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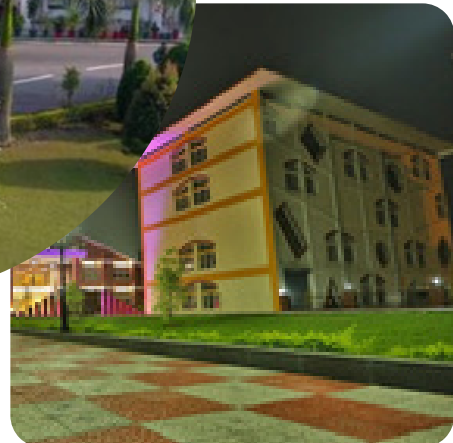
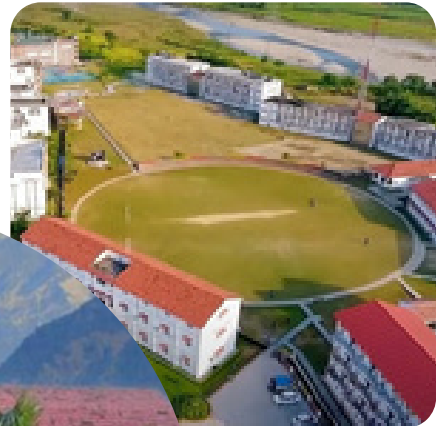


**TULA'S**  
DEHRADUN INSTITUTE

**NAACA+**

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

# डिजिटल DRIHTI





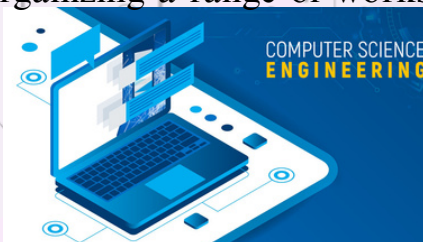
# **OUTLINE**

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## Overview of the Department

The Computer Science and Engineering Department is spearheading the effort to provide professionalism and education in computer science and information technology. The Department of Computer Science and Engineering is the main center of the organization. The department makes the claim that education is the only way for India to move toward being a developed country and that it is the cornerstone of all holistic development. Our department is a driving force behind innovation and progress in the rapidly evolving world of technology. More than 500 cutting-edge PCs with quick data processing and networking features are available from us. The department's scientific innovation is still moving at a strong pace. This edition highlights the noteworthy accomplishments of our esteemed faculty members. It is important to note. We are pleased to introduce to you **Dr. Sandip Vijay, Dr. Raghav Garg, Dr. Sunil Semwal , Dr. Tripuresh Joshi Dr. Bharti Kalra, Dr. Ahmad Jamal, Dr. Anand Gupta, Mr. Girish Bisht, Ms. Akansha Shrivastav, and Mr. Rakesh Kumar**, all of whom have recently published research articles and have achieved remarkable success. Our commitment to knowledge sharing and teamwork was evident in the success of the **add-on courses**, which included **full stack development, mobile app development**, and the **Industrial Visit to Drone Application and Research Center (ITDA)**. These gatherings strengthened ties throughout our community and offered insightful information. 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.



# Departmental Vision & Mission

## - 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.

## From The Faculty's Desk



**Dr. Priya Matta**

It's time to take a moment to acknowledge and celebrate our department's accomplishments as we come to the conclusion of yet another fruitful quarter. Our faculty members have been very committed and knowledgeable throughout the previous three months, spearheading several initiatives and projects that have had a long-lasting effect. The additional certificate for second- and third-year students, which demonstrates our department's dedication to quality and innovation, was one of the many noteworthy accomplishments of this quarter. These accomplishments are a tribute to our faculty members diligence and spirit of teamwork, which further enhances our department's standing in their respective professions. Every member of our staff contributes significantly to the advancement of our purpose and objectives, whether it is by ground-breaking research, significant community involvement, or transformational teaching. Let's maintain the energy created by these accomplishments as we anticipate the next quarter, expanding on our past triumphs and seizing fresh chances for development and progress. Together, we'll keep expanding our knowledge, motivating the next generation, and improving our community and the world at large.



**Dr. Bharti Kalra**

In the ever-evolving realm of academia, every academic quarter brings out a distinct array of difficulties and possibilities. Upon contemplation of the last three months, it is clear that our department has successfully managed these intricacies with fortitude, ingenuity, and an unwavering dedication to achieving the highest standards. By working together and using innovative approaches, we have not only tackled current obstacles but also established the foundation for future expansion and achievement. The department's diverse commitment to developing knowledge and effecting good change is shown by its research programs and creative teaching approaches. Nevertheless, it is important to recognize that advancement is not devoid of obstacles. During the quarter, we have faced challenges and failures that have challenged our determination and creativity. However, it is by surmounting these obstacles that we have uncovered fresh prospects for acquiring knowledge, development, and originality. As we begin the next stage of our journey, let us continue to use the knowledge obtained and the progress made throughout this quarter. Let us persist in embracing change, cultivating cooperation, and pushing the limits of what is achievable in our own domains.



**Ms. Shivali Pundir**

I'm excited to consider the department's overall accomplishments as well as the combined accomplishments of our editorial team as we wrap up another fruitful quarter. We have worked ceaselessly for the past three months to generate content that educates, captivates, and motivates our audience. Despite the obstacles encountered, we have successfully surmounted them by means of collaboration, perseverance, and a collective dedication to achieving the highest standards. I would like to express my sincere gratitude to every individual within our team for their diligent efforts and valuable contributions within the department. Collectively, we have shown the potential that can be attained when we unite with a shared objective. As we anticipate the next quarter, I am enthusiastic about seeing our ongoing growth and collaborative innovation. I express my gratitude to the whole department for their ongoing support, effort, and enthusiasm.



# 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  
(H.O.D.)**



**DR. ASHISH GUPTA**



**DR. PRIYA MATTA**



**DR. AHMED JAMAL**



**DR. BHARTI KALRA**



**DR. SHIKHA AERON**

# List Of Faculty Members



**DR. MUSHEER VAQUER**



**MR. BRAJENDRA SHARMA**



**DR. NIRMENDRA**



**MS. SUCHI JAIN**



**MRS. PRIYA BHARDWAJ**



**MRS. RITU PAL**



**MS. VAIBHAVI PAINULY**



**MS. NEHA CHAUHAN**



**MRS. SHIVALI PUNDIR**



**MR. GAURAV GUPTA**



**MR. DEVENDRA SOOD**



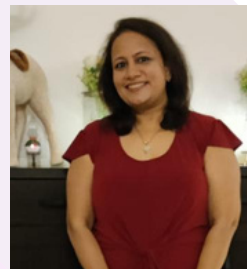
**MS. SANTWANA GOEL**



**MR. SHARAD SINGH**



**MR. PRASHANT**



**MS. ARTI GOEL**



**NEWLY  
JOINED**

**MR. PRAKHAR GOEL**



# List Of Faculty Members



**MS. AKANKSHA SRIVASTAV**



**MR. SIDDHARTH SHARMA**



**MR. AIZAZ AHMAD**



**MS. RIMPAY UPADHYAY**



**MR. GIRISH BISHT**



**MS. DIVYA NEGI**



**MS. NISHA GUPTA**



**MS. PRIYA VISHVKARMA**



**MR. GAURAV MITTAL**



**MRS. RASHMI MISHRA**



**MR. JAVED**



**MR. ANUJ RAJPUT**



**MR. YASHPAL**



**MR. RAKESH KUMAR**



**MR. MURSLEEN**



**MS. HEMA RAWAT**



# EDITORIAL TEAM



**HAFEEZ PATHAN**  
(B.TECH CSE 3RD YEAR)



**MAHESH PANDIT**  
(B.TECH CSE 2ND YEAR)



**SONU NIGAM**  
(B.TECH CSE 2ND YEAR)



**AKANSHA CHAUHAN**  
(B.TECH CSE 2ND YEAR)



**AAKRITI**  
(B.TECH CSE 2ND YEAR)



**MRS. SHIVALI PUNDIR**  
FACULTY (COORDINATOR)



**MR. TAUSEEF IQBAL**  
COORDINATOR (DESIGNING)

# DEPARTMENTAL EVENTS

## Full Stack DEVELOPMENT

The 6-week Add-On Full Stack Web Development Program, organized by the Department of Computer Science and Engineering, effectively addressed the disparity between theoretical comprehension and real-world implementation. The program offered practical training in the development of dynamic and scalable web applications utilizing industry-relevant frameworks and languages. It was supervised by faculty coordinators **Mr. Sharad Pratap Singh** and **Ms. Divya Negi**, and included **Mr. Kuldeep as a speaker**. The program had a total of **130 student participants**. Students explored many programming languages, including HTML, CSS, JavaScript, and frameworks such as React and Angular, as well as server-side technologies like Node.js, Python, and Ruby. Additionally, they examined database management systems like MongoDB and MySQL. By engaging in practical projects and attending lectures delivered by industry professionals, students acquired significant knowledge on current industry trends and optimal methodologies, so enhancing their preparedness for the ever-evolving domain of web development.



### ADD-ON CERTIFICATE COURSE

#### Full Stack Development

Seminar Hall (C - Block) | 23-01-2024 to 30-03-2024 | 09:40 AM to 04:30 PM

Event Coordinators:  
**Mr. Sharad Pratap Singh, Ms. Divya Negi**



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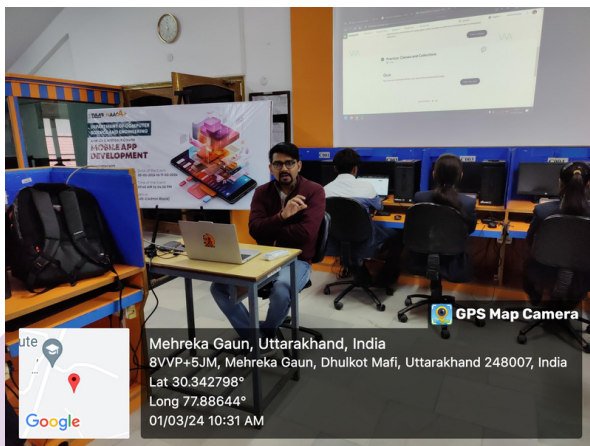


# DEPARTMENTAL EVENTS

## MOBILE APP DEVELOPMENT



An add-on certificate program in mobile app development is being organized by the Department of Computer Science and Engineering. The Department of Computer Science & Engineering plans to run it from February 5th to February 17th, 2024. Through this program, learners will be able to acquire the fundamental information and abilities needed in the current digital era. The program offers a thorough road map for navigating the world of mobile app development, covering a wide range of topics like market research, design principles, development methodologies, testing strategies, deployment procedures, post-launch optimization, monetization strategies, and security considerations. With a focus on its concise syntax, interoperability with Java, null safety features, coroutines for asynchronous programming, functional programming constructs, and integration with Android Jetpack, the program highlights the importance of Kotlin, a modern programming language for mobile development. By using Kotlin's features, developers may increase efficiency, scalability, and dependability while creating creative mobile apps, giving them a competitive advantage in the quickly changing digital market.



**DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING**

Add-On Certificate Course

## MOBILE APP DEVELOPMENT

Association with



**ICTACADEMY**

Date of the Event:  
05-02-2024 to 17-02-2024

Time of the Event:  
09:40 AM to 04:30 PM

Venue:  
Lab-2(Admin Block)





## DEPARTMENTAL EVENTS

**Innovate  
or Evaporate<sup>®</sup>  
24 HOUR HACKATHON**



The goal of the 24-hour institute-level hackathon that took place on **March 18 and 19 '2024**, was to encourage student creativity and problem-solving. **Divya Negi, Mr. Anuj Singh Rajput, and Ms. Hema Rawat**, three faculty members, organized the event with the help of student organizers. A **total of 131 enrolled students** participated in it. In order to demonstrate their creativity and problem-solving skills, participants were able to choose issue statements from the Smart India Hackathon or to submit their own creations. A supportive atmosphere for unbroken ideation and growth was created by providing rest areas and scheduled food breaks. Thirty software projects were produced during the hackathon, showcasing the creativity of the students working under the strict 24-hour period. The competition consisted of two crucial rounds: the first in which teams showcased their concepts, philosophies, and methods, and the second in which they assessed the generated working models or prototypes. An award ceremony honoring the participants accomplishments and efforts marked the event's conclusion. This hackathon promoted an innovative and useful culture while giving students a venue to put their ideation, collaboration, and rapid prototyping talents to use. The program contributed to the overall growth of participants and fostered an innovative culture inside the institution by tackling real-world challenges in a limited amount of time. It was an excellent example of teamwork and problem-solving.



# DEPARTMENTAL EVENTS

## INDUSTRIAL VISIT TO DRONE APPLICATION AND RESEARCH CENTER (ITDA)



The purpose of the student's industrial tour to the Drone Application and Research Center, ITDA, was to get direct experience in the operational dynamics and technical breakthroughs of the drone industry. Under the guidance of **faculty supervisor Dr. Shikha Tayal Aeron** and **student coordinators Arya Bandhu and Rishav Gupta**, participants conducted a comprehensive examination of drone technology. This exploration included interactive seminars and practical demonstrations. The tour began by providing a comprehensive examination of the capabilities of drones, emphasizing their many uses in sectors such as agriculture, infrastructure inspection, and disaster management. In addition, we took into account regulatory factors, with particular emphasis on safety standards and legal obligations, in order to guarantee the proper use of drones. During the tour, participants engaged in practical workshops that offered excellent hands-on experience in operating drones, organizing flights, and analyzing data, all under the leadership of industry professionals. These activities not only improved participants technical abilities but also fostered their confidence in efficiently using drone technology. The tour presented real-world case studies that motivated students to investigate drones as cutting-edge instruments for resolving problems.





# DEPARTMENTAL EVENTS

## INDUSTRIAL VISIT TO INNOVATION AND VIRTUAL LAB AT REGIONAL SCIENCE CENTER

Tula's Institute's Department of Computer scientific and Engineering sought to provide students an interactive scientific and technology learning environment. **The visit on February 3, 2024, included 34 B.Tech CSE students**, who were led by faculty coordinators **Ms. Vaibhavi Painuly and Dr. Shikha Tayal Aeron**, as well as student coordinator **Arya Bandu**. The tour began with distinguished visitors including **Dr. D P Uniyal**, Joint Director of UCOST, and **Er. S.S. Shrimali** from ICAR, on the eve of the Regional Science Center's eighth foundation day.



The Virtual Reality (VR) kiosk was launched by Prof. Durgesh Pant, Director-General of UCOST, who also emphasized the center's scientific engagement activities and the importance of VR in interactive learning. Students gained multidisciplinary insights and practical applications of technology via lectures on biological investigations in the Himalayas and technical solutions in environmental management. Students were given the opportunity to explore virtual reality technology via an immersive experience as Prof. Durgesh Pant and Er. S.S. Shrimali inaugurated the virtual reality kiosk. Students also got to learn more about different scientific topics by exploring the Innovation Hub, Fun Science Gallery, Himalaya Gallery, and Frontiers of Technology Gallery. Students were encouraged to think logically during the visit since they were exposed to practical applications of technology and participated in interactive learning activities at the Innovation Hub.



# Innovation & Research Collaboration

I. Bansla, V., Kumar, S., Sharma, V., Bisht, G. S., & Srivastav, A. (2024).

**A Study Centering on the Data and Processing for Remote Sensing Utilizing from Annoyed Aerial Vehicles. *Advances in Aerial Sensing and Imaging*, 313-331.**

The impacts of climate change have developed into a global worry that threatens the productive capacity of various land surface systems, including agriculture, forestry, and others. This problem has evolved into a worldwide concern as a result of the fact that the consequences of climate change have become a worldwide concern. As a direct consequence of this threat, the globe is now in jeopardy. The growth of agroforestry systems in today's fast-paced world depends on the economic value derived from using Remote Sensing (R.S.) technology to monitor agricultural and forest resources. Both natural and agricultural resources can be better monitored using R.S. Traditional radio-surveillance equipment may also be deployed via platforms such as satellites and crewed aeroplanes, which are considered feasible choices. These systems' spatial, spectral, and temporal resolutions are the subject of ongoing research and development activities. These efforts are being directed towards enhancing spatial resolution. AAVs are a potential alternative to conventional radio frequency platforms because of the high geographical and temporal resolutions they provide, their flexibility, and the lowered costs associated with their operation. Utilizing R.S. platforms has taken up much time during this project. AAVs are one of the most suitable options for managing forest resources. As a result of these factors, the use of AAVs has emerged as one of the most promising strategies for the administration of forest resources. Using Annoyed Aerial Vehicles (AAVs) is one of the most suited alternatives since it offers all these advantages. This article's objective is to throw some light on the most effective uses of Annoyed Aerial Vehicles (AAVs) in the area of forestry today. It will accomplish this by providing an overview of the sensors that should be used in each scenario and the processes utilized for data processing. The article will also concentrate on the most critical applications of Annoyed Aerial Vehicles (AAVs) in agricultural settings.



## Remote Sensing

# Innovation & Research Collaboration

2. Gupta, A. K., Raghavendra, R., & Sikri, A. (2023, December).

**IoT And IIoT Integrated Spruce Grid System. In 2023 International Conference on Power Energy, Environment & Intelligent Control (PEEIC) (pp. 1114-1118). IEEE.**

The Network of Things is a rapidly developing field of technology that provides creative solutions in many different areas, most notably essential infrastructures. Its revolutionary effect is especially seen in the field of standard electricity systems, where it makes the transition to a more intelligent and efficient energy grid easier. This analysis explores the architecture and features of Internet of Things (IoT)-enabled intelligent energy grid systems, with an emphasis on several IoT technologies (sensing, communication, and computation) and their respective standards within the smart energy grid context. This page also offers a thorough summary of previous studies on the use of IoT in systems with smart grids. A review of current studies and literature indicates a significant worry about the security flaws that IoT technologies and energy systems are known to have. As a result, we examine popular threat as attack models that are unique to IoT-enabled power plants and compile mitigation strategies designed to deal with these security issues. The article's conclusion highlights the use of cutting-edge technology, such as blockchain, artificial intelligence, and machine learning, to improve the security and resilience of IoT-enabled energy networks. These cutting-edge solutions help to improve the efficacy, stability, and dependability of smart energy systems by tackling contemporary issues including security flaws. This comprehensive investigation offers insightful information on the architecture of IoT-enabled clever energy systems, the security issues they raise, and how cutting-edge technology might improve their overall efficacy systems.

# IoT

Internet of Things



# Innovation & Research Collaboration

3. Kalra, B., Prakash, F., & Sharma, H. (2023, December).

**Implementing Smart Grids via Cognitive Radio: An Overview. In 2023 International Conference on Power Energy, Environment & Intelligent Control (PEEIC) (pp. 1119-1124). IEEE.**

Quality of service issues related to antiquated communication frameworks in conventional electrical grids are addressed by the cognition smart grid connectivity paradigm. By incorporating cutting-edge communication and information technology into electric power lines, this novel strategy promotes a two-way exchange of information. However, there is a significant need for SG communications systems to manage large data volumes because to the rise in wireless services and apps, which is being driven by the growing adoption of Internet interconnected Things smart devices. Moreover, our work surpasses the state of the art in that it not only tackles the problems caused by current communication systems but also provides a proactive solution that foresees and handles the growing data needs resulting from the changing wireless application and Internet of Things (IoT) landscape. The suggested hybrid design fosters adaptation and resilience in the face of rapidly advancing technology breakthroughs, marking a key step to future-proofing SG communication systems.

4. Kumar, S., Kalra, B., & Kannagi, A. (2023, December).

**The Electricity Management for Domestic Applications Through Hybrid Grid. In 2023 International Conference on Power Energy, Environment & Intelligent Control (PEEIC) (pp. 1125-1128). IEEE.**

In order to effectively manage power demand, optimize energy usage, and integrate distributed renewable energy production, home energy management systems, or HEMSs, are essential. The primary aim is to optimize energy efficiency while maintaining customer comfort. Numerous factors, including as energy prices, meteorological conditions, load the profiles, and customer comfort levels, influence how HEMSs function. They greatly reduce the amount of power used in both personal and business smart networks as they become more and more common. This study performs a comprehensive analysis of the body of research on HEMS, including key ideas, configurations, and the supporting technologies that support their operation. Giving a thorough review of the status of HEMS innovation and its uses today is the aim. The study also discusses popular communication methods used in demand management applications and analyzes current advancements in HEMS computing. The study that follows provides readers with a comprehensive overview of current and upcoming developments in HEMS technology and solutions. Presenting a polished and original synthesis of the current material while preserving its integrity and excluding any needless elaboration is the aim.

# Innovation & Research Collaboration

5. Kumar, A., Jamal, A., & Mahajan, P. (2023, December).

**Impact on Efficiency of Reactors via Bubbles. In 2023 International Conference on Power Energy, Environment & Intelligent Control (PEEIC) (pp. 1129-1132). IEEE.**

With an emphasis on battery-comparable network theories and the function of power control devices, the current study investigates the effect of bubble on the electrical energy transformation effectiveness of chemical reactors. A thorough knowledge of chemical conditions for storing is necessary because to the growing dependence on charging devices, particularly in electronics that can be carried. The models that now exist are divided into four categories by the literature review: Electrical, A number, Logical, and Point Input Systems. Each category has pros and cons of its own. The proposed approach describes in detail the electric modelling technique for lithium-polymer, lithium-ion, and nickel-metal hybrid power sources, emphasising certain characteristics for examination. The section on findings and discussion highlights the trade-off amongst reliability and system brevity, recognising the difficulties in striking a balance of computing viability and accuracy. Evaluation of batter comparable network models is now necessary due to the development of power controllers. The benefit of this kind of simulation is that it can precisely predict the kinetic properties of a charger. The goal of identifying circuit characteristics is to predict electrochemical storage conditions. The various circuit types presented in this article are taken from published books. The Metals Combination, Potassium, Lead-Acid, and Rechargeable battery varieties are examined.

6. Nachappa, M. N., Agarwal, C., & Kumar, R. (2023, December).

**Radiation Level Calculation and Energy Conversion Ratio Finding in Hybrid PV System. In 2023 International Conference on Power Energy, Environment & Intelligent Control (PEEIC) (pp. 1133-1137). IEEE.11. The Implementation of Green Technology Through Energy Management for Achieving Industry 4.0**

Technological developments in energy production and use are crucial to the shift to a future with fewer emissions and better health. Vehicle technology is impacted by a number of variables, including pollution-induced climate change, stricter environmental rules for autos, depletion of petrol and diesel supplies, and price volatility for transit systems. One of the most notable possibilities for clean automobile technology is the hybrid electric vehicle (HEV). This research explores several HEV designs and approaches, clarifying development guidelines and ways to enhance control algorithms. We also look at the various battery-powered drives that HEVs employ. Performance is the main area of study since control methods are essential to improving the fuel economy and lowering pollutants of hybrid engine systems.

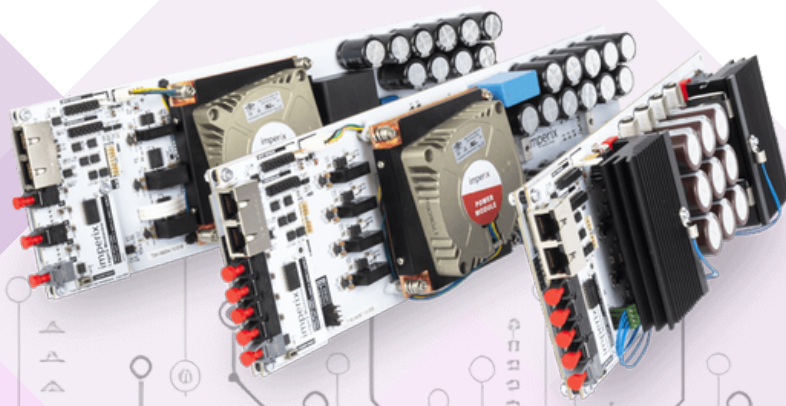


# Innovation & Research Collaboration

7. Gupta, A. K., Karthikeyan, M. P., & Batra, R. (2023, December).

**Use of Different Control Strategies to Design Converters and Inverters for Sustainable Grids. In 2023 International Conference on Power Energy, Environment & Intelligent Control (PEEIC) (pp. 1148-1153). IEEE.**

Renewable energy resources are expected to dominate the power grid in the future, posing a challenge to the grid-following (GFL) control strategies used for grid-tied converters. Regrettably, there have been shortcomings with GFL control, including poor stability and limited grid support capabilities. Novel grid-forming controllers have been developed in response to these difficulties with the goal of improving the dynamical efficiency and dependability of grid-tied converters. This paper presents a thorough analysis of many GFM control techniques, contrasting them on important fronts such control architecture, grid support capacity, fault current limitation, and overall stability. An extensive transient stability study is included in the work because it acknowledges the importance of current fault limiting techniques. The purpose of this research is to assess how well GFM control techniques mitigate transient disturbances and guarantee the power system operates robustly and steadily. By carefully examining the various strategies, the review hopes to shed light on the advantages and disadvantages of each GFM management technique, aiding in the decision of which strategy is best for a given set of circumstances. The paper also explores the useful uses of GFM converters, emphasizing their use in situations such AC micro grid configurations and the incorporation of offshore windmills via high-voltage alternating current systems. These uses highlight the GFM converters' flexibility and versatility in a range of energy infrastructure projects. The report concludes by discussing potential difficulties that GFM converters could encounter in the future. Anticipating and resolving these issues is essential to the effective integration and broad implementation of grid-forming control techniques as the energy landscape changes. Through elucidating the present condition, uses, and difficulties, this analysis advances our comprehension of the dynamic function of GFM conversions in molding the trajectory of power systems in the future.



## Innovation & Research Collaboration

8. Chandani, P., Vijay, S., & Soumya, K. (2023, December).

**The Implementation of Integration of ML Algorithm for the Design of Stability System for Grid System. In 2023 International Conference on Power Energy, Environment & Intelligent Control (PEEIC) (pp. 1154-1157). IEEE**

A modern decentralized electric grid is a groundbreaking system that integrates demand response effortlessly and doesn't need major infrastructure changes. Within the decentralized domain, users independently control their power consumption according to the frequency of the grid. This is made possible by the use of reasonably priced devices like smart meters, which allow grid frequency to be measured from almost anywhere. Different data-level resampling strategies have been used to address the problem of data imbalance, while data normalization approaches have been used to reduce biased behavior among characteristics. The findings clearly show that in terms of the performance of classifiers, a balanced dataset performs better than an unbalanced one. Specifically, for unbalanced datasets, oversampling approaches are more effective than under sampling ones. With a precision level of 94.7 percent, the XGBoost algorithm is the best performer within the range of deep learning algorithms that are taken into consideration. Remarkably, XGBoost's accuracy forecast rises to 96.8% when paired with random oversampling. This improved model manages the volatility of renewable energy supplies and maximizes their use by accurately forecasting frequency variations in decentralized power networks. This model's predictive capacities have great potential to support the stability of distributed electricity grids, which will improve the distribution and administration of energy on a larger scale.



**Machine Learning**



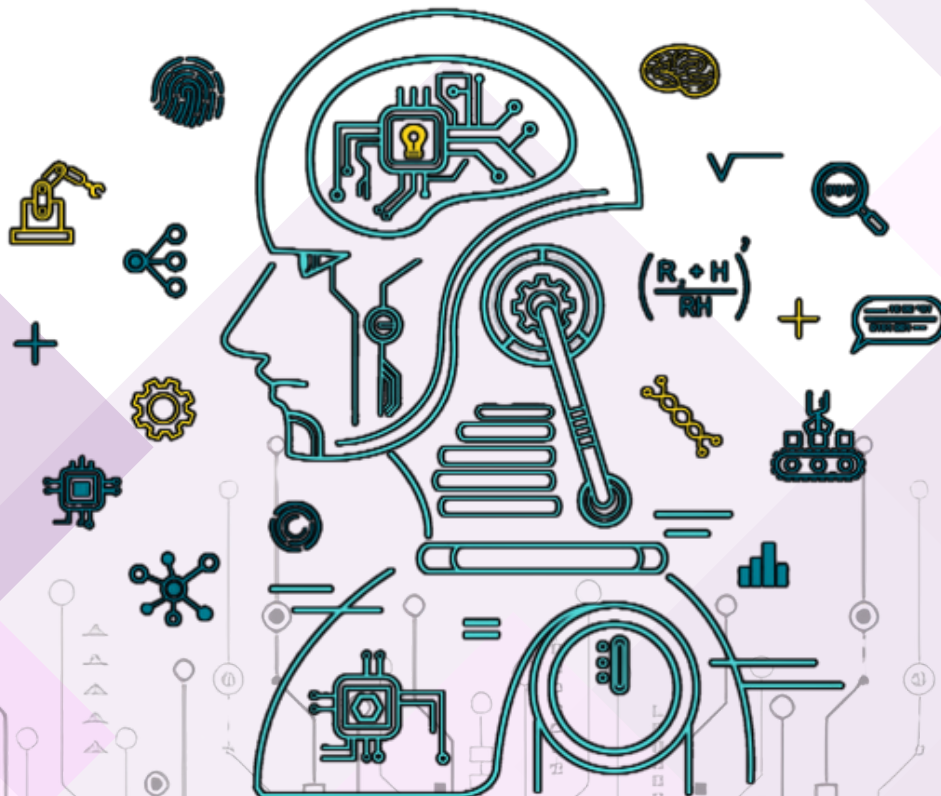
# Innovation & Research Collaboration

9. Bhardwaj, P., Kumar, Y., & Mishra, S. (2024, January).

**Machine Learning-Based Approaches for the Prognosis and Prediction of Multiple Diseases. In 2024 International Conference on Intelligent and Innovative Technologies in Computing, Electrical and Electronics (IITCEE) (pp. 1-6). IEEE.**

The rapid progress in machine learning techniques has significantly transformed healthcare which enables the simultaneous and accurate detection of multiple diseases. This paper delves into the application of diverse machine learning algorithms for multi-disease detection by using a comprehensive dataset which focuses on three diseases i.e. diabetes, gonorrhoea, and typhoid. The multi-disease dataset has been meticulously pre-processed and graphically visualized to discern patterns and represent diseases against emotional states/urges and critical feelings. Subsequently, a range of machine learning classifiers which includes logistic regression, Adaboost, random forest, support vector machine, CatBoost, Light Gradient Boosting Classifier, Naïve Bayes, XGBoost, KNN, and Decision Tree, are trained on this dataset. Their performance across these different classes is rigorously evaluated using various parameters such as accuracy, F1 score, recall, and precision. During execution, Adaboost emerged as the top performer, by achieving an impressive accuracy of 94.37% and maintaining a precision, recall, and F1 score of 0.94, which indicates its robustness in multi-disease detection.

## MACHINE LEARNING



# Innovation & Research Collaboration

Prof. (Dr) Sandip Vijay & Dr. Raghav Garg has been granted the following patents.



Dr. Sunil Semwal & Dr. Tripuresh Joshi has been granted the following patent.



# INTELLECTUAL PROPERTY INDIA

PATENTS | DESIGNS | TRADE MARKS  
GEOGRAPHICAL INDICATIONS



# Emerging Talent

Our department is humming right now because of the creative work of our students, who are working hard on projects that have the potential to have a big influence on their fields of study. These initiatives highlight our academic community's innovative spirit and dynamic learning environment, and they are being mentored by distinguished faculty members. A sneak peek at the ongoing project is as follows:

- With the "Advanced QR Print Device and Deployment,"

Pallavi Priti, Shivam Saini, Shivani Kumari, Suraj Kumar and Arpit Kumar are advancing technology under the direction of Mr. Sharad Pratap Singh.

- Under the guidance of Mr. Gaurav Mittal, Shivam Chauhan, Shana Parveen, Sneh Tiwari, Anshuka Raj Kashyap and Shivam Shukla embark on a "Deep Learning-Based Research Project" that delves into the realm of artificial intelligence.

- With the "Image Based Steganography Web application,"

Harsh Kashiwal, Vaishali Negi, Abhishek Pal and Imran Ahmad are making progress in technology under the direction of Dr. Sandeep Kumar.

- With the "Smart Crop Recommendation App,"

Ankit Rawat, Akash Patwal, Ankit Kumar and Manav are advancing technology under the direction of Dr. Sandeep Kumar.



**Digital Image Processing**



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**ARTIFICIAL  
INTELLIGENCE**

# Emerging Talent

## Innovate **24 HOUR HACKATHON** of Evaporate®

The Departmental Internal Hackathon was won by "Team Time Crafters," who put on an amazing display of creativity and talent. "Development of smart applications for academic timetable generators" is the name of their project.

Participants pushed the limits of creativity and technology during the event. Nevertheless, the winning team gained heights: "Time Crafters" created a website and an Android app prototype that, when given parameters like the number of lectures, days, etc., creates a schedule. A leave-management system with many sophisticated features was also included. There are two ways to join up: as a faculty member or as a student. Other features, including sign-up, login, logout, and alerts, were also provided.



The triumph not only signifies a noteworthy accomplishment for the Winning Team but also provides the way for their next projects, which will focus on project development. The hackathon is a prime example of the department's dedication to innovation and its function in creating the next generation of IT leaders.







# Emerging Talent

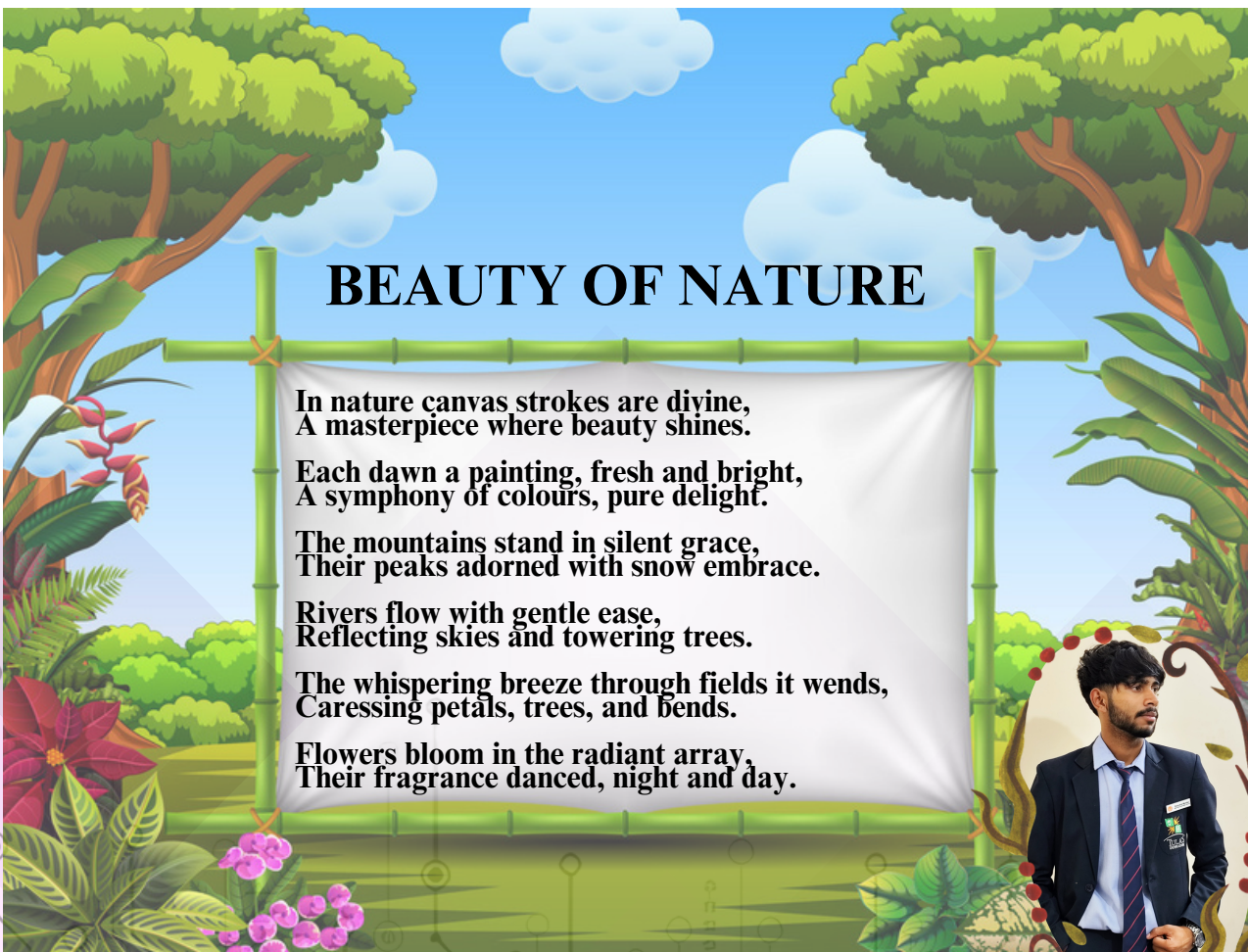
The Department extend their heartiest congratulations to our 4th Year students **Virat Kumar, Abhijeet Baloni** for earning distinguished **NPTEL Certificates**, showcasing their dedication and excellence in their respective fields.



**VIRAT KUMAR**



**ABHIJEET BALONI**



## BEAUTY OF NATURE

**In nature canvas strokes are divine,  
A masterpiece where beauty shines.**

**Each dawn a painting, fresh and bright,  
A symphony of colours, pure delight.**

**The mountains stand in silent grace,  
Their peaks adorned with snow embrace.**

**Rivers flow with gentle ease,  
Reflecting skies and towering trees.**

**The whispering breeze through fields it wends,  
Caressing petals, trees, and bends.**

**Flowers bloom in the radiant array,  
Their fragrance danced, night and day.**

**ABHINAV SINGHAL**



# Emerging Talent

पुरषोत्तम होना असंभव है ?

ईश्वर भी मनुष्य बन दुखी हो, क्या संभव है ?  
पुरुष होना कठिन परंतु, पुरषोत्तम होना असंभव है ।

आओ चलो आज राम की बात करते है ।  
जो सबके मन की पीड़ा को हरते है ॥

जिन्हें स्वयं निरर्थक यातना का बोध था ।  
परंतु भय जीवन संगनी का वियोग था ॥

जो वचन किया वो हृदय से निभाया भी ।  
कही शीश काटे मगर कही स्वयं मस्तक झुकाया भी ॥

जिस प्रेम के खातिर लंका तक तार गए ,  
कर्तव्यों के समुख वह प्रेम भी हार गए ।

ठान लेते हो दृढ होकर तो सब अपना होता ।  
फिर सारी श्रृष्टि होती चरणों में फिर क्या वास्तविकता क्या सपना होता ॥

जहां शीतलता के अमुख पौरस भी संभव है ।  
पुरुष होना कठिन परंतु पुरषोत्तम होना असंभव है ॥



RISHABH KUMAR MANDAL

GAURAV SHRIVASTAV



मुट्टी भर बचपन

मुट्टी भर बचपन के खिलौने,  
खेलों की छाँव में लिपटे सपने।

छोटी-छोटी कहानियों का संग,  
बचपन की धूप में जलती है तृप्ति।

उड़ते हैं विमान, चलते हैं गाड़ी,  
मिट्टी के घरों में बसती खुशियाँ साथी।

गुड़ियों की मुस्कान, पिंजरों की चहक,  
हर रोज़ नए खेल, नए धमाल और बहार।

प्यार की बूंदें बरसाते हैं माँ-बाप,  
बचपन के रंग में रंगते हैं सब अभिलाष।

छोटी बच्ची की हँसी, छोटे बच्चे का रोना,  
जीवन की छोटी सी कहानी, बचपन की रोशनी।

मुट्टी भर बचपन की यादें,  
बचपन की नादानी, खुशियों का खजाना।

बचपन की लगन, बचपन का सफ़र,  
जीवन की प्रेरणा, बचपन की परीक्षा।

मुट्टी भर बचपन की धूप और छाँव,  
खाँजते हैं हमें, खो गया बचपन कहाँ।

## Emerging Talent

### चल इंसानियत बचाने को थोड़ा इंसान बन जाते हैं

किसी अंधेरी दुनिया में चल उजाला भर जाते हैं  
हो जरूरत गर किसी को चल हाथ हम बढ़ाते हैं

वजह टूट कर जिंदगी जीने का सलीका आता है  
चल बेवजह किसी के होठों पर मुस्कान लाते हैं

हैं पास पास पर दिल में दूरी इस लंबे चौड़े शहर में  
चल थोड़ा सा अपना गाँव इस शहर में भी लाते हैं

माना प्रतिस्पर्धा बहुत यहाँ और समय बहुत ही कम  
बैंक बैलेंस की फिक्र छोड़ थोड़ी जिंदगी जी जाते हैं

माना वो थोड़ा हकलाता और बात कर रहा हिंदी में  
चल छोड़ के अपनी अंग्रेजी उसकी झिझक मिटाते हैं

तो क्या हुआ फैशन सेंस नहीं पर है तो हममें से ही वो  
चल बिना किसी जजमेंट के उसको अच्छा फील कराते हैं

माना उसने है नहीं बांधी कोई राखी तेरी कलाई पर  
देख मुसीबत उस पर चल उसका भाई बन जाते हैं

छोड़ के लालच घृडा जलन हिंसा और अहंकार को  
चल इंसानियत बचाने को थोड़ा सा इंसान बन जाते हैं

माना कलयुग है चरम पर और पाप हर तरफ फैला है  
चल खुद से शुरू करके कलयुग में ही सतयुग लाते हैं



DR. ANAND GUPTA  
HOD, CSE

# Emerging Talent

## Unleashing Your Creative Potential: Understanding the Human-Made Pathways to Creativity

Creativity is an extraordinary gift inherent in all of us, waiting to be nurtured and unleashed. Delving into the human-made pathways of creativity unveils a fascinating journey of self-discovery and innovation, illuminating the psychology behind our creative endeavors. At its essence, creativity transcends mere artistic expression; it encompasses the art of problem-solving, the finesse of critical thinking, and the courage to explore uncharted territories of imagination. Psychologists have long been captivated by the intricate mechanisms that drive creative thinking, unveiling a tapestry of insights that illuminate our path to unlocking creativity's full potential. Central to this journey is divergent thinking—a cognitive dance that liberates us from the constraints of linear thought, inviting us to explore myriad perspectives and generate a profusion of solutions. This capacity to think beyond the confines of conventionality empowers us to reimagine the world around us and breathe life into novel ideas. Yet, creativity's allure extends beyond external accolades or recognition; it resides in the pulsating rhythm of intrinsic motivation—the inner flame that propels us to embark on creative odysseys fueled by passion and curiosity. When driven by this internal fire, we transcend the confines of self-doubt and societal expectations, embracing our creative essence with unwavering determination. Moreover, the environment in which creativity thrives serves as a nurturing cocoon, fostering a culture of experimentation, risk-taking, and collaborative exploration. In this fertile soil, seeds of innovation take root, blossoming into vibrant expressions of human ingenuity. But the journey of creativity is not without its twists and turns, for failure often intertwines with success, guiding us along the winding path of discovery. Embracing failure as a cherished companion, rather than a foe, imbues us with resilience and fortitude, propelling us forward in our quest for creative excellence. Furthermore, cultivating a growth mindset—a steadfast belief in our capacity to learn and evolve—propels us ever onward, transforming setbacks into stepping stones and challenges into opportunities for growth. In essence, understanding the human-made pathways to creativity is akin to embarking on a sacred pilgrimage—a journey of self-discovery, innovation, and boundless potential. By embracing divergent thinking, nurturing intrinsic motivation, cultivating conducive environments, embracing failure, and fostering a growth mindset, we unlock the gates to a realm where creativity reigns supreme, illuminating our path with the brilliance of a thousand suns.



**MADHULIKA  
CHAUDHARY**



# Placement Opportunities

**TULA'S NAAC A+**

## 29th CAMPUS PLACEMENT DRIVE

Name of company:  
**RELIANT REALTY**

Eligible Course:  
B.TECH ALL BRANCH, MBA, MCA 2024 BATCH

Date of Drive:  
**31 Jan 2024**

Package:  
**5.12LPA**

Call to find out more  
91-6366937159

www.tulas.edu.in  
VISIT OUR WEBSITE

**TULA'S NAAC A+**

## 31st CAMPUS PLACEMENT DRIVE

Name of company:  
**de facto.**

Eligible Course:  
B.TECH CSE,ECE,BCA,MCA,BBA, MBA,B.COM(HONS)

Date of Drive:  
**15 Feb 2024**

Package:  
**4 LPA**

Call to find out more  
91-6366937159

www.tulas.edu.in  
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**TULA'S NAAC A+**

Welcomes

## Yhills

Learning Beyond Expectations

for  
**32nd Campus Placement Drive**

Date of Drive: 16 Feb 2024	Eligible Course: B.Tech All Branch, BCA, MCA, BBA, MBA, B.Com(Hons), BAJMC	Package: 7.25 LPA
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Call to find out more  
91-6366937159

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**TULA'S NAAC A+**

Welcomes

## Bayone BAYONE

for  
**33rd Campus Placement Drive**

Date of Drive: 20 Feb 2024	Eligible Course: B.Tech CSE,ECE, EEE,BCA, MCA	Package: 3 LPA
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**TULA'S NAAC A+**

Welcomes

## Aspirefox

for  
**35th Campus Placement Drive**

Date of Drive: 08 March 2024	Eligible Course: B.Tech CSE and MCA 2024 Batch
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91-6366937159

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**TULA'S NAAC A+**

Welcomes

## CapitalVia Group

for  
**36th Campus Placement Drive**

Date of Drive: 15 March 2024	Eligible Course: B.Tech CSE & MBA	Package: 3 LPA
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**TULA'S NAAC A+**

Welcomes

## Centilytics

for  
**37th Campus Placement Drive**

Date of Drive: 22 March 2024	Eligible Course: B.Tech CSE,MBA,MCA	Package: 10LPA
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Call to find out more  
91-6366937159

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## Future Announcements

