



K.RAMAKRISHNAN COLLEGE OF ENGINEERING

An Autonomous Institution

Permanently Affiliated to Anna University Chennai, Approved by AICTE New Delhi,
ISO 9001:2015, 14001:2015 certified institution, Accredited by NBA and with A grade by NAAC

Samayapuram, Tiruchirappalli – 621 112, Tamilnadu, India.



"Live as if you were to die
tomorrow. Learn as if you were
to live forever."

2021 - 2022

**JAN-JUNE
ISSUE -2**



Krce.ac.in



Dr. K. Ramakrishnan

CHAIRMAN

Dr. K. Ramakrishnan, the esteemed Chairman of our institution, is a visionary leader whose dedication, discipline, and dynamic outlook serve as a constant source of inspiration for the students of the Electronics and Communication Engineering (ECE) Department. A proud alumnus of Annamalai University with a B.E. in Production Engineering, he has devoted his efforts to transforming this rural region into a center of technological and educational excellence. His commitment to hard work, innovation, and leadership motivates ECE students to strive for excellence in their academic and professional pursuits, inspiring them to become creative thinkers, responsible engineers, and future leaders who contribute meaningfully to society.

Dr.S.Kuppusamy



EXECUTIVE DIRECTOR

Dr. S. Kuppusamy, the Executive Director of our institution, is a passionate academician whose dedication and commitment to excellence have shaped his career in education. He holds a B.Sc. in Electronics from Erode Arts College, an MBA from Kongu Engineering College, and a Ph.D. in Management from Bharathiar University, Coimbatore. His blend of technical knowledge and leadership inspires the Electronics and Communication Engineering (ECE) students to pursue innovation, discipline, and success in their academic and professional paths.



K
R
C
E





Dr.D.SRINIVASAN

PRINCIPAL

Dr.D.Srinivasan, The Principal of K.Ramakrishnan College of Engineering, Tiruchirappalli, is a vibrant leader with his ground-breaking approach and proven administrative process produces many young engineering professionals to this society. He received his Ph.D. and Post-Graduation in Manufacturing Technology from the nation's top grade institution NIT, Trichy. Education is not just a process of giving knowledge for a future job but a lifelong process which builds an understanding of moral and ethical values to guide one's life in a right path. KRCE not only focuses on the academic front, but also helps in the development of a student's personality, extra-curricular activities and over all perspective. Everything that makes a good institution - well equipped R&D Cells, Lab facilities for all the departments, Wi-Fi enabled campus, well stacked library with digital facility, career guidance, unique teaching methods, training for competitive examinations, liberty to think and express themselves all are available to mould them to face the challenges confidently

Dr.M.MAHESWARI



HEAD OF THE DEPARTMENT

I am deeply thankful to the Board of management, Director Principal, and the Heads of various departments. Faculty members for their consistent support and active involvement in motivational activities of our department. I extend my heart full thanks to the editorial committee members and students for their tireless effort towards releasing this magazine. Choosing electronics field as profession needs challenging creative and extraordinary mind it gives me pleasure to lead such innovative students, who are the future experts of India



K
R
C
E



DEPARTMENT OF ECE VISION

VISION

To be distinguished as a prominent program for Electronics and Communication Engineering Studies by preparing students for Industrial Competitiveness and Societal Challenges.

MISSION

M1: To equip the students with latest technical, analytical and practical knowledge.

M2: To provide vibrant academic environment and Innovative Research culture.

M3: To provide opportunities for students to get Industrial Skills and internships to meet out the challenges of the society.

The PEOs of the programme are,

PEO1: Graduates will be competent enough to design, develop and integrate complex industrial products for modern electronics and communication systems.

PEO2: Graduates will be able to propose research oriented, industry relevant design solutions in state-of-the-art electronics and communication domains.

PEO3: Graduates will be able to engage in start-up and entrepreneurial activities developing innovative prototypes for the challenging needs of the society.

PROGRAM SPECIFIC OUTCOMES (PSOs)

PSO1: Students will qualify in National level Competitive Examinations for Employment and Higher studies.

PSO2: Students will have expertise in the design and development of Hardware and Software tools to solve complex Electronics and Communication Engineering problems in the domains like analog and digital electronics, embedded and communication systems.



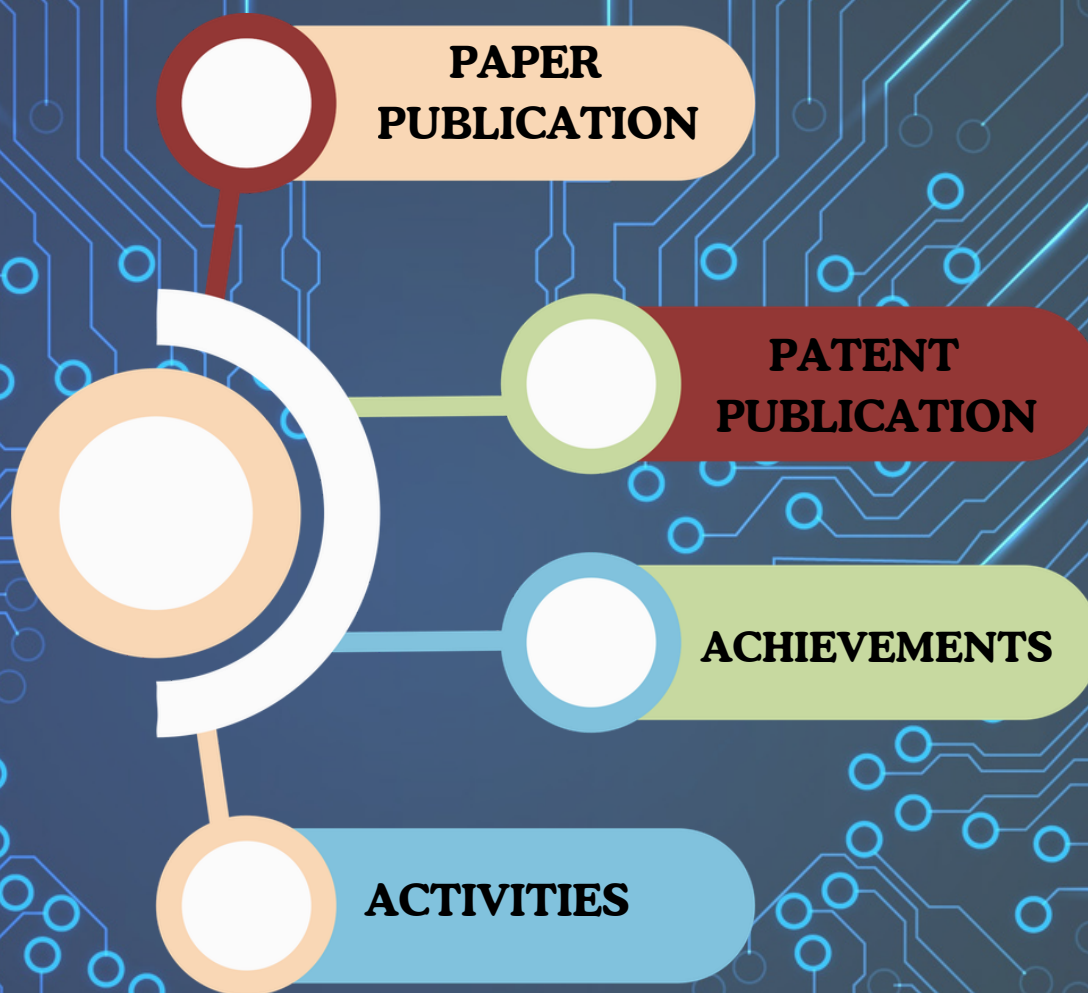
K

R

C

E





K
R
C
E





**PAPER PUBLICATION
STUDENTS 21-22**

TOTAL PUBLICATION: 2



Abinaya S Design of 6-channel optical demultiplexer/coupler using photonic crystal for IFoF in 5G networks <https://doi.org/10.1007/s11082-021-03097-2>



N Nafisa A reversible bistate joint nimply optical logic gate using photonic crystals DOI 10.1088/2040-8986/ac2f73

 PAPER PUBLICATION STAFF
21-22

TOTAL PUBLICATION:39

- ★ Dr.M.Maheswari, An Automatic query expansion based on hybrid CMO-COOT algorithm for optimized information retrieval
- ★ Dr.M.Maheswari, Heuristic analysis of multiplier less desensitized Half-band decimation filter for wireless applications
- ★ S.Janu Priya, Pattern Recognition of Modulation Signal Classification Using Deep Neural Networks
- ★ Mr. N. R. Nagarajan ,Intrusion Detection System for Big Data Analytics in IoT Environment
- ★ Dr.K.Priyadarshini , AI Based Traffic Flow Prediction Model for Connected and Autonomous Electric Vehicles
- ★ Dr.K.Priyadarshini , Intelligent Feature Selection with Deep Learning Based Financial Risk Assessment model
- ★ Dr.K.Priyadarshini , Hybridization of Metaheuristics Based Energy Efficient Scheduling Algorithm for Multi-Core Systems
- ★ Dr.R.Samson Daniel A CPW-fed rectangular nested loop antenna for Penta band wireless applications

 PAPER PUBLICATION STAFF
21-22

TOTAL PUBLICATION:39

- ★ Dr.C.Jeyalakshmi , Dynamic customer churn prediction strategy for business intelligence using text analytics with evolutionary optimization algorithms
- ★ Dr.C.Jeyalakshmi , Automatic wireless health instructor for schools and colleges
- ★ Dr.C.Jeyalakshmi , Intelligent Machine Learning with Metaheuristics Based Sentiment Analysis and classification
- ★ Mr.A.Balakumar ,GPS and LabVIEW Based System for Detection and Control of Maritime Boundary Intruding Boats
- ★ Mr.A.Balakumar , Performance Analysis of peak signal -to-noise ratio and multipath source routing using different denoising method
- ★ Mr.A.Balakumar , A Novel Anomaly Detection Method in Sensor Based Cyber-Physical Systems
- ★ Mr.A.Balakumar , An Intelligent Framework for Traffic Management System using Narrow band IOT
- ★ Ms.S.Anusuya Embedded Systems for Automotive Bio Industry Labelled Compounds to Improve Performance

 PAPER PUBLICATION STAFF
21-22

TOTAL PUBLICATION:39

- ★ Mrs.A.Vidya , E-health monitoring using IOT
- ★ Mrs.J Roselin Suganthi,Fuzzy Logic for Underground Mining Method Selection
- ★ Mrs.J Roselin Suganthi ,Comparative study of BER with NOMA system in different fading channels
- ★ Mr.T.Muruganantham ,Deep Learning Based Autonomous Transport System for Secure Vehicle and Cargo Matching
- ★ Mr. K. Vigneshwaran , A Novel Approach Based on Hybrid Algorithm for Energy Cluster Efficient Head Identification Wireless in Sensor Networks
- ★ Mr. K. Vigneshwaran , Micro and Nanotechnology (MNT) Applications in Healthcare to Build Artificial Organs that Replace Damaged Human Tissue due to Radioactivity
- ★ Mr. K. Vigneshwaran , Microstrip Patch Antenna for PCS and Wireless Networks
- ★ Ms.R.Mahima Prediction of crystalline substance forms in the earlier stage through drug development technique

 PAPER PUBLICATION STAFF
21-22

TOTAL PUBLICATION:39

- ★ Mr.R.Balamurugan , Effects of Novel Material Field Effect Transistor for Heterogeneous Energy and Traffic-Aware Secure Applications
- ★ Mr.R.Balamurugan A Novel method to improve computational and Classification performance of rice plant disease identification
- ★ Ms.P.Malini ,Design, Analysis, and Bio Manufacturing of Disc Brakes with CNC for Reactor Safety
- ★ Ms.P.Malini ,The transmission of Narrowband and Wideband Data Communications via Low-Voltage Power Lines Optimization
- ★ Ms.P.Malini,Internet of Everything (IoE) in Smart City Paradigm Using Advanced Sensors for Handheld Devices and Equipment
- ★ Ms.S.Rajapriya , Machine Learning-Based Pruning Technique for Low Power Approximate Computing
- ★ Mr.M.Karthick ,Blockchain Enabled Optimal Lightweight Cryptography Based Image Encryption Technique for IoT
- ★ Dr.U.Surendar Design of low cost miniaturized meta material circular -based split-ring monopole radiating system for applications

 PAPER PUBLICATION STAFF
21-22

TOTAL PUBLICATION:39

- ★ Dr.U.Surendar A Compact Metamaterial-Based Open-Ended CPW Band-Pass Filter for Wireless Applications
- ★ Mr.P.Muralikrishnan An Enhanced Routing Lifetime Performance Industrial and for Wireless Sensor Networks
- ★ Dr.B.Viswanathan Design of 6-channel optical demultiplexer / coupler using photonic crystal for IFoF in 5G Networks
- ★ Dr.B.Viswanathan Intelligent Biomedical Electrocardiogram Signal Processing for Cardiovascular Disease Diagnosis
- ★ Dr.B.Viswanathan A Reversible Bistate Joint Nimply Optical Logic Gates using Photonic Crystals
- ★ Dr.A.Rajesh Improved calendar disc scheduler for LTE advanced networks with HARQ (2021),
- ★ Mrs.A.Abinaya Parametric Analysis and Simulation of Surface Roughness and tool flank wear in Machining of low carbon alloy steel.



PATENT PUBLISHED 21-22

S.NO	Name Of the Faculty	Topic	Cbr Number/Patent Number/Applicati on Number	Cbr Date/Status
1	Mr. T. Muruganantham, Mr. N. R. Nagarajan, N Kaushik, P Ramkumar, T.Janani, P.Hemapriya, R.Jayasurya, S.Arun Prakash, P. Bhrinta, M. Anees Valentina	Fish Cutting Machine	202141060516 A	07/01/2022
2	Mr. S. Syed Husain Mr. N. R. Nagarajan Mrs. A. Abinaya	An Electronic Lock for Throttle with Cruise Control for Two Wheelers	202141060519 A	07/01/2022
3	Mr. N. R. Nagaraian Mr. T. Muruganantham Mr. R. Balamurugan Mr. P. Muralikrishnan Mr. A. Balakumar Mr. U. Surendar Mr. K. Vigneshwaran, S. Sudhersun, G.Senthil Raja	A Safety System	202141060468 A	07/01/2022

S.NO	Name Of the Faculty	Topic	Cbr Number/Patent Number/Application Number	Cbr Date/Status
4	Dr.C.Jeyalakshmi Mr. T. Muruganantham Mr. M. Karthick	CNN Based Secured and Hygienic Fingerprint Biometric System	202141060475 A	07/01/2022
5	Mr. N. R. Nagarajan, Mr. T. Muruganantham, S. Sudhersun, S R Susmitha, R Venkatesh, D Santhosh, T.Janani, P.Hemapriya, R.Jayasurya, S.Arun Prakash	Children Drown Protection in Open Water Banks	202141060478 A	07/01/2022
6	Mr. N. R. Nagaraian Mr. T. Muruganantham, S.Sudhersun, S R Susmitha, R Venkatesh, D Santhosh, U Kishore, P Nandha kumar S Santhosh Kumar, A Stanly mathew rai	Knife Sharpening Machine	202141060517 A	07/01/2022



PATENT PUBLISHED 21-22

S.NO	Name Of the Faculty	Topic	Cbr Number/Patent Number/Application Number	Cbr Date/Status
7	Mr. T. Muruganantham Mr. N. R. Nagaraian, S. Sudhersun, S R Susmitha, R Venkatesh, D Santhosh, U Kishore, P Nandhakumar, N Kaushik, P Ramkumar	An Accident Prevention System	202141060518 A	07/01/2022
8	Dr.M.Maheswari Mrs.A.K.Thasleem Sulthana Sanofer.S, Roshana.S	Automatic Speed Controller for Two Wheelers	202141060514 A	07/01/2022
9	Dr.B.Viswanathan Dr.D.Srinivasan	Rapid Advanced Collision Detection Warning System Using Automotive Camera Vision for Enhanced Driver Alertness	202241000116 A	14/01/2022



PATENT PUBLISHED 21-22

S.NO	Name Of the Faculty	Topic	Cbr Number/Patent Number/Application Number	Cbr Date/Status
10	Mr.T.Muruganantham Mr. N. R. Nagarajan S. Sudhersun, S R Susmitha R Venkatesh, D. Santhosh, U Kishore	Flood Pseudo Gate	202141060472 A	04/02/2022
11	Dr.K.Priyadarshini Ms.R.Mahima Kaushik N Ramkumar P	Agro Products	202141060487 A	14/01/2022



NPTEL 21-22

- No of Certificate Received - 07
- Percentage of completion - 21.88

No of Students completed : 7

Certificate Category:

Elite + Silver - 1

Elite - 4

Successful Completion - 2



NPTEL 21-22

Academic Year	No. of students registered	No. of students completed	Certification Category
(2021-22)	12	7	Elite +Silver-1 Elite-4 Successful completion-2



ACHIEVEMENT



D.Santhosh of III YEAR ECE
has actively participated in
Guinness record in the topic of
Fabinocci series

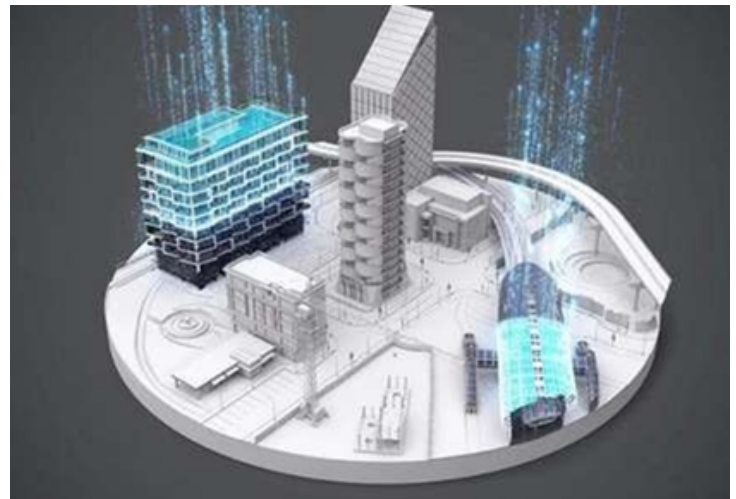


DIGITAL TWIN

AUTHOURS ECC1806-Ms.S.RAMYA & ECC1819-Ms.SHARMILY R INTRODUCTION

A digital twin is a digital representation of a physical object, process, service or environment that behaves and looks like its counterpart in the real-world. A digital twin can be a digital replica of an object in the physical world, such as a jet engine or wind farms, or even larger items such as buildings or even whole cities, alternatively digital twin technology can be used to replicate processes in order to collect data to predict how they will perform.

A digital twin is, in essence, a computer program that uses real world data to create simulations that can predict how a product or process will perform. These programs can integrate the internet of things (Industry 4.0), artificial intelligence and software analytics to enhance the output. With the advancement of machine learning and factors such as big data, these virtual models have become a staple in modern engineering to drive innovation and improve performance. In short, creating one can allow the enhancement of strategic technology trends, prevent costly failures in physical objects and also, by using advanced analytical, monitoring and predictive capabilities, test processes and services



The life of a digital twin begins with experts in applied mathematics or data science researching the physics and operational data of a physical object or system in order to develop a mathematical model that simulates the original.

The developers who create digital twins ensure that the virtual computer model can receive feedback from sensors that gather data from the real world version. This lets the digital version mimic and simulate what is happening with the original version in real time, creating opportunities to gather insights into performance and any potential problems. A digital twin can be as complex or as simple as you require, with differing amounts of data determining how precisely the model simulates the real world physical version.

The twin can be used with a prototype to offer feedback on the product as it is developed or can even act as a prototype in its own right to model what could occur with a physical version when built.

Product twins simulate separate objects. For instance, manufacturers use a virtual prototype of a certain product before setting up a production line to analyze how it will perform under various conditions, and what issues may occur. This allows them to make necessary adjustments and create a more efficient design of goods. Afterward, product twins can be used to control product performance in the physical world. Process twins are responsible for the simulation of processes; for example, manufacturing processes. In a virtual environment, you can create various scenarios of a production process to see what will happen in different situations.

WHEN TO USE IT

Digital twin can be broken down into three broad types, which show the different times when the process can be used: Digital Twin Prototype (DTP) - This is undertaken before a physical product is created Digital Twin Instance (DTI) - This is done once a product is manufactured in order To run tests on different usage scenarios Digital Twin Aggregate (DTA) - This gathers DTI information to determine the capabilities of a product, run prognostics and test operating parameters



CONCLUSION

The growth in Digital Twin use has seen a shift in recent years, facilitated by an increase in the number of published papers and industry leaders investing heavily in developing Digital Twin technology. It would not be possible without the same growth in the AI, IoT and IIoT fields, which are becoming key enablers for Digital Twins.

AI is becoming a component within Digital Twins and exploring where these algorithms can be applied is another avenue of open research. The effects of AI combined with Digital Twin are topics amongst the publications but on a small scale. The exciting and inevitable future research will explore scaling up smaller successful Digital Twin and AI projects.

Dr.K.RAMAKRISHNAN

CHAIRMAN

Dr.S.KUPPUSAMY

EXECUTIVE DIRECTOR

Dr.D.SRINIVASAN

PRINCIPAL

Dr.M.MAHESWARI

HEAD OF THE DEPARTMENT

Mrs.J.ROSELIN SUGANTHI (AP/ECE)

Mr.R.REGAPPAN

EDITOR

Ms.M.JOTHIKA (II YEAR ECE 'A' SECTION)

Ms.ANJUKA (II YEAR ECE 'A' SECTION)

Mr.P.MANOJ (II YEAR ECE 'B' SECTION)

Mr.SASI K (II YEAR ECE 'C' SECTION)

Mr.P.SRIDHAR (II YEAR ECE 'C' SECTION)

Ms.GEETHA PRIYA (III YEAR ECE 'A' SECTION)

Mr.DEEPAK S (III YEAR ECE 'A' SECTION)

Ms.R.RAMYA (III YEAR ECE 'C' SECTION)

Mr.S.RAGUL (III YEAR ECE 'C' SECTION)

Mr.S.V.SIVA HARISH (III YEAR ECE 'C' SECTION)

Ms.REGINI (III YEAR ECE 'B' SECTION)

Ms.ROSHANA (III YEAR ECE 'B' SECTION)

STUDENT COORDINATORS

