TULA'S DEHRADUN | **NAAC A+**

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

डिजिटल DRISHTI

OCT-DEC (2023-2024)

OUTLINE

OVERVIEW OF THE DEPARTMENT

The initiative to provide education and professionalism in computer science and information technology is being led by the Computer Science and Engineering Department. In the institution, the Department of Computer Science and Engineering serves as the central hub. The department posits that education serves as the fundamental basis for comprehensive development and is the sole means by which India can progress towards becoming a developed nation. The department we are a leading force in innovation and advancement in the ever-changing field of technology. We offer over 500 advanced computers with fast data processing and networking capabilities. The department continues to exhibit a robust momentum in scientific innovation. The present issue focuses on the notable achievements of our valued academic members. It is worth mentioning that we p**resent Dr. Priya Matta, Dr. Ahmad Jamal, and Dr. Anand Gupta,** who have achieved notable success through their recent publication of research papers. The success of the Smart **India Hackathon, Brain Buster, and Code Clinic Debugging** Challenge demonstrated our dedication to sharing knowledge and working together. These events provided useful insights and fostered connections within our community. We take great pride in commemorating the achievements of our esteemed students who have successfully obtained placements. In the future, A diverse range of events is anticipated, encompassing a workshop focused on MATLAB programming as well as supplementary courses. The department encompasses a range of instructional resources, such as an intelligent classroom, a departmental library, and an internet infrastructure. The Department of Computer Science and Engineering offers a range of programs, including B.Tech, MCA, and M.Tech. Students are provided with comprehensive instruction in fundamental subjects such as computer algorithms and computer system intelligence. The department also prioritizes the collaboration between industry and academics, organizing a range of workshops, industrial visits, and guest lectures.
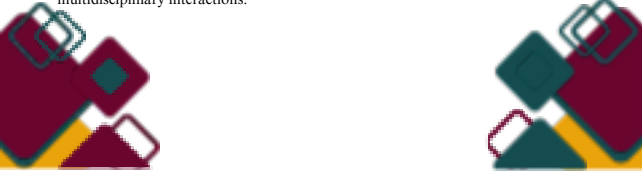

COMPUTER SCIENCE
& ENGINEERING

- DEPARTMENT VISION -

To become the centre of excellence in teaching, research and innovative practices for computing.

- DEPARTMENT MISSION -

- DM 1: To provide a learning ambience to enhance programming skills for problem solving.
- DM 2: To integrate the software industry and academia in order to utilise technology for research, innovation and entrepreneurship.
- DM 3: To develop professionals with a solid foundation who can think outside the box to adapt green computing solution.
- DM 4: To provide a comprehensive computing environment that meets the highest global standards for higher education and lifelong learning.
- DM 5: To create ethical, skilled engineers. through theoretical understanding and practical implementations.

- PEO'S -

- PEO1: To equip students with theoretical and applied knowledge, enabling them to solve multidisciplinary real-life problems, becoming computer engineering professionals in programming skills for technology development, deployment, and system implementation.
- PEO2: Entrepreneurship and Leadership: To cultivate engineering practitioners and leaders, solving industry's technological problems, demonstrating leadership skills, identifying research gaps and becoming successful entrepreneurs.
- PEO3: Lifelong learning: To equip students with creative project management skills that help them become lifelong learners by means of continuing education.
- PEO4 : Social awareness and Ethics: To foster awareness and, accountability and ethics that lead towards efficient collaboration, economic growth and multidisciplinary interactions.

It's an immense pleasure to present this newsletter, "डिजिटल Drishti". I wish that it encourages faculty and staff members, along with students, to use it as a platform to express their tremendous creativity in the coming future. The Computer Science and Engineering Department is a dynamic and vibrant department with a blend of young and experienced faculty. I am thankful to the students, faculty, and staff members of CSE for their valuable input. I especially congratulate my students for participating in various extracurricular activities, research work, and competitive exams. My best wishes to all for their bright careers and successful lives.

Dr. Ahmad Jamal

Greetings to the latest edition of "डिजिटल Drishti", the newsletter of the Computer Science Engineering Department. In the ever-changing realm of computer science, our journey is defined by innovation, resilience, and an unwavering commitment to excellence. As we navigate the corridors of knowledge within our Engineering College, the Department of Computer Science stands at the forefront of transformative education and groundbreaking research. Our dedication to academic excellence remains steadfast. With a team of dedicated faculty and inquisitive minds, we have witnessed remarkable achievements in research, publications, and academic pursuits. The quality of education provided and the intellectual curiosity displayed by our students continue to be sources of pride. A heartfelt thank you to our diligent editorial team for their efforts in consistently producing the departmental newsletter, ensuring that our stories of mentorship reach a wider audience.

Dr. Ashish Gupta

I reflect on our shared journey as we embark on another edition of our esteemed departmental newsletter. With each issue, we've explored new ideas, celebrated achievements, and shared experiences that reflect the dynamic nature of our department. Through the pages of this newsletter, "डिजिटल Drishti", we've witnessed the evolution of our department, from groundbreaking research initiatives to the milestones achieved by our faculty and students. Each article serves as a testament to our collective dedication to excellence and innovation within the CSE Department. Yet, as we look back on our past editions, it's clear that our journey is far from over. With each passing month, we find ourselves confronted with new challenges and opportunities that propel us forward. As the editor of this newsletter, thank you to all who have contributed to the success of this newsletter; your dedication and passion are the driving forces behind our collective achievements.

Ms. Yamin Goyal

LIST OF FACULTY MEMBERS

Dr. Sandip Vijay

Dr. Raghav Garg

Dr. Sunil Semwal

Dr. Tirupuresh Joshi

Dr. Sanjeev Kumar

Dr. Sandeep Kumar

Dr. Anand Gupta
(CSE HOD)

Dr.Ashish Gupta

Dr. Priya Matta

Dr.Ahmad Jamal

Dr. Bharti Kalra

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Mr. Brajendra Sharma

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Mrs. Ritu Pal

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Mrs. Shivali Pundir

Mr. Gaurav Gupta

Mr. Devendra Sood

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Mr. Sharad Singh

Mr.Prashant

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Mr. Aizaz Ahmad
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Ms.Priya Vishkarma
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Mrs. Rashmi Mishra

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Mr. Rakesh Kumar

EDITORIAL TEAM

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Abhishek
(B.Tech CSE 3rd Year)

Shree Bhandari
(B.Tech CSE 2nd Year)

Vaibhav Chauhan
(B.Tech CSE 2nd Year)

Mrs. Shivali Pundir
Faculty (coordinator)

Ms.Yamini Goyal
(Faculty coordinator)

UTKRISHT, Tula's Institute's flagship tech fest, went beyond the ordinary, blending innovative thinking and practical skills in real-life projects. The two-day extravaganza became a catalyst for fun and learning, showcasing inspiring student ideas. UTKRISHT Essence: A celebration of tech, science, knowledge, skills, and colours, mirroring the institute's spirit. Organised with passionate students and faculty, it nurtures knowledge, skill, and performance excellence.

UTKRISHT on November 3–4, 2023's success is credited to the dedicated organising team, led by CS Department students Hafeez Pathan, Vishwesh Chaturvedi, Abhishek Rawat, Deepanshu, Sahil Gupta, Sudhanshu, Akriti Kumari, and Aniket Adarsh. They orchestrated the event over two months, ensuring a seamless blend of technology, creativity, and organisational finesse. Positive feedback hailed UTKRISHT 2023 for flawless execution, enriching experiences, and a perfect blend of activities and highlights. Diverse events encourage learning and enjoyment. Participants, ranging from Code Chronicle's intellect to Rebooking Ahead: As UTKRISHT War's adrenaline-fueled Robo Race 2023 ends, eyes are set on creative PowerPoint animation, an intense hackathon. The organising creativity, motivation, tech innovation, and skill team are fueled by success and development. Enthusiasm ensures the festival's impressive turnout. 2000 participants turned the Continue as a beacon of inspiration event into a vibrant tapestry of ideas. Chairman Mr. Sunil Kumar Jain and V.P. Mr. Raunak Jain added prestige, embracing and encouraging passionate students.

Tula's Institute is abuzz with anticipation as the Computer Science Engineering (CSE) Department gears up for the grand IEEE Tech Symposium 2023, a collaborative endeavor between the esteemed IEEE and Tula's Institute. Scheduled for September 19, 2023, this symposium is poised to be a convergence of knowledge, innovation, and technological prowess. The CSE Department's experienced coordinators Dr. Sanjeev Kumar, Gaurav Mittal, and Dr. Ahmad Jamal, meticulously craft the event to seamlessly blend academic excellence with creative exploration.

Their presence adds a layer of expertise and wisdom to the symposium, ensuring an intellectually stimulating environment for all participants. The presence of coordinators adds a layer of expertise and wisdom to the symposium, ensuring an intellectually stimulating environment for all participants. This symposium, organised in an offline mode, will physically bring together students and faculty at the CSE Department, H-Block, Lab 7, and Tula's Institute. This intentional choice aims to foster a more immersive and collaborative experience, allowing participants to engage with each other in real-time.

The IEEE Tech Symposium 2023 will cover diverse topics in computer science and cutting-edge technologies. The schedule includes keynote addresses, technical sessions, panel discussions, and hands-on workshops. The registration of over 100 students and five faculty members creates anticipation for a memorable and insightful event. The CSE Department's collaborative efforts ensure an intellectually enriching experience for all involved in this much-anticipated symposium.

Smart India
Hackathon
2023

Brain Buster

A recap of the unforgettable event coordinated by the Ritu Pal and Riya Kukreti faculties of the CSE Department. The atmosphere was charged with excitement as the curtains fell on the much-anticipated event, Brain Buster. It witnessed an intellectual showdown like never before. The brains behind the Brain Buster left no stone unturned in ensuring the event's success. Their meticulous planning and dedication were evident in every aspect of the event.

The student coordinators, Hari Singh Joshi and Shreya, played a pivotal role in the seamless execution of Brain Buster. Their enthusiasm and commitment were contagious, creating an engaging and interactive environment for the participants. The primary objectives of Brain Buster were clear to enhance general knowledge and aptitude and to elevate programming knowledge. The event was designed to challenge participants and push the boundaries of their intellectual capabilities. The success of Brain Buster was not only measured by the number of participants but also by the enthusiasm and knowledge gained by each student. The event achieved its objectives of enhancing general knowledge, aptitude, and programming skills, leaving a lasting impact on the participant.

Code Clinic-Debugging Challenge

Code Clinic: Debugging Challenge, organised by the Department of Computer Science and Engineering on November 4, 2023, at Computer Department Lab 5, Tula's Institute, was coordinated by Ms. Rimpi Upadhyaya and Ms. Divya Negi. Student Coordinators were Ankit Anand and Ajay Jha, B.Tech. III year, and CSE Jury members were Dr. Priya Matta and Dr. Shikha Aeron. 40 teams were registered, and one team was external. The objective of the Code Clinic Debugging Challenge is to enhance students's ability to rectify programme errors, identify an algorithm that is unsuccessful when the steps are out of order, and reflect on the debugging process in an age-appropriate way.

Students learned how to identify issues in code, trace the flow of execution, come up with solutions and analyse code, understand its logic, and think critically about potential sources of errors. became familiar with tools like breakpoints, watches, and profilers, enhancing their overall programming skills.

1. Dhami, A., Pareek, P. S., Maurya, S., **Matta, P.**, Rawat, V., & Manu, M. (2023, August). Application and Issues of Blockchain Technology. **In 2023 5th International Conference on Inventive Research in Computing Applications (ICIRCA) (pp. 1283-1288). IEEE.**

The concept of blockchain technology has been spreading like wildfire since it was first proposed in the year 2008. In this research, the core study is carried out on blockchain working while aiming to collect all the necessary and bold information about blockchain technology available on the web. The objective of the study is to develop an understanding of the current research topic, benefits, importance, and future of blockchain from the technical perspective. Several research studies and several databases are analyzed to finally conclude the content of this review study. The proposed research mainly focuses on blockchain technology and its importance.

2. Ahmad, V., Goel, R., Goyal, L., Venaik, A., & **Kumar, R.** (2023, August). **The Contribution of Blockchain-based Supply Chain Finance to Sustainability and Social Responsibility. In 2023 Second International Conference on Augmented Intelligence and Sustainable Systems (ICAISS) (pp. 1190-1195). IEEE.**
Supply chain finance (SCF) is a crucial component of global trade, as it enables companies to obtain financing and optimize working capital while also enhancing supply chain efficiencies. The rise of blockchain technology has introduced new opportunities to enhance the transparency and sustainability of SCF. The study explores the potential benefits of blockchain-based SCF in promoting sustainability and social responsibility. Specifically, this research study highlights how blockchain can increase transparency, traceability, and accountability in supply chains, which can lead to more ethical sourcing practices, reduced waste, and better management of environmental and social risks. Additionally, Small and medium-sized enterprises may have new chances to receive finance and compete on an even playing field with larger businesses with the help of blockchain-based SCF. Ultimately, this study argues that blockchain-based SCF has the potential to contribute to a more sustainable and socially responsible global trade system.

3. Deshpande, B. K., Ara, T., Budhiraja, S., & **Gupta, A.** (2023). **An Intelligent Healthcare System for Quadriplegia Patients using Internet of Things and Machine Learning. International Neurourology Journal, 27(4), 1-11.**
Quadriplegia is a severe medical condition that often leaves individuals with limited or no motor functions in all four limbs, significantly impacting their quality of life and independence. In recent years, advancements in the Internet of Things (IoT) and Machine Learning (ML) technologies have opened new possibilities for improving the healthcare and quality of life for quadriplegia patients. This research presents an innovative Intelligent Healthcare System (IHS) designed to address the unique needs of quadriplegia patients by leveraging IoT and ML technologies. The proposed system consists of a network of interconnected IoT devices and sensors strategically placed in the patient's environment, such as their home or care facility. In this paper, we proposed an IoT-based healthcare system that consists of an accelerometer + gyro sensor and IR sensor with NodeMCU ESP8266 module. Our goal is to develop a system that should be easy to use and affordable. These sensors continuously monitor various aspects of the patient's health, including vital signs, environmental conditions, and movement patterns. The collected data is transmitted in real-time to a central processing unit, where sophisticated ML algorithms are employed to analyze and interpret the information

4. Goyal, A., & **Matta, P.** (2023, September). **Beyond the Basics: A Study of Advanced Techniques for Detecting and Preventing SQL Injection Attacks. In 2023 4th International Conference on Smart Electronics and Communication (ICOSEC) (pp. 628-631). IEEE**
Attacks using SQL (Structured Query Language) injection pose a serious risk to the confidentiality and integrity of databases and web applications. Although tried-and-true methods like input validation and parameterized queries still work well against adversaries, they do so in more creative ways. Researchers and professionals have therefore created cutting-edge techniques to improve detection and mitigation capabilities. Advanced methodologies are examined in this study, including runtime monitoring, behavior-based detection, static and dynamic taint analysis, and anomaly detection based on machine learning. It examines the use of secure coding techniques and web application firewalls as supplementary solutions. The most recent research on SQL injection attacks is reviewed in this research study, along with examples of some of the most recent and effective models, methodologies, and strategies for mitigating, detecting, and avoiding this kind of risky attack. Organizations may strengthen their defenses against SQL attacks, protect sensitive data, and guarantee the stability of their online applications by utilizing these cutting-edge techniques.

5. Batra, R., **Mittal, G.**, & Saha, A. (2023, December).
An Organized Review of Machine Learning (ML) Perspectives in Manufacturing and Quality Control Processes. In 2023 International Conference on Power Energy, Environment & Intelligent Control (PEEIC) (pp. 522-527). IEEE.
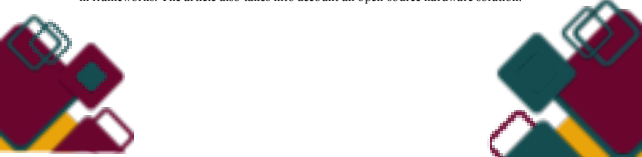
The current era is governed by and Artificial Intelligence (AI) and Machine Learning (ML) techniques in almost every sphere of life. Some of the applications involve healthcare, manufacturing, networking, decision support systems, disease diagnosis systems and many more. Therefore, the given paper presents an extensive today's submission analysis of ML procedures in the atmosphere of industry. The Consumption of ML linked procedures for production method arrangement and regulator, prognostic repairs, regimentation robotics, regulator and optimization, assistance and studying systems aimed at factory Analyses to be conducted on employees, this aims to develop the abilities of employees and specialists in the plant within the field of machine learning (ML). Also, the study analyses of most current advancements in the field during 2017–22 emphasizing practical application and explicitly specifying the mechanism learning algorithms employed within a manufacturing setting for each piece of literature. Lastly, this section provides a synopsis of ML lineup concepts within the context of production processes and identifies investigation slits in this area.

6. Adhikari, P., Prakash, F., & **Sharma, B.** (2023, December).
A Brief Review on Accuracy Level of Smart and Micro Grid Systems Use of ML and DL Algorithms Through Hybrid Integration. In 2023 International Conference on Power Energy, Environment & Intelligent Control (PEEIC) (pp. 528-532). IEEE.

Forecasting of energy is a crucial component in overcoming the challenges of smart grid mechanisms, which include functions such as demand-side management, load reduction, and desirable allocation. The most significant obstacle battling today's grid has to do with efficient forecasting management for restricted predictive inconsistencies. This paper provides a comprehensive and application-focused review of advanced prediction strategies for smart grid systems, as well as the latest advances in the use of Machine Learning (ML) and Deep Learning (DL) approaches. It also discusses the significance of hybridized techniques in improving the accuracy of forecasts. A study of comparison using an hourly energy consumption database has been carried out to evaluate the effectiveness of ML and DL techniques. The analysis' findings highlight hybrid methods' superior efficiency when compared to individual ML, DL, and standard statistical methods.

7. Jaison, F., Taneja, N., & **Waqar, M.** (2023, December).
Revisiting Power System Stability: Definitions And Classifications. In 2023 International Conference on Power Energy, Environment & Intelligent Control (PEEIC) (pp. 1049-1052). IEEE

A actually massive settings is created when horizontal frequency division packet switching, a common technique for high-rate wireless data transport, is integrated with transceivers at the transmitting and receiving ends to increase spectral efficiency and/or to boost system power on time-variant and intensity touchpoints. The multiple access future research directions in design process are investigated in this article, which would include measured data and simulation, input signal spectrum sensing methods employing intuitive arrays, space-time methods, error - correcting computer programming methods, protocol and datagram style, or signal computation for frequency and time standardization, spectrum sensing, and channel locating in frameworks. The article also takes into account an open-source hardware solution.

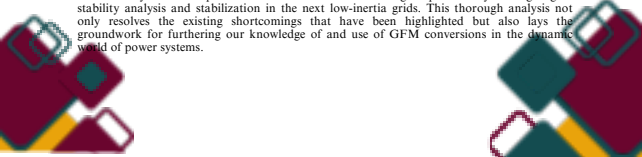**8. Saxena, N.**, Murugan, R., & Khare, M. D. (2023, December).
Enhancing Rural Power Distribution Through Scada and GPRS Automation During the Covid-19 Pandemic in Peru. In 2023 International Conference on Power Energy, Environment & Intelligent Control (PEEIC) (pp. 1062-1066). IEEE.

In the midst of the COVID-19 epidemic, the project focuses on optimizing the network of distribution centers to provide a dependable electrical energy infrastructure serving activities in rural Peru. The main objective is to provide a General Packaged Radio Service (GPRS)-based communication infrastructure. A SCADA (supervising control and data acquisition) graphical interface and a relational database are coupled to this system. This solution makes it possible to monitor status signals in real time, which allows for accurate and timely management of equipment for protection and reconnection. These elements are essential to the distribution network's automated fault correction. When the maximum energy consumption for 2020 was analyzed, billing figures showed a significant decrease because of the broad cessation of commercial, industrial, and service sector operations. This break was brought on by the emergency declaration made in order to handle the COVID-19-related health catastrophe. The ensuing abnormal behavior resulted in power disruptions brought on by overloads and short circuits in the system. Users had several difficulties as a result of these interruptions, which affected their telemedicine, virtual classrooms, remote employment, and other crucial activities. According to the study's findings, the automated equipment successfully logs the causes of malfunctions, the protective measures used, and the stage at which the malfunction happened. Notably, this data is recorded without having to be recorded for on-site maintenance staff. In addition, the automated system guarantees an uninterrupted supply of electricity, meeting the needs of distant operations during the continuing epidemic.

9. Saxena, K., Vijay, S., & Kamalraj, R. (2023, December).
Addressing Power Grid Stability With Grid-Forming Converters in Future Energy Systems. In 2023 International Conference on Power Energy, Environment & Intelligent Control (PEEIC)(pp. 1158-1162). IEEE.

Synchronous generators (SGs) have been a major component of the power system's historical reliance on inertia and grid stability. However, since there is a visible lack of inertia with the growing integration of power-electronics-interfaced clean energy sources, the grid's stability has faced issues during the last ten years. Now, grid-following (GFL) converters are mostly used on the presumption that inertial stimuli are enough to control system stability. However, this assumption turns out to be insufficient for the future low-inertia grids that are projected. Grid-forming (GFM) converters, which emulate the functions of conventional synchronous machinery, have emerged as a possible approach to overcome these issues and enable low-inertia grids. Although the literature provides information on small-signal instability performance study of GFM converters, large-signal instability research is still lacking. Moreover, a multitude of topologies and variations of GFM conversion have been put forward; nevertheless, a thorough comparative analysis that encompasses all GFC variants and specifically addresses large-signal stability concerns is noticeably lacking. By consolidating and contrasting all currently available GFM control techniques from the perspective of large-signal stability concerns, this work aims to close this gap. The goal is to set the stage for further study and development of GFM mode converters designed particularly for large-signal stability analysis and stabilization in the next low-inertia grids. This thorough analysis not only resolves the existing shortcomings that have been highlighted but also lays the groundwork for furthering our knowledge of and use of GFM conversions in the dynamic world of power systems.

10. Gera, P., & **Waqar, M.** (2023, December).
Comparing Fault Location Methods in Transmission Lines. In 2023 International Conference on Power Energy, Environment & Intelligent Control (PEEIC) (pp. 1045-1048). IEEE.

A actually massive settings is created when horizontal frequency division packet switching, a common technique for high-rate wireless data transport, is integrated with transceivers at the transmitting and receiving ends to increase spectral efficiency and/or to boost system power on time-variant and intensity touchpoints. The multiple access future research directions in design process are investigated in this article, which would include measured data and simulation, input signal spectrum sensing methods employing intuitive arrays, space-time methods, error - correcting computer programming methods, protocol and datagram style, or signal computation for frequency and time standardization, spectrum sensing, and channel locating in frameworks. The article also takes into account an open-source hardware solution.

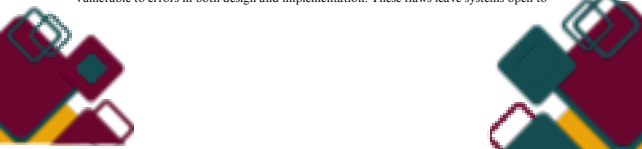11. Bargavi, M., Chandra, S., & **Saxena, N.** (2023, December).
Artificial Electromagnetic Medium Usages in the Energy Sector for the Purposes of Transmission. In 2023 International Conference on Power Energy, Environment & Intelligent Control (PEEIC) (pp. 1053-1057). IEEE

We provide a thorough investigation of the field of metamaterials in order and meta surfaces with particular attention to its uses in wireless energy extraction and wireless power transfer (WPT). In WPT, the electromagnetic field path from source to receiver is divided by radiative technologies, which include both near- and far-field methods, and nonradiative near-field technologies. We evaluate a wide range of designs, comparing and contrasting their many aspects. Our research shows that meta material and meta surfaces are essential for increasing the effectiveness and operating diversity of WPT systems. These novel materials may reduce sensitivity to incoming wave angles and polarizations, increasing the energy conversion effectiveness in wireless energy harvesters. A vital component of both WPT und WEH is the rectenna. Our results demonstrate the advantages of rectennas based on metamaterials, demonstrating their capacity to attain better conversion efficiencies from RF to DC. These prospects highlight the dynamic character of this area, ranging from researching innovative applications to enhancing current solutions. With the advent of wireless energy collecting and transmission, metamaterials play an increasingly important role in influencing the development of efficient and sustainable technologies.

12. Kurmi, R. S., **Gupta, A.**, & Krishnamoorthy, R. (2023, December).
A Technical Bas System Through Cetralised System for Grid Systems in Trnsmission of Data. In 2023 International Conference on Power Energy, Environment & Intelligent Control (PEEIC) (pp. 1067-1071). IEEE.

Industrial communication protocols are used by SCADA (supervising control and data acquisition) networks and Industrial Control Systems (ICS) to enhance their functionality. Modbus is an example of an application protocol that facilitates communication between millions of automation units. Sadly, Modbus lacks essential security features, which makes it vulnerable to errors in both design and implementation. These flaws leave systems open to

eavesdropping, replay, and man-in-the-middle assaults, among other types of attacks. Taking advantage of these vulnerabilities may have serious repercussions for businesses as well as the general public, especially if important infrastructure assets like power stations, water distribution systems, and train transportation networks are attacked. The Modbus association has published security requirements in an effort to fix the security flaws in the protocol. Through the integration of TLS (Transport Layer Security) with the conventional Modbus protocol, these standards seek to improve security. Modbus packets are encapsulated by TLS in order to safeguard message integrity and offer authentication. Digital certificates based on X.509v3 are used by the security features to authenticate the client and server. This paper proposes a new secure version of the role-based access control architecture (RBAC) in order to solve security vulnerabilities with the Modbus protocol. This approach uses a message authorized via unit ID, a unique identifier for approving the Modbus frame, and an authorization procedure via roles, introduced as an arbitrary extensions within the X.509v3 certificate, to approve only the client & the Modbus frame. To summarise, the incorporation of TLS into Modbus, in conjunction with the suggested RBAC framework, effectively tackles security issues and fortifies the protocol's general resilience against any intrusions, guaranteeing the safe and effective functioning of industrial systems.

13. Nidhya, M. S., Sharma, H., & **Gupta, A.** (2023, December). **Optimizing Self-Healing Distribution Networks with Smart RMUS. In 2023 International Conference on Power Energy, Environment & Intelligent Control (PEEIC) (pp. 1072-1076). IEEE.**

Self-healing (SH) smart grids provide vital intelligence characteristics for timely remedial operations in the case of network failures. Intelligent sensors, smart devices, and contemporary communication technologies are all included into the SH design. Owing to the high cost of SH components, especially the computerized ring main block (SRMU), deployment must be optimized to provide best practices at lowest possible cost. In light of numerous economic concerns, this research presents a unique technique for figuring out the ideal number and placements of SRMUs inside power distribution networks. One important consideration for determining the sites of SRMUs is the connection price for on-grid solar energy (PV) installations. To determine the required number of SRMUs, the technique of nonlinear programming NLP (natural language optimization is used, with a focus on cost/benefit analysis-a crucial consideration for Distribution Corporations (DISCOs). In order to maximize network operating efficiency, the best SRMU sites are also chosen using a combination of integer linear programming (it) optimization, which accounts for the expenses of losses, energy not provided (ENS), and PV disconnection. Interest rates and cable failure rates are taken into account in the process. The Egyptian energy distribution network and an experiment for control center construction using SRMU s are also introduced in the paper. Simulation results showing the effectiveness of the suggested strategy are shown together with application of this approach to a modified IEEE 37-node identified as test feeder of a section of a particular district infrastructure in South Cairo, consisting of 158 nodes with dispersed PV power facilities.

14. Kannagi, A., Kumar, S., & **Vishwakarma, P.** (2023, December).
Prevention of Security Against Attacks in Order to Balance the Syatem Using Optimisation. In 2023 International Conference on Power Energy, Environment & Intelligent Control (PEEIC)(pp. 1077-1082). IEEE.

Self-healing (SH) smart grids provide vital intelligence characteristics for timely remedial operations in the case of network failures. Intelligent sensors, smart devices, and contemporary communication technologies are all included into the SH design. Owing to the high cost of SH components, especially the computerized ring main block (SRMU), deployment must be optimized to provide best practices at lowest possible cost. In light of numerous economic concerns, this research presents a unique technique for figuring out the ideal number and placements of SRMUs inside power distribution networks. One important consideration for determining the sites of SRMUs is the connection price for on-grid solar energy (PV) installations. To determine the required number of SRMUs, the technique of nonlinear programming NLP (natural language optimization is used, with a focus on cost/benefit analysis-a crucial consideration for Distribution Corporations (DISCOs). In order to maximize network operating efficiency, the best SRMU sites are also chosen using a combination of integer linear programming (it) optimization, which accounts for the expenses of losses, energy not provided (ENS), and PV disconnection. Interest rates and cable failure rates are taken into account in the process. The Egyptian energy distribution network and an experiment for control center construction using SRMU s are also introduced in the paper. Simulation results showing the effectiveness of the suggested strategy are shown together with application of this approach to a modified IEEE 37-node identified as test feeder of a section of a particular district infrastructure in South Cairo, consisting of 158 nodes with dispersed PV power facilities.

15. Vijay, S., Gobi, N., & Sharma, A. K. (2023, December).
A Novel Approach to Optimize EV's Dealing and Charging. In 2023 International Conference on Power Energy, Environment & Intelligent Control (PEEIC) (pp. 1088-1092). IEEE.

It's an interesting idea to investigate the energy market as a potential means of reducing the power costs related to charging electric cars at public charging stations. Through intraday energy markets., several nations allow electricity trading until just before the delivery time. This research utilizes the market as an illustration to investigate the possibility of lowering power prices via intraday market trading. After conducting extensive simulations., the results show that charging schedule optimization combined with intraday trading in the markets may result in cost savings of around 9% when compared to obtaining all needed energy from the energy provider. A further 2% or more of cost savings may be realized by giving the charging station manager the ability to resell energy to the everyday electricity market. The research explores how the intraday electricity market's lead time and trading unit affect total expenses in addition to any possible cost savings. Lead time is shown to have a major impact on feasible power prices., whereas each trading unit has a negligible impact on the total cost dynamics.

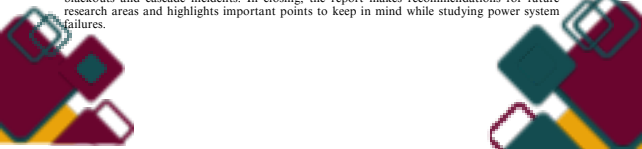16. Sharma, R. K., **Jamal, A.**, & Thiruvenkadam, T. (2023, December).
An Overview of Power System Framework for Ensuring Scalability in Networks. In 2023 International Conference on Power Energy, Environment & Intelligent Control (PEEIC) (pp. 1093-1098). IEEE

There is an increasing amount of integration occurring worldwide in different electric distribution networks between utility-owned / non-utility-owned (customer-owned) digital devices and systems. The development of distribution automation, microgrids, and self-healing systems are examples of utility-owned asset growth. On the other hand, non-utility-owned investments include solar electricity generating, electric cars, and behind-the-meter energy storage technologies. The flexibility and scalability of current centralized control systems are limited, making it difficult to properly integrate the growing variety and quantity of devices, even with the potential information and monitoring points provided by these installations. The limitations of latency, scalability, and connection capacity prevent these new gadgets and networks from actively participating as dynamic resources in the centrally controlled framework. In order to improve operational flexibility by coordinating centralized as well as distributed control systems, this article presents a standards-based architecture for distributed energy system controls. In order to improve resilience in the case of severe events and strengthen dependability during routine operations, the suggested system actively incorporates both utility and non-utility assets and uses a distributed design. The outcomes of field trials, complete information from a continuing full-scale deployment at Duke Energy, and laboratory test results are all included in the conclusions that are given.

17. Batra, R., & **Jamal, A.** (2023, December).
Syncope Prevention in Electrick Power System Networks and Challenges in Implementation. In 2023 International Conference on Power Energy, Environment & Intelligent Control (PEEIC) (pp. 1099-1103). IEEE.

Power structures are fundamental to contemporary society, impacting social welfare, economics, politics, and modernization. The use of several management and protection strategies is essential to guarantee the steady functioning of these complex systems. Power systems still experience problems and failures even when several protective measures are implemented to prevent unanticipated incidents and power outages. If not handled properly, severe situations have the potential to compromise either a large piece of the system or the whole one, thereby resulting in blackouts and cascade failures. Realizing how serious these consequences may be, several nations have set up research groups whose only purpose is to avoid blackouts in their electrical networks. This essay offers a thorough analysis of the significant blackouts and chain reactions that have occurred in the last ten years. Using easily accessible historical data, the research focuses especially on power system disruptions in the country that is the largest worldwide power provider. The analysis also explores the underlying factors that contribute to blackouts globally. The study also examines blackout and cascade analytic techniques, illuminating the effects of such occurrences. There are problems with the preventive mechanisms that are already in place, and there are research gaps on power system blackouts and cascade incidents. In closing, the report makes recommendations for future research areas and highlights important points to keep in mind while studying power system failures.

18. Karthikeyan, M. P., & **Garg, R.** (2023, December).
Optimizing Power Flow with Hvdc Lines and Facts for Improved Power System Stability. In 2023 International Conference on Power Energy, Environment & Intelligent Control (PEEIC) (pp. 1104-1108). IEEE.

The increasing expenses incurred in the establishment of transmission networks, in conjunction with the essential function these networks serve in reorganized settings, highlight the need of using Flexible AC Transit System devices. The ideal placement and capacity distribution for Thyristor-Controlled State Capacitor in networks of transmission are important factors that are covered in this research. The suggested approach develops an objective function with the dual goals of reducing losses and increasing server capacity. Both technological and economic viewpoints are used in the inquiry, and the results are described appropriately. The results of the simulation demonstrated the effectiveness of the suggested approach in terms of both technical and financial factors. The infrastructure's load index significantly improved as a result of this compensation, rising by 23.02%. In addition, the economic method reduced power losses and improved network load ability by using the simulation to identify the best placement and capacity that produced the most profit. The thorough outcomes highlight how well the suggested methods worked in a variety of case studies.

19. Krishnamoorthy, R., Kaur, S., & **Kalra, B.** (2023, December).
System Health Monitoring System Implementation: A Fact System. In 2023 International Conference on Power Energy, Environment & Intelligent Control (PEEIC) (pp. 1109-1113). IEEE.

In this study, a novel online health monitoring method for modular multilevel conversions DC capacitors is introduced. The primary objective of the fundamental health monitoring algorithm is to detect changes in the DC resistivity value over time. Interestingly, the suggested technique only uses measurements that are often seen in high-voltage straight-current applications and flexible electrical transmission systems. As a result, our estimating approach does not use any additional sensors. Noise in current or voltage measurements is taken into consideration in the estimating technique. To successfully decrease estimate errors, it uses a specific low-pass filter in combination with a recursive least squares estimator. Based on actual data from an inexpensively MMC prototype and simulation results from a hardware replica, it is clear that the suggested approach can accurately determine the DC-link capacitance amount with an approximate error of 1%.
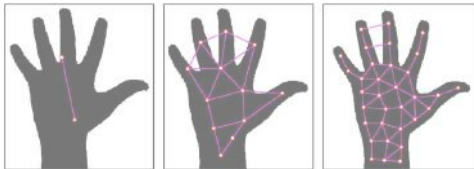
Title: Hand Sign Recognition

Under the guidance of **Girish Bisht Singh,** Assistant Professor, our students Harshit Kumar, Abhishek Raj Singh, Ankit Kumar, and Nitesh Kumar published a research paper titled "Hand Sign Recognition.".

In the realm of recent technological advancements, there has been remarkable progress in computer applications focusing on human–computer interaction (HCI), exemplified by augmented reality (AR) and the Internet of Things (IoT). Consequently, hand gesture recognition has emerged as a contemporary and dynamic research domain within computer vision. Body language serves as a crucial means of communication among individuals, complementing voice messages or standing alone as a comprehensive form of communication. Consequently, the integration of automatic hand gesture recognition systems holds the potential to enhance human–computer interaction. Numerous methodologies for designing hand gesture recognition systems have been proposed; however, the majority of these methods involve hybrid processes encompassing image pre-processing, segmentation, and classification. This paper introduces an approach to effortlessly and swiftly construct a hand gesture model through the utilization of a finely-tuned deep convolutional neural network (CNN). Experimental evaluations were conducted using the Cambridge Hand Gesture dataset to showcase the success and efficiency of the CNN. The achieved accuracy stood at 96.66%.

"Guardians of the Virtual Realm"

Navigating the Unseen Landscape of Cybersecurity

Hafeez Pathan
(B. Tech CSE 3rd Year)

In a world where our lives are increasingly intertwined with the digital realm, the guardians of our virtual safety, known as cybersecurity experts, work tirelessly to protect us from unseen threats. This article invites you to explore the fascinating and critical world of cybersecurity.

1. The Digital Battlefield: Understanding Cyber Threats

Delve into the evolving landscape of cyber threats, from traditional viruses to sophisticated ransomware and phishing attacks. Paint a vivid picture of the digital battlefield that cybersecurity professionals navigate.

2. Cybersecurity Heroes: The Silent Guardians

Introduce the unsung heroes of the digital age – cybersecurity professionals. Share stories of real-life cybersecurity experts who have thwarted cyber- attacks and discuss the skills and mindset required for this crucial role.

3. The Price of Ignorance: Cybersecurity for Individuals

Examine the common misconceptions and practices that leave individuals vulnerable to cyber threats. Provide practical tips for readers to enhance their cybersecurity, making the topic relatable and actionable.

4. Beyond the Firewall: Corporate Cybersecurity Challenges

Explore the unique challenges faced by businesses in securing their digital assets. Discuss recent high-profile cyber-attacks on corporations, emphasizing the far-reaching consequences of breaches and the importance of robust cybersecurity measures.

5. Innovations in Cybersecurity: Staying Ahead of the Game

Highlight cutting-edge technologies and strategies employed in the world of cybersecurity, such as artificial intelligence for threat detection and blockchain for secure transactions. Showcase how the field is constantly evolving to stay one step ahead of cybercriminals.

6. Ethical Hacking: A Force for Good

Introduce the concept of ethical hacking and how cybersecurity professionals use it to identify and fix vulnerabilities before malicious hackers can exploit them. Highlight the ethical dilemmas faced in the pursuit of digital security. Summarize the importance of cybersecurity in our interconnected world and express gratitude for the dedicated professionals working behind the scenes. Encourage readers to take an active role in their digital safety and stay informed about cybersecurity developments.

Provide links to reputable cybersecurity resources, and encourage readers to follow cybersecurity best practices, and share the article with friends and family to promote digital literacy.

CYBERSECURITY

Shivani
(B.tech CSE 3rd Year)

She

She stood strong before the
fiery stroms.
Keeping all the fears
beneath her..
She slayed in every
phase,smiled and
Took all the pain with ease.
She was strong enough to
face the world.
Sacrificing her needs to
make you strong.
Loving you more day by
day and protecting from
every evil soul
She is a superwomen with
all the power.
She is enough to protect
you
| from the world.
She is no one but "YOUR
MOM"

Jayant Rawat
(B.tech CSE 3rd Year)

Learning

In the halls of learning,
where knowledge gleams,
Dreams take flight, fueled
by academic streams. A
tapestry of thought, ideas
sought,
In pages turned, inspiration
caught.
Science and art, a
symphony of the heart,
In education's embrace,
brilliance a part.
Each stanza, each line,
echoes the theme,
A journey of learning, like a
flowing stream.

Ms. Yamini Goyal

Five Elements of Nature

A lot of ancient philosophies around the globe classify the composition of the universe into 5 elements: Earth, Water, Fire, Air, and Ether (Space). These are also called the "Pancha Maha Bhutas." Knowledge of these five elements helps us understand the laws of nature. The concept of the "Five Elements" is a fundamental aspect of several traditional philosophical and medical systems, notably in Eastern traditions such as Ayurveda in India, Chinese philosophy, and others. These elements are not to be confused with the chemical elements mentioned in the previous response. Instead, they represent five essential qualities or energies believed to compose the natural world and influence various aspects of life. Five Elements holds significance in various spiritual and philosophical traditions around the world. The Five Elements are often used to understand the dynamic interplay of energies in nature and within the human body.

Earth (Prithvi): The physical body is often associated with the element of earth. This includes solid structures such as bones, muscles, tissues, and organs. Earth represents stability and the tangible aspects of the body. Earth is associated with the physical body, stability, and the material world. It represents the foundation and support for life.

Water (Jala): Water is associated with bodily fluids, representing the fluidity and adaptability within the body. This includes blood, lymph, saliva, and other fluids that are vital in transportation, lubrication, and overall balance. Water symbolizes emotions, intuition, and the flow of life. It is often associated with change, purification, and the ability to adapt to different situations.

Fire (Agni): Fire is often linked to metabolic and transformative processes within the body. It symbolizes the energy and heat generated through processes like digestion and metabolism. The digestive fire (Agni) is particularly emphasized in some traditions. Fire is linked to energy, passion, and transformation. It symbolizes both literal and metaphorical heat, driving change and fostering growth.

Air/Wind (Vayu): Air is associated with the breath and the respiratory system. The exchange of oxygen and carbon dioxide in the lungs reflects the movement and vital life force associated with the element of air. It is also linked to the nervous system and the energy of movement in the body. Air represents the qualities of movement, change, and intellect. It is associated with communication, travel, and the exchange of ideas.

Ether/Space (Akasha): Ether or space is often associated with the spaces within the body, such as the empty spaces in organs, joints, and the overall body cavities. It represents the subtlest aspect and is connected with the concept of consciousness. Some traditions consider the spaces within the body as channels for the flow of energy (prana). Ether or space is a subtle element representing the expansive nature of the universe. It is associated with the idea of vastness, connection, and the infinite potential that exists. It's important to emphasize that these associations are symbolic and metaphorical, providing a framework for understanding the interconnectedness of the human body with the elements of nature. In many spiritual traditions, the balance and harmony of these elements within the body are considered crucial for overall health and well-being. Practices such as yoga, Ayurveda, and traditional Chinese medicine incorporate these elemental concepts to guide individuals toward physical, mental, and spiritual balance.

SPORTS ACHIEVEMENT

Tula's Premier League was a two week tournament which began on the 19th October 2023 in cricket ground. Eight teams were participated and gave their best performance. The Final match was between Flying Eagles and Challengers XI. The match was won by Flying Eagles by 180 Runs. The prize ceremony was done by Mr Raunak Jain ,Vice - President (Tula's Group) and Dr. Raghav Garg ,Vice - President (Technology).

Following Titles were awarded :
Man of the Match :- Nitish kumar
Man of the series :- Tarun Mishra
Best Batsman :- Tarun Mishra
Best Baller :- Aditya Kishan
Best Fielder :- Shubham kumar

TULA'S BADMINTON LEAGUE

Tula's badminton league was organised from October 26-27, 2023.
After the inauguration day, the tournament continued for the next three days where knockout matches were played between the college students. On the final day, finals of all the categories were played and the list is as follows.

- Himanshu Kumar won the tournament of Boys Single
- Pallav Mehta and Jainish Kumar won the tournament of Boys Double
- Pallav Mehta and Aarushi Aggarwal won the tournament of Mix Double
- Sakshi Sandaliya won the tournament of Girls Single

The price distribution was done by Mr.Raunak Jain(Vice President Tula's group) and Dr. Raghav Garg (Vice President Technology) at Tendulkar's Pavilion on 30th October 2023.

Student's Artwork

Sakshi Pandey
(B.Tech CSE 3rd Year Sec - B)

MadhuLikha Choudhary
(B.Tech CSE 2nd Year Sec - B)

Pathan Hafeez
(B.Tech CSE 3rd Year Sec - B)

MadhuLikha Choudhary
(B.Tech CSE 2nd Year Sec - B)

Placement Opportunities

Placement Opportunities

DARSHANA PALKHEDE
B.TECH ECE
3 LPA | PLACED @
Dixon
The brand behind brands

TULA'S | NAAC A+
GLIMPSES OF THE
CAMPUS PLACEMENT DRIVE
WITH
ARTECH
INTELLIGENCE IS HUMAN

KUNAL AGARWAL | PRANAV RAJ
B.TECH CSE
4 LPA | PLACED @
SEASIA
a CMMI Level 5 Company

TULA'S | NAAC A+
#8TH CAMPUS
PLACEMENT DRIVE
ARTECH
INTELLIGENCE IS HUMAN
DATE
14TH SEPT, 2023
ELIGIBILITY
B.TECH (CSE, ECE, EEE)
BCA, BBA & MCA
2024 BATCH
CTC: ₹4.68 LPA

Announcements

FULL STACK DEVELOPMENT FROM
JANUARY 23 - FEBRAURY 10, 2024

MOBILE APP DEVELOPMENT FROM
FEBRUARY 5-7, 2024

2 DAYS HAND ON FACULTY DEVELOPMENT PROGRAM FROM FEBRUARY 12-13, 2024

INDUSTRIAL VISIT AT REGIONAL SCIENCE CENTER UCOST VIGYAN DHAM (TO BE DECIDED)

TULAS

WELCOME

2024