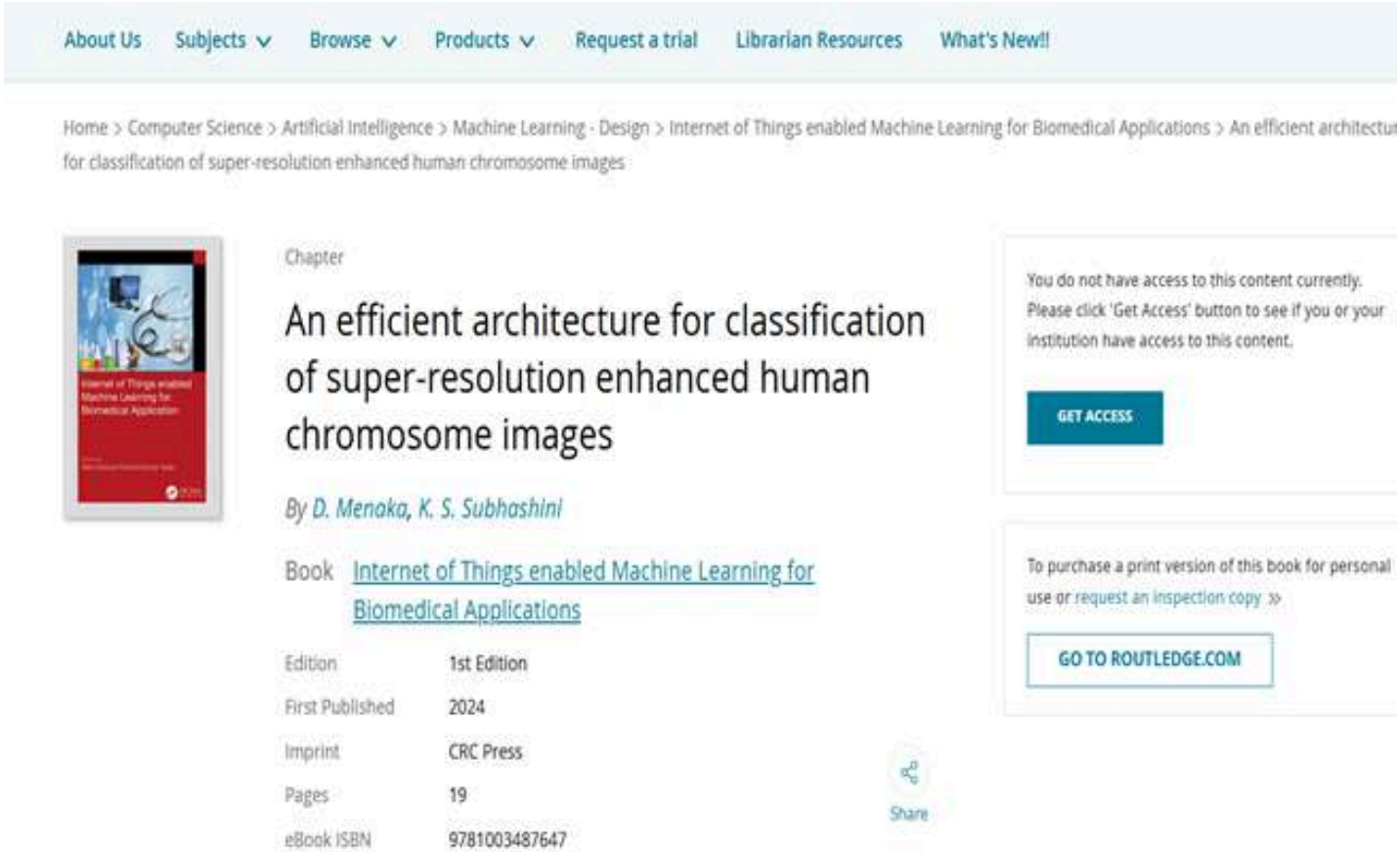


- **Dr.R.Gayathri, Mrs.S.M.Mehzabeen, Mrs.G.Akila, Mr.J.Tamilselvan, Mrs.Tanaya Kanungo** published a **design patent** titled, **"Artificial Intelligence Based Nerve Activation Device for Healthcare Treatment (Patent No. 433205-001; DoG: 06/DEC/2024)**

FACULTY ACHIEVEMENTS

- **Dr.D.Menaka** and **Mrs.K.S.Subhashini** has published a book chapter titled **"An Efficient Architecture for Classification of Super-Resolution Enhanced Human Chromosome Images"** in the book of **"Internet of Things Enabled Machine Learning for Biomedical Applications"** published by **CRC press, Taylor and Francis group (Scopus Indexed)**





STUDENT ACHIEVEMENTS

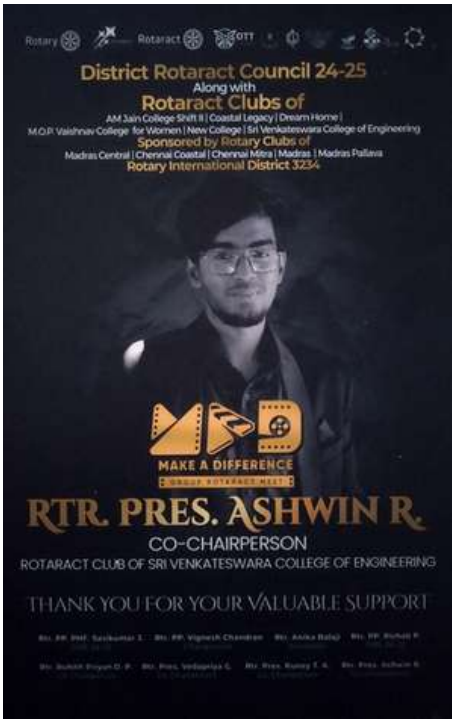
(Co-curricular Activities/Extra-curricular Activities)

- The student team **Traceroute_24** from SVCE won the **first prize (₹1 Lakh)** at the **Smart India Hackathon 2024-Hardware Edition** for solving a problem statement from the **Ministry of Culture**. The event was held at **Manipal University, Jaipur.** The team excel in a 120-hour challenge of innovation and teamwork. The team comprised **Ms.K.Leena, Mr.M.Ramanthan, Ms.T.Renukadevi, Ms.K.Tanushri (III Year ECE)** and **Mr.R.M.Manikandan (IV Year ECE)** under the mentorship of **Mrs.L.Anju and Ms. K. S. Subhashini, AP/ECE, SVCE.**

STUDENT ACHIEVEMENTS

(Co-curricular Activities/Extra-curricular Activities)

- **Third Year ECE Students** (Mr.R.Ashwin, Ms.B.Amrutha, Mr.R.S.Aditya Vardan, Mr.G.Akshay, Ms.Anjana Suresh, Ms. R.Dhanusuya) **and Second Year ECE Students** (Mr.M.Abishek, Mr.K.K.Arjun Sathish, Ms.S.Harini, Mr.S.K.Harshinivarsa, Ms.S.Shree Dharshan, Mr.P.Vishnn**u)** participated in **various events (Best Presentation, Best Group and Best Cultural Presentation)** organized by **"Group Rotaract Meet-Half Yearly Presentation Event"** conducted on 22.12..2024.



EVENTS ORGANIZED

- The **Department of Electronics and Communication Engineering** organized an **AICTE-sponsored Online Faculty Development Program (FDP)** on the topic of **"IoT in Healthcare: Transforming Patient Care and Management"** from **09.12.2024 to 14.12.2024** with a **grant of Rs.1,00,000.** The program received 250 applications, out of which 239 participants were approved, and 209 actively attended. Esteemed speakers, including **Dr. Kavita Ganesh and Dr. Lakshmiha,** shared expertise on IoT applications in healthcare, smart hospitals, telemedicine and AI-driven diagnostics. Sessions explored critical areas like mental health solutions, genome sequence analysis, and patient engagement. The FDP equipped participants with cutting-edge tools and knowledge for innovative IoT solutions in healthcare. It provided a collaborative platform for learning and research, emphasizing practical applications and future trends in transforming patient care. The event was coordinated by **Dr.S. Vijayanand and Dr.R.Gayathri** ensuring its success and impact.

PLACEMENT ACTIVITIES

- **Final year students** attended the **Technical Training Program** organised by placement cell from 19.12.2024 to 28.12.2024.

ALUMNI TESTIMONIAL

Ms.Subha Gokulram,
Principal Consultant,
Ellucian, Florida, USA.

“I wouldn't want to take up too much as everyone else has probably described a lot. However what I would say is that every student has an equal chance for all extra/co-curricular activities. I was personally very fond of paper presentation and our Panorama culturals and have taken part in both and won competitions. Placement is another great support. Most of the students achieved fairly easier in SVCE than other colleges, including myself. In short, student life at SVCE is a memory filled with excitement, adventure and friendships that last a lifetime”**-Ms.Subha Gokulram, (Batch 1997-2001)**

PROGRAM OUTCOMES

PO1: Engineering Knowledge: Engineering Knowledge: Apply the knowledge of mathematics, science, engineering fundamentals and an engineering specialization to the solution of complex engineering problems.

PO2: Problem Analysis: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

PO3: Design / Development of solutions: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

PO4: Conduct investigations of complex problems: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

PROGRAM OUTCOMES

PO5: Modern tool usage: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

PO6: The engineer and society: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

PO7: Environment and sustainability: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

PO8: Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

PO9: Individual and team work: Function effectively as an individual and as a member or leader in diverse teams, and in multidisciplinary settings.

PROGRAM OUTCOMES

PO10: Communication: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

PO11: Project management and finance: Demonstrate knowledge and understanding of the engineering management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

PO12: Life-long learning: Recognize the need for, and have the preparation and ability to engage in independent and lifelong learning in the broadest context of technological change

PROGRAM EDUCATIONAL OBJECTIVES

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

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.

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PROGRAM OFFERED BY THE DEPARTMENT

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

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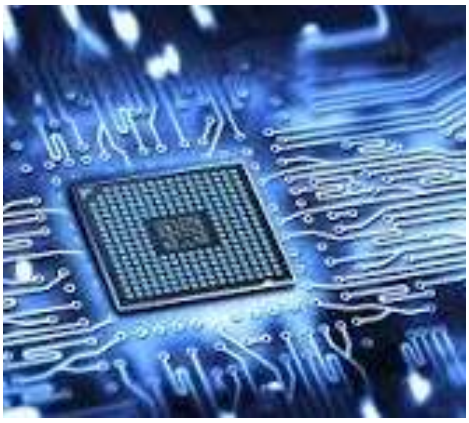
ELECTRONICS AND COMMUNICATION ENGINEERING

ABOUT THE DEPARTMENT

The Department of ECE was started in the year 1985 and is presently accredited by the NBA. The postgraduate program (M.E) in Communication Systems was started in 2002. There are about 38 faculty members in the department and 14 of them are doctorates. The department is well equipped with lab facilities and software tools like IE3D, ADS, CST Studio, Lab View, Tanner Tools, Cadence, MATLAB, and Prototype Machine.



SALIENT FEATURES OF ECE

- The Program has been accredited by the NBA since April 2002.
- Recognized by Anna University, Chennai as an approved research centre for Ph.D. and MS (by Research) with effect from May 2009.
- The major thrust areas of research are RF and Microwave Engineering, Wireless Networks, Network Security, VLSI, Cognitive Radio, Image & Signal Processing, Neural Networks & Soft Computing, Embedded Systems & IoT, Machine Learning, Nano Technology, Robotics, and Artificial Intelligence.
- The department is doing a good number of consultancy work in the field of PCB Prototyping and RF measurements using a Network Analyzer.
- On average over 75 companies visit our department for campus placements External Research grant of Rs 48.26 Lakhs received from ISRO and Cognizant Technology Solutions in the last five years for carrying out various projects.
- Students actively participate in research projects related to Wireless Communications, Networking, Embedded Systems & IoT, Virtual Reality, Robotics, Drones etc.
- Student Counselling Service at SVCE is committed one to promote the mental health and well-being of our students by providing accessible, quality mental health services.
- Student counsellors are available on campus for confidential counselling to all students.
- The department has signed over 12 MOUs with reputed companies to ensure the Industry Institute Interaction.
- Training programs are being conducted to enhance the employability skills of the students and also to achieve good placement in various Industries.

MESSAGE FROM HoD's DESK

The Department of ECE consistently does a commendable job in disseminating the latest knowledge and inviting specialists from diverse domains for discussions on the most recent advancement and trends besides conducting regular classes. We hope every student who visits our department has an engaging, motivating and positive experience. We consistently strive to ensure that instructors and other staff personnel possess the necessary abilities and knowledge to stimulate their students' intellectual curiosity, creativity and critical thinking. I hope you enjoy your time here and thoroughly use our amenities for promising career development

Dr. G.A. SATHISH KUMAR HoD/ECE

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SCAN & APPLY

CHOOSING SVCE: A PATHWAY TO SUCCESS AND GROWTH

- One of the prestigious and top ranked Autonomous engineering institution affiliated to Anna University, Chennai.
- Accredited by NAAC and NBA.
- Over 28 % of the alumni work abroad.
- Highest placement offers of Rs.25 LPA and 20 LPA in PayPal and Amazon.
- Highly qualified faculty and staff with an average experience of over 20 years.
- World class Laboratories to foster innovation and research.
- Alumni working in fortune 500 companies like Google, Microsoft, Facebook, Mercedes Benz, INTEL, etc.,
- State-of-the- art-campus with modern amenities in the industrial corridor of Chennai.

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A Bachelor's Degree in Electronics and Communication Engineering with expertise in one of the following specialization

HONOURS SPECIALIZATION

Wireless Communication Systems

VLSI

Antenna and Microwave Technology

Signal Processing and Data Science

IoT Systems and its Applications

Networking and Security

Our Recruiting Companies

accenture, amazon, Deloitte., Infosys, wipro, Ford, Cognizant, CATERPILLAR, SCHWING Stetter, FLSmidth, PayPal, verizon, SIEMENS, ASHOK LEYLAND, ABB, ThoughtWorks, Tech Mahindra, Atos Syntel, Capgemini, TCS 50, YAMAHA, TechnipFMC, HEXAWARE, freshworks, Informatica, vedanta, wood., SAINT-GOBAIN, HCL, HYUNDAI, Honeywell, TVS, flex., TEMENOS

Top Universities where our students are pursuing Higher Education

NANYANG TECHNOLOGICAL UNIVERSITY SINGAPORE, PennState Great Valley, THE UNIVERSITY OF MELBOURNE, WISCONSIN, UNSW AUSTRALIA, Northeastern University, UNIVERSITY OF MARYLAND

MINORS

Artificial Intelligence and Machine Learning and Machine Learning

Data Science and Analytics

Robotics

Semiconductors

Advanced Communications

Bio-medical Signal Processing

And Many More....

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DEPARTMENT OF ELECTRONICS AND COMMMUNICATION ENGINEERING

M.E COMMUNICATION SYSTEMS

ADMISSIONS OPEN FOR THE ACADEMIC YEAR 2024-25

SVCE started the Department of Electronics and Communication Engineering in the year 1985. The Department offers B.E. in Electronics and Communication Engineering and M.E. in Communication Systems. It is also approved as aResearch Centre in Ph.D and MS (by Research) programmes by Anna University, Chennai.

ABOUT SVCE

Sri Venkateswara College of Engineering (Autonomous) is a premier self-financing institution started in the year 1985. The college offers 10 B.E/B.Tech Programmes and 10 M.E/M.Tech Programmes in Engineering and Technology. The Programs are approved by AICTE and the college is affiliated to Anna University, Chennai. The college is also accredited by National Assessment and Accreditation Council (NAAC). Many programs are accredited by National Board of Accreditation (NBA). The college is also certified by ISO 9001:2015. The institution received the autonomous status in the year 2016. Our Vision is to be a leader in Higher Technical Education and Research by providing state-of-the-art facilities to transform the learners into global contributors and achievers.

ADMISSION INFORMATION

A pass in a recognized Bachelor's degree or equivalent in the relevant field and should have obtained atleast 50% in the qualifying degree examination. Admissions are through Tamil Nadu Common Entrance Test (TANCET) conducted by Anna University or GATE

RESEARCH GRANTS

Our faculty members have received major external research grants from prestigious organizations such as ISRO, AICTE, DRDO, and TNSCST, etc., to the tune of ₹56.26 Lakhs in the last three years for doing various funded projects.

SCHOLARSHIPS FOR PG STUDENTS

- Tution fee (Rs. 50,000/year) waiver for 30% of the students of sanctioned class strength on merit basis, as applicable.
- Management Scholarship for tution fees and assistance for books and instruments.
- GATE Scholarship of Rs. 12,400 per month for students having valid GATE Score. Sponsorships for students to attend conferences.
- Intramural M.E/M.Tech Student Research Grant to carry out innovative projects.

RESEARCH AREAS

Join the Revolution: Transform Communication Systems with SVCE

- Biomedical Instrumentation
- Computer Networks & Network Security
- Digital Signal Processing & Image Processing
- Embedded Systems
- Fiber Optic Communication
- IoT (Internet of Things)
- Nano Electronics
- RF & Microwave Engineering
- Robotics & Artificial Intelligence
- VLSI & Microelectronics
- Wireless Communication Networks

MAJOR RECRUITERS

ERICSSON, CSS CORP, TAFE, amazon, TATA COMMUNICATIONS, ZOHO Work. Online, Infosys, Cognizant, WIPRO, accenture High performance. Delivered., L&T Infotech, HCL