KSR College of Engineering

AN AUTONOMOUS INSTITUITION

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BYTE BEAT

DEPARTMENT OF INFORMATION TECHNOLOGY

VISION OF THE INSTITUTE

We envision to achieving status as an excellent educational institution in the global knowledge hub, making self-learners, experts, ethical and responsible engineers, technologies, scientists, managers, administrators, and entrepreneurs who will significantly contribute to research and environment-friendly sustainable growth of the nation and the world.

MISSION OF THE INSTITUTE

To inculcate in the students' self-learning abilities that enable them to become competitive and considerate engineers, technologists, scientists, managers, entrepreneurs, and administrators by diligently imparting the best of education, nurturing environmental and social needs. To foster and maintain a mutually beneficial partnership with global industries and Institutions through knowledge sharing, collaborative research, and innovation.

VISION OF THE DEPARTMENT

To produce excellent and competent software professional, researchers and responsible engineers, who can significantly contribute to environment friendly societal industry through quality education.

MISSION OF THE DEPARTMENT

- To make the students competitive and efficient in technical field through technological transformations' in Information Technology, by providing them advanced curriculum, infrastructure and nurturing human values.

- To provide an excellent forum for higher studies that leads to careers as Computer and IT professionals in the widely diversified domains of industry, government and academia.

Message from CHAIRMAN

Thiru. R. SRINIVASAN, B.B.M., MISTE
Chairman

I am pleased to witness the launch of Byte Bate the official magazine of the Information Technology Department at K.S.R. College of Engineering. In today's rapidly evolving digital landscape, it is inspiring to see the department taking proactive steps to keep students informed, engaged, and future-ready through such academic and creative endeavors. This newsletter serves as a vibrant platform to highlight the department's achievements in academics, research, student innovations, and industry interactions. It is a reflection of the commitment of the faculty and students towards excellence in the field of Information Technology.

I commend the department for its consistent efforts in nurturing young minds and cultivating an environment of inquiry, innovation, and integrity. My heartfelt congratulations to the editorial team for bringing out this issue and my best wishes for continued success in all future initiatives.

With best wishes
Mr. R. SRINIVASAN
Chairman
KSR Educational Institutions

Message from PRINCIPAL

Dr. M. VENKATESAN, M.E., Ph.D.,
Principal

It is with great pleasure that I share the latest edition of the IT Department Byte Bate magazine , which showcases the remarkable progress, initiatives, and accomplishments of our students and faculty. Over the years, KSR College of Engineering has established itself as a hub of academic excellence, nurturing generations of aspiring engineers with a strong foundation in knowledge and innovation. Our department continues to strive toward excellence through dynamic teaching practices, robust research activities, and active student engagement. This magazine is a testament to our collective efforts in embracing new technologies, promoting creativity, and fostering a culture of continuous learning. I commend the faculty, students, and the editorial team for their commitment and hard work in bringing out this informative and inspiring edition. I am confident that this publication will serve as a source of motivation for all, driving us toward even greater achievements in the future.

With best wishes
Dr. M. Venkatesan
Principal

Message from HoD

Dr. S. ANGURAJ., M.E.,Ph.D.
Associate Professor & Head
Information Technology

As the Head of the Department of Information Technology, I am delighted to collaborate with our dedicated faculty and enthusiastic students in bringing out this newsletter that showcases the activities and accomplishments of our department in a well-organized manner. This edition highlights our recent initiatives, including seminars, workshops, research publications, student projects, and industry collaborations. I also take this opportunity to extend my heartfelt gratitude to our esteemed alumni and industry partners, whose continued support and active engagement play a vital role in the growth and success of our department.

With best wishes
Dr. S. Anguraj
Associate Professor & Head
Information Technology

BYTE BATE

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Enhancing Efficiency of Plant Disease And Pest Detection With Prevention Using Deeplabv3+ With Multimodal Data Fusion And Explainable AI

The study aims to develop an advanced plant disease and pest detection system using DeepLabV3+ and CNN algorithms, integrated with multimodal data fusion and Explainable AI (XAI). Materials and Methods: This study aims to improve the effectiveness in detecting plant disease and pests by comparing CNN algorithm and CNN + Deeplabv3+ based accuracy, response time and error rate Group 1: Uses for plant disease and pest detection but has lower accuracy (86%) and slower response times. Group 2: Uses advanced AI with DeepLabV3+, CNN, multimodal data fusion, and XAI for faster, more accurate detection (97%), and better prevention. The G Power value is 80% with a 95% confidence interval and a 0.05% significance threshold. Result: The DeepLabV3+ and CNN-based systems achieved significantly higher detection accuracy (87.5%–98.7%) than traditional methods (65.5%– 78.2%). It also demonstrated superior efficiency and prevention effectiveness for complex datasets, with a significance value of about 0.025. The DeepLabV3+ and CNN-based systems outperform the CNN algorithm in accuracy, efficiency, and early disease prevention. In this work, it is noted that the CNN and Deeplabv3+ have a much faster and more efficient plant disease and pest identification rate than the only CNN approach, with better accuracy, response rate, and low error rate.

IT / IV-Year

I. Santhosh Kumar S

II. Yuvansandhar R

III. Ravikiran G

Discrete Wavelet Transform for Secure Image Embedding in IoT

The study aims to improve and apply the use of Discrete Wavelet Transform (DWT) for secure image embedding in Internet of Things (IoT) from Least Significant Bit (LSB). The goal is to develop a method for embedding private information, such as secret data or watermarks, in images with minimal alteration and high security. The study involves Least Significant Bit (LSB) existing method, which is implemented in the method for secure image embedding. Implementation of Discrete Wavelet Transform (DWT) for secure image embedding. Images are divided into several frequency sub-bands, including low-frequency (LL) and highfrequency components (LH, HL, HH), using a 2D Discrete Wavelet Transform (DWT). The Discrete Wavelet Transform (DWT) demonstrates significantly better performance in terms of image quality, data embedding capacity, robustness, and security compared to the Least Significant Bit (LSB) method. Metrics such as PSNR and SSIM show superiority in image steganography performed using DWT. The study concludes that the Discrete Wavelet Transform (DWT) offers a highly compressible and robust solution for secure image embedding, outperforming the Least Significant Bit (LSB) method.

IT / IV-Year

I.Nithish N

II. Saran M S

III. Vipin S

Enhanced Parking Occupancy Prediction Using CNN in Machine Learning

The exponential growth in urban vehicle usage has posed significant challenges to smart city infrastructure, particularly in efficient parking management. To address these concerns, *Convolutional Neural Networks (CNN)*—a class of deep learning algorithms primarily used in image recognition—are being increasingly applied to predict parking occupancy with high accuracy and speed. Traditional parking systems often rely on sensor-based or manual input, which can be inefficient, costly, and prone to inaccuracies. CNN-based approaches offer a transformative solution by utilizing real-time camera feeds and satellite imagery to determine parking space availability. These models extract spatial and temporal features from visual data to distinguish between occupied and unoccupied parking slots, thus enhancing prediction accuracy. In the proposed system, preprocessed images from surveillance cameras are fed into a trained CNN model, which classifies the status of each parking spot. The model is trained on a large dataset that includes diverse lighting conditions, vehicle sizes, and weather scenarios to ensure robustness. Additionally, data augmentation and transfer learning techniques are incorporated to improve generalization and reduce overfitting.

The results demonstrate that CNN models outperform traditional machine learning techniques like SVM and decision trees in terms of prediction accuracy, response time, and scalability. Furthermore, the integration of CNN with IoT-enabled infrastructure and cloud-based services allows real-time updates to end-users through mobile applications or digital signage. In conclusion, the use of CNN for parking occupancy prediction not only streamlines urban mobility but also contributes to reduced traffic congestion, lower carbon emissions, and improved user satisfaction. This innovative application of machine learning holds great promise for the development of intelligent transport systems and future-ready smart cities.

IT / IV-Year
G.Gokulapriya
R.Brindha
J.Javith Ahamed

Optimized Li-Fi System for High-Security, Energy-Efficient Data Transfer with Laser Photodiode Technology

Light Fidelity (Li-Fi) is an emerging wireless communication technology that uses visible light for data transmission, offering a secure, high-speed alternative to traditional radio-frequency systems like Wi-Fi. This paper presents an optimized Li-Fi system integrated with laser photodiode technology to enhance data transfer efficiency, security, and energy usage.The proposed system employs laser diodes as transmitters and photodiodes as receivers, allowing focused, high-intensity light beams to transmit large volumes of data at extremely high speeds. Compared to conventional LEDs, laser diodes offer narrower beam divergence, higher modulation rates, and better directionality, making them ideal for point-to-point communication. At the receiving end, advanced photodiodes are used to capture the laser signals with minimal latency and noise interference. One of the major advantages of this setup is enhanced security. Since light cannot penetrate opaque walls, Li-Fi communication remains confined to a physical space, significantly reducing the risk of data interception. This makes the system particularly suitable for high-security environments such as defense, research labs, financial institutions, and smart healthcare setups.

Additionally, the laser-based Li-Fi system is highly energy-efficient, utilizing less power to transmit data over short distances with superior bandwidth. The use of intelligent modulation techniques and adaptive beam alignment further minimizes energy consumption while maintaining stable connectivity. In performance tests, the system demonstrates superior throughput, low latency, and strong resistance to electromagnetic interference. The integration of this technology into smart building systems and industrial networks can pave the way for ultra-fast, eco-friendly, and secure data communication. In summary, the optimized Li-Fi system with laser photodiode technology represents a promising leap toward futuristic communication networks that prioritize security, efficiency, and sustainability.

IT / IV-Year
Hari Prasath S
Dayanidi G V
Darunika B

Evaluation of Feature Transformation and Machine Learning Models on Early Detection of Diabetes Mellitus

Early detection of diabetes mellitus is imperative to decreasing complications and improving patient prognosis. In this study, we analysed the machine learning models and feature transformation techniques to predict diabetes at initial stages. This research tackles the significant issues of accuracy, scalability, and interpretability, using sophisticated techniques like feature engineering, hybrid models, and non-invasive signal processing. Although several of the comparative analyses reinforce the advantages of customized methods for certain diabetes classes, other novel techniques such as transformer-based models and ensemble learning have proven extensive improvements in prediction accuracy. With synthetic data and heterogeneous datasets, the proposed model maintains good generalizability in various clinical scenarios. It helps to reduce the disconnect between academia and industry, offering diabetes prevention and management solutions that can be scaled and implemented across healthcare settings.

IT / IV-Year

I.K. S. Nishanth

II. M. Pradeep Sudharshan

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KSR KALVI NAGAR, TIRUCHENGODE.

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