SI NO	**Abstract**
1	Brain hemorrhage, a type of stroke caused by an artery in the brain bursting and causing localized bleeding in the surrounding tissues, is a critical medical condition requiring prompt diagnosis and treatment. The detection of brain hemorrhages has been significantly improved by advances in medical imaging technologies. However, the accurate and rapid interpretation of these images remains challenging. This study explores a deep learning and machine learning approach for brain hemorrhage detection, comparing their effectiveness and efficiency. Using a dataset of brain imaging scans, we implemented Convolutional Neural Networks (CNN) and Random Forests (RF). The results demonstrate the potential of these techniques in enhancing diagnostic accuracy and providing timely intervention.
2	In recent years, unmanned aerial vehicles (UAVs) have revolutionized various fields including agriculture, surveillance, and disaster management due to their capability to capture high-resolution images from different perspectives. Detecting dense and small objects in these images poses a significant challenge due to their size and context variability. This project proposes an method leveraging YOLO v8, an advanced variant of the You Only Look Once (YOLO) object detection algorithm, tailored for detecting dense and small objects in UAV images. Our approach integrates several innovative techniques to enhance object detection accuracy. Firstly, a novel data augmentation strategy is employed to enrich the dataset and improve the model's ability to generalize across diverse conditions. Secondly, feature pyramid networks are incorporated to enable the model to detect objects at multiple scales, crucial for identifying small objects amidst complex backgrounds. Furthermore, a refined loss function is introduced to prioritize detection performance for dense arrangements of objects, ensuring robustness against cluttered environments. Experimental results demonstrate the efficacy of our method compared to existing approaches, achieving superior performance in terms of detection accuracy and computational efficiency. The proposed framework not only enhances object detection capabilities but also contributes to advancing UAV-based applications in various domains.
3	This Study explores Detecting and recognizing objects are crucial stepsin interpreting remote sensing images. At present, deep learning methods are predominantly employed for detecting objectsin remote sensing images,necessitating a significant number of floating-point computations. However, low computing power and small storage in computing devices are hard to afford the large model parameter quantity and high computing complexity. To address these constraints, this article presents a lightweight detection model called CSPPartial-YOLO. This model introduces the partial hybrid dilated convolution (PHDC) Block module that combineshybrid dilated convolutions and partial convolutions to increase the receptive field at a low computational cost. Coordinate attention module is also employed in CSPPartialStage to aggregate position information and improvethe detection of small objects with complex distributions in remote sensing images. A backbone and neck are developedwith CSPPartialStage, and the rotation head of the PPYOLOE-R model adapts to objects of multiple orientations in remote sensing images. Empirical experiments using the dataset for object deTection in aerial images (DOTA) dataset.

4	This study explores ship object detection using Convolutional Neural Networks (CNN), YOLOv5, and YOLOv8, evaluating their performance based on accuracy, error rate, and execution time. CNNs, known for their robust image processing capabilities, provide a foundational approach but often suffer from longer execution times due to their complex architecture. YOLOv5, an advanced real-time object detection model, balances accuracy and speed, offering a streamlined approach with significant improvements in execution time and error reduction compared to traditional CNNs. The latest iteration, YOLOv8, further refines these capabilities, enhancing accuracy and reducing error rates through improved network structures and optimization techniques.
5	Detection of landslides from remote sensing images is crucial for disaster management and environmental monitoring. This study introduces LS-YOLO, a novel model tailored for detecting multiscale landslides using remote sensing imagery. Inspired by the YOLOv8 architecture, LS-YOLO integrates state-of-the-art object detection techniques with domain-specific enhancements to address the challenges inherent in landslide detection. Multiscale features captured by YOLOv8 are leveraged to effectively identify landslides across various spatial resolutions. The model is trained on a comprehensive dataset of remote sensing images annotated with landslide instances. Through extensive experimentation, LS-YOLO demonstrates superior performance in terms of accuracy, speed, and scalability compared to existing methods. Results showcase LS-YOLO's ability to accurately detect landslides of different sizes and shapes, making it a valuable tool for disaster response and land management applications. LS-YOLO represents a significant advancement in the field of landslide detection, offering a robust solution for monitoring and analyzing landslide phenomena using remote sensing technology.
6	Precipitation nowcasting refers to the prediction of small-scale precipitation events at minute and kilometer scales within the upcoming 0 to 2 hours, significantly impacting both human activities and daily life. However, prevailing deep learning models have primarily focused on a single radar echo data source, limiting their ability to effectively capture intricate and rapidly evolving precipitation patterns. To address this limitation, meteorological satellite data is considered to supplement radar echo data. To achieve a comprehensive integration of multisource data with enhanced details, we propose a two-stage fusion satellite and radar GAN-based prediction network (named FsrGAN). In the first stage, we design a satellite-radar fusion prediction network known as FsrNet. This network employs an encoder-fusion-decoder architecture, where a novel spatial-channel attention (SCA) mechanism enhances the filtering and fusion of multisource and multiscale features. In the second stage, we introduce a GAN-based network (FusionGAN) that further mines the complementary information of satellite images to sharpen the first-stage predicted radar maps with more details. Experiments conducted on a meteorological dataset from the Yangtze River Delta (YRD) region demonstrate the notably superior performance of our model in terms of image quality and precipitation forecasting metrics compared to traditional optical flow-based methods and well-known deep learning methods (ConvLSTM, ConvGRU, TrajGRU, and PredRNN++). More importantly, our fusion model using satellite and radar data effectively predicts convective initiation.

7	Emotion recognition using EEG signals has gained significant attention in recent years due to its potential applications in various fields such as healthcare, human-computer interaction, and affective computing. However, the accuracy and efficiency of existing EEG-based emotion recognition systems still pose challenges. In this study, we propose an Attention-Based Hybrid Deep Learning Model for EEG Emotion Recognition, which combines the strengths of deep learning and attention mechanisms to improve the accuracy and robustness of emotion recognition from EEG signals. The proposed model demonstrates promising results in recognizing emotions from EEG data, paving the way for enhanced human-machine interaction and emotion-aware systems.
8	Big data has the ability to open up innovative and ground-breaking prospects for the electrical grid, which also supports to obtain a variety of technological, social, and financial benefits. There is an unprecedented amount of heterogeneous big data as a consequence of the growth of power grid technologies, along with data processing and advanced tools. The main obstacles in turning the heterogeneous large dataset into useful results are computational burden and information security. The original contribution of this paper is to develop a new big data framework for detecting various intrusions from the smart grid systems with the use of AI mechanisms. Here, an AdaBelief Exponential Feature Selection (AEFS) technique is used to efficiently handle the input huge datasets from the smart grid for boosting security. Then, a Kernel based Extreme Neural Network (KENN) technique is used to anticipate security vulnerabilities more effectively . In this process, CICIDS-2017 was taken from dataset repository. Then, we have to implement the pre-processing, data splitting and classification. Finally, the experimental results shows that the performance metrics such as accuracy, precision and recall.
9	The e-commerce industry's rapid growth, accelerated by the COVID-19 pandemic, has led to an alarming increase in digital fraud and associated losses. To establish a healthy e-commerce ecosystem, robust cyber security and anti-fraud measures are crucial. However, research on fraud detection systems has struggled to keep pace due to limited real-world datasets. Advances in artificial intelligence, Machine Learning and cloud computing have revitalized research and applications in this domain. While ML and data mining techniques are popular in fraud detection, specific reviews focusing on their application in e-commerce platforms like eBay and Facebook are lacking depth. Existing reviews provide broad overviews but fail to grasp the intricacies of ML algorithms in the e-commerce context . So for identifying the intrusion we have designed the different machine learning algorithms such as KNN,LR. The experimental results shows that the accuracy algorithms. In this process, E-Commerce Fraud Detection was taken from dataset repository.

10	"This study explores ship object detection using Convolutional Neural Networks (CNN), YOLOv5, and YOLOv8, evaluating their performance based on accuracy, error rate, and execution time. CNNs, known for their robust image processing capabilities, provide a foundational approach but often suffer from longer execution times due to their complex architecture. YOLOv5, an advanced real-time object detection model, balances accuracy and speed, offering a streamlined approach with significant improvements in execution time and error reduction compared to traditional CNNs. The latest iteration, YOLOv8, further refines these capabilities, enhancing accuracy and reducing error rates through improved network structures and optimization techniques. "
11	Accurate forecasting of energy consumption is essential for efficient resource allocation, grid management, and sustainable energy planning. A novel approach leveraging Stacked Long Short-Term Memory (LSTM) networks combined with the Snapshot Ensemble technique is proposed for energy consumption prediction. The Stacked LSTM architecture enables capturing complex temporal dependencies in energy consumption data, while the Snapshot Ensemble technique enhances the model's generalization capabilities and robustness. The methodology involves training multiple Stacked LSTM models with varying initializations and snapshots of the training process. By ensembling predictions from these diverse models, improved accuracy and reliability in energy consumption forecasting are achieved. Experiments conducted on real-world energy consumption datasets evaluate the performance of the approach against baseline models and state-of-the-art techniques. The results demonstrate that the Stacked LSTM Snapshot Ensemble method outperforms existing approaches in terms of prediction accuracy, especially in handling non-linear and dynamic patterns present in energy consumption data. Furthermore, sensitivity analysis investigates the impact of different hyperparameters and model configurations on predictive performance.
12	Grid-based recommendation algorithms traditionally view users and items as abstract nodes, relying on selection relationships between these entities to make recommendations. However, this approach often overlooks valuable information, leading to less accurate recommendations. Our paper proposes enhancements to the standard substance diffusion algorithm by incorporating the influence of user ratings on recommended items, introducing a moderating factor, and optimizing the initial resource allocation vector and resource transfer matrix within the recommendation framework.The proposed algorithm improves recommendation accuracy by taking into account the user's rating behavior, thereby refining the diffusion process. A moderating factor is introduced to adjust the impact of individual user ratings on the recommendation results, ensuring that high and low ratings are appropriately weighted. Additionally, the optimization of the initial resource allocation vector and resource transfer matrix ensures a more efficient and effective distribution of recommendation resources.To quantify user satisfaction with the recommendation results, an average ranking score evaluation index is introduced. This metric provides a more nuanced assessment of recommendation quality compared to traditional metrics.Experiments conducted on the MovieLens training dataset demonstrate that the proposed algorithm significantly outperforms classical collaborative filtering systems and network structure-based recommendation systems. The experimental results indicate superior performance in terms of recommendation accuracy and hit rate, validating the effectiveness of the proposed enhancements.

13	The AIROGS challenge focuses on enhancing the accuracy and robustness of glaucoma screening through advanced artificial intelligence techniques. Our approach leverages the power of two state-of-the-art convolutional neural network architectures: ResNet and MobileNet. ResNet's deep residual learning framework addresses the vanishing gradient problem, enabling the model to learn intricate features and patterns associated with glaucoma from large-scale retinal imaging datasets. This synergy enhances the robustness of the screening process, ensuring reliable detection across diverse populations and varying imaging conditions. Our solution also incorporates advanced pre-processing techniques and data augmentation to improve generalization and reduce overfitting, ensuring consistent performance in real-world clinical settings.
14	Machine Learning (ML), which is occurring in numerous domains that require effective and efficient data classification, is growing in popularity for network monitoring and control. We can state that ML algorithms are more appropriate for use in the centralised control plane of contemporary networks due to their complexity; nevertheless, they also rely significantly on data, which must be gathered in the data plane. The unavoidable outcome is that there may be a need to move large amounts of data from the data plane to the control plane, which could potentially clog the control communication channel. Designing systems that may minimise the interaction between data and control planes while maintaining acceptable monitoring performance is therefore crucial. By preprocessing traffic data at line rate, the most current generation of data plane programmable switches that support the P4 language can lessen this issue. In this work, we adopt this strategy and suggest P4RTHENON: an architecture that gathers pertinent data in the data plane and mirrors it to the control plane, where sophisticated analysis can be carried out. P4RTHENON reduces the interface between the data and control planes while maintaining high monitoring performance by utilizing P4-native support for runtime data plane pipeline reconfiguration. We used the volumetric DDoS detection use case to test our scheme In comparison to a pure control-plane-based solution, P4RTHENON guarantees low memory usage in the data plane, decreases the volume of exchanged data by over 75%, and does not deteriorate the overall.

15	Network service providers have shown a strong interest in using automated network operations that combine software-defined networking (SDN), machine learning (ML), and network functions virtualization (NFV) in order to create sustainable networking. Under resource limitations on nodes and connections, the goal of the service chaining (SC) problem is to build an acceptable service path from an origin node to a destination node where the VNFs are executed at intermediate nodes in the required order. Traffic forwarding between VNFs is made possible by SDN through programmable configurations on forwarding devices, such as switches and routers. We approached the SC problem as an integer linear programme (ILP) in our earlier work using the shortest path tour problem (CSPTP), a more complex form of SPTP with extra limitations on connection and node capacities. In addition, we created Lagrangian heuristics to address the issue by taking into account the trade-off between computational cost and optimality. In this paper, we present a graph neural network (GNN) paired with a deep reinforcement learning (DRL) framework to realise CSPTP-based SC that can adjust to changes in network topology or service demand. Based on numerical results, the suggested framework outperforms the traditional deep Q-Network based method in achieving almost ideal SC at a faster learning rate. Furthermore, it demonstrates competitive performance against the ILP solutions in most of the 243 real-world topologies and works effectively in the face of fluctuations in service demand.
16	This study focuses on analysing user reactions to Facebook posts through a gender-based lens, employing advanced machine learning algorithms to discern patterns and differences in responses. The primary objective is to understand how male and female users react to Facebook comments, leveraging two sophisticated machine learning models: a Random Forest classifier and a hybrid model combining Logistic Regression and Decision Tree classifiers. The performance of these models is evaluated using standard metrics: accuracy, precision, recall, F1-score, and error rate. This analysis has significant implications for social media platforms and marketers, enabling tailored content strategies that resonate with specific gender demographics.
17	In our research, we aim to refine the process of identifying the intentions of transfemoral amputees who use powered knee prostheses. This task involves analyzing intricate sensor data to discern the user's movements and actions. To achieve this, we employ two cutting-edge optimization techniques: Binary Bat Optimization (BBO) and Grey Wolf Optimization (GWO). BBO facilitates the extraction of key features from the sensor data, allowing us to focus on the most relevant information for classification. This step is crucial for enhancing the accuracy and efficiency of our intent recognition system. Following feature extraction, GWO is utilized to fine-tune the parameters of our classification models, specifically the Extreme Learning Machine (ELM) and Random Forest algorithms. By optimizing these parameters, we ensure that our classifiers can effectively distinguish between different user intentions with high precision and reliability.

18	Emotion recognition from EEG (electroencephalography) signals is a challenging yet promising area of research, with applications ranging from mental health monitoring to adaptive human-computer interactions. Traditional approaches, such as those using Random Forest algorithms, have shown potential but often fall short in effectively capturing the complex temporal and spatial patterns inherent in EEG data. In this study, we propose a novel framework employing Multi-Scale Masked Autoencoders (MSMAE) combined with Convolutional Neural Networks (CNNs) for cross-session emotion recognition. Utilizing the Seed IV EEG dataset, our method leverages the multi-scale feature extraction capabilities of MSMAE to handle varying signal frequencies and the powerful pattern recognition abilities of CNNs to enhance classification accuracy.
19	Integrated sensing and communication (ISAC) is envisioned as a key pillar for enabling the upcoming sixth generation (6G) communication systems, requiring not only reliable communication functionalities but also highly accurate environmental sensing capabilities. In this paper, we design a novel networked ISAC framework to explore the collaboration among multiple users for environmental sensing. Specifically, multiple users can serve as powerful sensors, capturing back scattered signals from a target at various angles to facilitate reliable computational imaging. Centralized sensing approaches are extremely sensitive to the capability of the leader node because it requires the leader node to process the signals sent by all the users. To this end, we propose a two-step distributed cooperative sensing algorithm that allows low-dimensional intermediate estimate exchange among neighboring users, thus eliminating the reliance on the centralized leader node and improving the robustness of sensing. This way, multiple users can cooperatively sense a target by exploiting the block-wise environment sparsity and the interference cancellation technique. Furthermore, we analyze the mean square error of the proposed distributed algorithm as a networked sensing performance metric and propose a beamforming design for the proposed network ISAC scheme to maximize the networked sensing accuracy and communication performance subject to a transmit power constraint. Simulation results validate the effectiveness of the proposed algorithm compared with the state-of-the-art algorithms.
20	The system presents a sophisticated deep learning approach for accurately determining eye blink completeness. Utilizing a Long-Term Recurrent Convolutional Network (LRCN), the model processes input sequences of blink images, capturing both open and closed eye states. This hybrid model, combining convolutional neural networks (CNNs) for spatial feature extraction and long short-term memory (LSTM) networks for temporal sequence learning, enables precise analysis of blink dynamics. The Eye-LRCN algorithm is evaluated based on key performance metrics, including accuracy, error rate, and execution time, showcasing its effectiveness and efficiency. The model predicts whether a blink has occurred and classifies the eye state into categories: open eye, closed eye, looking forward, and partial blink.

21	Drowsiness of drivers is one of the main reasons behind road accidents. It is natural for the drivers who take long drives to doze off behind the steering wheel. Drowsiness and fatigue detection are critical for ensuring safety in various domains, such as driving, aviation, and industrial operations. This paper presents a deep learning approach to detect drowsiness and fatigue in using LAnet, a convolutional neural network (CNN) specifically designed for analyzing facial features and eye positions. LAnet leverages advancements in image processing and deep learning to accurately identify signs of drowsiness and fatigue from images.Our method involves several stages: image loading, pre-processing, feature extraction, and classification. The core of our system, LAnet, is trained on a diverse dataset of facial images with various states of alertness, enabling it to learn and indicate of drowsiness.
22	This study focuses on analyzing cancer-associated mutations in the POLB gene using machine learning and bioinformatics techniques. POLB, crucial for DNA base excision repair, is often mutated in various cancers. We employ an existing One-Class Support Vector Machine (OCSVM) algorithm to identify potential mutations, leveraging its strength in anomaly detection. However, due to OCSVM's limitations in interpretability, we propose using a Decision Tree algorithm. Decision Trees offer clearer insights into the features contributing to mutation classification and potentially improve detection accuracy. Our methodology includes data collection, preprocessing, and model training, followed by a comparative analysis of the OCSVM and Decision Tree models. This research aims to enhance the identification of cancer-related mutations in POLB, providing a more interpretable and effective diagnostic tool.
23	Accurate prediction of the state-of-charge (SOC) of battery energy storage system (BESS) is critical for its safety and lifespan in electric vehicles. To overcome the imbalance of existing methods between multi-scale feature fusion and global feature extraction, this paper introduces a novel multi-scale fusion (MSF) model based on gated recurrent unit (GRU), which is specifically designed for complex multi-step SOC prediction in practical BESSs. Pearson correlation analysis is first em- ployed to identify SOC-related parameters. These parameters are then input into a multi-layer GRU for point-wise feature ex- traction. Concurrently, the parameters undergo patching before entering a dual-stage multi-layer GRU, thus enabling the model to capture nuanced information across varying time intervals. Ultimately, by means of adaptive weight fusion and a fully connected network, multi-step SOC predictions are rendered. Following extensive validation over multiple days, it is illustrated that the proposed model achieves an absolute error of less than 1.5% in real-time SOC prediction.

24	For most spectrum sensing applications, deep learning (DL) yields state-of-the-art performance, but it is susceptible to adversarial cases. In light of this fact, we take into a situation of noncooperative communication in which a hacker attempts to identify the type of modulation used in the intercepted signal. This work specifically attempts to reduce the accuracy of the trespasser while ensuring that the intended recipient may still reliably recover the underlying message. Adversarial perturbations are added to the channel input symbols at the encoder to carry out this operation. While in this work, we enriched the meaning of adversarial examples, and first claimed that the imperceptibility of adversarial examples in the field of image classification is constrained to be invisible to a human observer by minimising the l p Filters are imperceptible to wireless communications. In light of this viewpoint, we refined the adversarial example model and limited the adversarial perturbation to a small frequency range, making it impervious to filtering. In addition, we establish a new set of measures to characterise the hostile wireless signal's imperceptibility. The simulation results show how well our method works to protect wireless communication from cutting-edge DL-based attackers while reducing the loss of communication performance.
25	Anomaly detection (AD) in medical pictures identifies aberrant inputs based on normal training examples. Knowledge distillation (KD) based on the T-S model is a simple and effective method for identifying anomalies. However, its effectiveness is limited by the similarity between teacher and student network architectures (S-Nets). This article proposes a T-S model with skip connections (Skip-TS) trained using direct reverse KD (DRKD) for detecting AD in medical images. To address the issue of low sensitivity to structural similarity, we propose an encoder-decoder architecture with a pre-trained encoder (T-Net) and a randomly initialized decoder (S-Net). In our base paper use different type of dataset for checking the segmentation model here use the Breast cancer dataset for checking our S-net and T-net. First import all the packages and read the images, preprocess all the images by resizing and color conversion and then design the encoder and decoder using the up sampling and down-sampling model. Next step is to fit the model with the train and test image with mask images and then finally get the segmented portion for the selected image.
26	Internet of Things (IoT) devices has increased their vulnerability to Distributed Denial of Service (DDoS) attacks. DDoS attacks have evolved into complex multi-vector threats that highvolume and low-volume attack strategies, posing challenges for detection using traditional methods. These challenges highlight the importance of reliable detection and prevention measures. This paper introduces a novel Deep Ensemble learning with Pruning (DEEPShield) system, to efficiently detect both high- and low-volume DDoS attacks in resource-constrained environments. The DEEPShield system uses ensemble learning by integrating a Convolutional Neural Network (CNN) and a Long Short-Term Memory (LSTM)network with a network traffic analysis system.So for identifying the intrusion we have designed the different machine learning algorithms such as CNN , LSTM , Ensemble CNN and LSTM. The experimental results shows that the accuracy algorithms

27	Biometric recognition is an emerging field leveraging physiological and behavioral characteristics for identification and verification purposes. The BIOWISH system utilizes wearable inertial sensors to capture and analyze heart activity, providing a novel approach to biometric recognition. Specifically, this system employs Random Forest and one-dimensional Convolutional Neural Network (CNN-1D) algorithms to process the collected biometric data. These sophisticated machine learning techniques are adept at handling the nuances of heart activity signals, ensuring accurate recognition outcomes. The system is designed to predict three distinct states: interruption, no stress, and time pressure. By discerning these states, BIOWISH offers valuable insights into an individual's physiological and psychological condition in real-time. This capability is particularly beneficial in environments where continuous monitoring and quick identification are critical, such as in high-stress workplaces, healthcare settings, and security applications.
28	Innovations in machine learning (ML) and deep learning (DL) have enabled network intrusion detection systems (NIDS) to analyse large amounts of data and identify patterns, which has significantly improved anomaly detection. Either flow-based or packet-based characteristics are used in the training of ML/DL-based NIDS. While packet-based NIDS can analyse data and identify attacks in real-time, flow-based NIDS are best suited for offline traffic analysis. Existing packet-based methods ignore the sequential structure of network communication by analysing packets independently. As a result, biased models with more false positives and negatives are produced. Furthermore, the majority of packet-based NIDS that have been suggested in the literature only record payload data, ignoring important information from packet headers. The identification of header-level attacks, such denial-of-service attacks, may be hampered by this omission. To overcome these restrictions we suggest a brand-new methodological framework for packet-based NIDS that takes into account temporal relationships between packets and effectively analyses header and payload data thanks to artificial intelligence. Sequential packets are converted into two-dimensional images using our system. After that, it creates an intrusion detection model using convolutional neural networks to analyse these photos and find suspicious activity. We show that our approach can obtain high detection rates of 97.7% to 99% across various attack types and shows promising robustness against adversarial examples through tests utilizing publically available huge datasets.

29	Although the underwater optical communication system (UWOC) plays an important role in many marine applications, the acquisition, pointing and tracking (APT) problems are still great challenges in a long or turbid water channel. The Orthogonal Frequency Division Multiplexing (OFDM) and the space-time block coding (STBC) technologies have been introduced in UWOC systems to improve spectral efficiency and data transmission reliability. On these foundations, a multi-input multi-output (MIMO) mode is proposed and verified in this article to reduce the alignment requirement. In experiments, two sets of 450 nm blue laser diodes (LDs) and PIN photodiodes are selected as light sources and receivers, and then parallel light beams are generated and modulated using an Alamouti coding for its anti-interference ability. The receiving plane is rotated to simulate the various alignment situations, and the system performance of MIMO-OFDM and single-input single-output OFDM (SISO-OFDM) are compared in tap water and turbid water. The results show that the spatial diversity in MIMO can extend the communication range and its single-sided maximum detection angle range is 92% and 112% higher than the SISO system, respectively.
30	An online auction system developed using Django framework facilitates a dynamic marketplace where administrators, vendors, and bidders interact. The system empowers administrators to manage the platform, overseeing user registrations, moderating auctions, and resolving disputes. Vendors utilize the platform to list products/services for auction, setting starting bids and auction durations. Bidders engage in competitive bidding, placing bids on desired items and monitoring auctions in real-time. With intuitive interfaces and robust security measures, the system provides a seamless experience for all stakeholders, fostering a vibrant and transparent online auction environment. Furthermore, the system incorporates features such as real-time notifications to keep bidders updated on auction statuses and bid activities, enhancing user engagement and ensuring timely participation. Administrators have access to comprehensive analytics and reporting tools to monitor platform performance, track key metrics, and identify trends, enabling informed decision-making and continuous improvement. With customizable settings, the platform accommodates various auction formats and business models, catering to diverse market needs and preferences. Overall, by promoting fair competition, transparency, and efficiency, the Django-based online auction system establishes itself as a reliable and trusted marketplace for buying and selling goods and services.

31	The Smart Traffic Management System using cloud computing aims to enhance urban traffic flow and reduce congestion through advanced image processing and deep learning techniques. The system begins by processing vehicle images from a dataset, performing pre-processing tasks like resizing and grey-scale conversion. Key features are extracted using statistical measures and Local Binary Pattern (LBP). These images are then split into training and testing sets to develop and evaluate a vehicle detection model using YOLO. Traffic density is computed based on vehicle counts per unit length and sent to a cloud server for storage. The server further calculates the optimal green signal time using a Signal Switching Algorithm, designed to optimize traffic flow. The system's performance is quantified through metrics such as accuracy and error rate, and results are presented in comparison graphs and tables.
32	This project delves into the potential of using deep learning to enhance the diagnosis of Autism Spectrum Disorder (ASD). Functional magnetic resonance imaging (fMRI) data shows promise in revealing brain dysfunction in ASD patients. We employ deep learning techniques, specifically Convolutional Neural Networks (CNNs) and transfer learning, to analyze fMRI data from the Autism Brain Imaging Data Exchange (ABIDE) datasets. Our optimized CNN achieves an 81% accuracy in classifying autistic and typically developing brains, exceeding the performance of previous methods. This project provide that deep learning could serve as a valuable tool for ASD diagnosis. We also aim to evaluate the model by calculating its accuracy, precision, and recall for classification purposes.
33	Accurate segmentation of kidney tumors is crucial for diagnosis, treatment planning, and monitoring of kidney tumour. Convolutional neural networks (CNNs) have shown promising results in medical image segmentation tasks. In this study, we propose a CNN-based approach for the segmentation of kidney tumors from abdominal ultrasound images.The proposed method involves a multi-stage CNN architecture that first localizes the kidney region and then segments the tumor within the kidney. The accurate and robust segmentation of kidney tumors can assist clinicians in early detection, treatment planning, and monitoring of kidney cancer, ultimately improving patient outcomes.
34	In the realm of underwater photography, the quest to overcome challenges related to limited visibility and color distortion has spurred innovative research endeavors. This study integrates cutting-edge deep learning methodologies with conventional image processing techniques, particularly emphasizing the efficacy of hybrid networks. The primary workflow involves the enhancement of low-light underwater images through the application of hybrid-CNNs. The process begins with the collection and preprocessing of a comprehensive dataset, including extraction of Red, Blue, and Green channels, resizing, and color correction. Subsequently, the dataset undergoes a split of 80:20 ratio, introducing variability. The pivotal stage employs CNN for classify the classes. Further, YOLO-v8 is applied for object detection, providing parameters for image verification through metrics such as accuracy, loss, confusion matrix, classification report. The study culminates in the evaluation of model performance, elucidated by accuracy and loss metrics, advancing the understanding and application of image enhancement in underwater photography.

35	In the realm of financial forecasting, predicting stock prices is a highly challenging yet crucial task for investors and analysts. The implementation of advanced algorithms such as Lasso regression and Long Short-Term Memory (LSTM) networks can significantly enhance the accuracy of these predictions. This study explores the integration of Value-Weighted Skill Scores in a deep ensemble learning framework, which combines Lasso regression and LSTM models to forecast stock prices. Lasso regression, a linear model that performs both variable selection and regularization, helps in identifying significant predictors while mitigating over fitting. In parallel, LSTM, a type of recurrent neural network adept at capturing temporal dependencies, models the sequential nature of stock price movements.
36	This study introduces a novel approach utilizing Support Vector Machines (SVM) and Convolutional Neural Networks (CNN) for the automated identification of kidney stones from medical images. The proposed system leverages SVM for feature extraction and classification, complemented by CNNs for deep learning-based image analysis. Integrating these algorithms enables robust prediction capabilities, distinguishing between images depicting kidney stones and normal kidney structures. The effectiveness of the approach is validated through rigorous experimentation on a dataset of kidney disease images, demonstrating high accuracy and reliability in diagnostic outcomes. This research contributes to advancing medical imaging technology by providing a feasible and efficient tool for early detection and diagnosis of kidney stones, facilitating timely medical interventions and improved patient outcomes.
37	This study emphasizes the improvement of generalization through a novel composite approach involving the use of a lifecycle-based dataset (characterizing the attack as sequences of techniques), automatic feature learning(auto-learning), and a CNN-based deep learning model. The established model is tested on five public datasets to assess its generalization performance . The Attack is identified using CICIDS 2017 Dataset with using that Accuracy , Precision , Recall and F1-Score metrics . And the efforts have resulted in significant advancements in modelgeneralization, offering a more robust strategy for addressing intrusion detection challenges
38	In image preprocessing, the a facial regionof interest has been segmented from the input image.with using classical deep feature representation and the quantum part that involves successive sets of quantum convolutional layers followed by random quantum variational circuits for feature learning . In this the proposed system has attained a faster training approach using the proposed quantum convolutional neural network approach that takes O(log(n)) time. Facial expression recognition, a crucial aspect of social cognition,is one of the diagnostic abnormalities of schizophrenia.Using facial expression recognition system has been proposed that analyzes static, sequential, or video facial images from medical healthcare data to detect emotions in people's facial regions . The algorithms such as Quantum Convolutional neural network for predicting and recognizing the face emotions.Finally, the experimental results shows that the performance metrics such as accuracy, precision and recall.

39	Due to its strong ?exibility, easy deployment and extensive connectivity, unmanned aerial vehicle (UAV) swarm has been widely used in emergency communication in recent years, especially in the case when terrestrial communication infrastructures are no longer available. Within a UAV swarm, the design of routing protocol is one of the most challenging problems that enables cooperation among multiple UAVs to perform complex tasks in disaster areas. Nevertheless, the routing protocols reported so far have made the simplifying assumption that the UAV nodes move randomly. In the context of mission-oriented scenarios, such as emergency communication in disaster areas, this assumption appears evidently impractical. On the contrary, for many UAV applications, the trajectories of UAVs are pre-planned in advance through mission planning and trajectory planning. Disregarding trajectory information from the application layer may result in routing protocols struggling to adapt to rapid changes in network topology and facing challenges in achieving optimal performance across various communication metrics. To break the bottleneck, in this paper, we propose an effcient trajectory-based optimized routing protocol (TORP) for mission-oriented UAV swarm. Firstly, we model the packet routing problem using the concept of time-dependent graph. The objective is to maximize network performance, considering the power consumption and end-to-end (E2E) delay. The formulated problem is a binary linear programming (BLP) problem which is intractable to solve. Firstly, we propose a modifed dynamically weighted Dijkstra's algorithm (MDWD). Based on the MDWD algorithm, we further propose an effcient optimization scheme to solve the constructed optimization problem. The simulation results demonstrate that our algorithm can make effective routing selections in dynamic UAV network, thereby improving the system performance in terms of packet delivery ratio, end-toend delay and power consumption.
40	The domain name system (DNS) plays a crucial role in network communications, critical industrial systems (CIS), and SCADA networks. DNS over HTTPS (DoH), which encapsulates DNS within HTTPS, does not prevent network exploitation. This research offers a hybrid deep learning approach to classify encoded network traffic as DoH or NonDoH. These can be malevolent, innocuous, or zero-day attacks. The suggested technique uses CNN for fast information extraction and LSTM for learning long-term dependencies. DOH and NonDoH classifies traffic as benign, zero-day, or malicious. The proposed hybrid deep learning model achieved 99.28% accuracy and precision, 99.75% recall, and an AUC of 0.9975 with low training and testing time of 745s and 0.000324s, respectively. The suggested technique outperforms current algorithms and techniques, and detects all sorts of attacks. The study also examined the effectiveness of the SMOTE approach for data balance. The suggested scheme's reliability was validated by evaluating an industrial control system SCADA (ICS-SCADA) dataset and two other cyber-security datasets (NSL-KDD and CICDS2017). The suggested model's performance was validated using the Mathews correlation coefficient (MCC), verifying its applicability
41	Interleaved training is a promising technique for reducing training overhead in massive MIMO systems. This project investigates the influence of channel correlation on interleaved training for single-user massive MIMO downlink. We propose modified beam-domain and antenna-domain interleaved training schemes to optimize training efficiency in correlated channel environments. Analytical expressions for average training length are derived and verified through simulations, providing insights into system performance. Results demonstrate that the proposed schemes significantly reduce training overhead compared to conventional methods.

Recent advances in deep learning have greatly facilitated the automated segmentation of ultrasound images, which is essential for nodule morphological analysis. Nevertheless, most existing methods depend on extensive and precise annotations by domain experts, which are labor-intensive and time-consuming. In this study, we suggest using simple aspect ratio annotations directly from ultrasound clinical diagnoses for automated nodule segmentation. Especially, an asymmetric learning framework is developed by extending the aspect ratio annotations with two types of pseudo labels, i.e., conservative labels and radical labels, to train two asymmetric segmentation networks simultaneously. Subsequently, a conservative-radicalbalance strategy (CRBS) strategy is proposed to complementally combine radical and conservative labels. An inconsistency-aware dynamically mixed pseudo-labels supervision (IDMPS) module is introduced to address the challenges of over-segmentation and under-segmentation caused by the two types of labels. To further leverage the spatial prior knowledge provided by clinical annotations, we also present a novel loss function namely the clinical anatomy prior loss. Extensive experiments on two clinically collected ultrasound datasets (thyroid and breast) demonstrate the superior performance of our proposed method, which can achieve comparable and even better performance than fully supervised methods using ground truth annotations

43	In recent years, the integration of artificial intelligence (AI) into English as a Foreign Language (EFL) learning and teaching has garnered significant attention due to its potential to address various learning difficulties encountered by students. This study aims to classify these difficulties based on their level of comprehension impact, categorizing them as easy to understand, slightly challenging, or confusing. Employing machine learning algorithms such as Random Forest and a hybrid approach combining Logistic Regression and decision tree, the research explores how AI applications can effectively identify and mitigate these challenges. By analyzing a diverse range of data sources including student performance metrics, language proficiency assessments, and feedback from educators, the study provides insights into the nuanced nature of learning obstacles in EFL contexts.
44	Dark image enhancement aims at converting dark images to normal-light images. Existing dark image enhancement methods take uncompressed dark images as inputs and achieve great performance. However, in practice, dark images are often compressed before storage or transmission over the Internet. Current methods get poor performance when processing compressed dark images. Artifacts hidden in the dark regions are amplifed by current methods, which results in uncomfortable visual effects for observers. Based on this observation, this study aims at enhancing compressed dark images while avoiding compression artifacts amplifcation. Since texture details intertwine with compression artifacts in compressed dark images, detail enhancement and blocking artifacts suppression contradict each other in image space. Therefore, we handle the task in latent space. To this end, we propose a novel latent mapping network based on variational auto-encoder (VAE). Firstly, different from previous VAE-based methods with single-resolution features only, we exploit multiple latent spaces with multi-resolution features, to reduce the detail

	blur and improve image fdelity. Specifcally, we train two multilevel VAEs to project compressed dark images and normal-light images into their latent spaces respectively. Secondly, we leverage a latent mapping network to transform features from compressed dark space to normal-light space. Specifcally, since the degradation models of darkness and compression are different from each other, the latent mapping process is divided mapping into enlightening branch and deblocking branch. Comprehensive experiments demonstrate that the proposed method achieves stateof-the-art performance in compressed dark image enhancement.
45	In the realm of machine learning (ML) education, fostering practical skills and competitive spirit among students is crucial. This study explores the application of competition-based learning to enhance students' practical and competitive AI abilities within a machine learning curriculum. The research focuses on employing two distinct algorithms, namely random forest regression and lasso regression, to predict students' practical AI proficiency measured by their GPA. By leveraging these algorithms, the study aims to provide insights into how different ML techniques can be utilized to assess and improve students' understanding and application of AI concepts in real-world scenarios. The findings are expected to contribute to the development of effective educational strategies that not only evaluate academic performance but also cultivate a robust practical AI skill set essential for future professionals in the field.

46	Artificial Intelligence (AI) and Machine Learning (ML) have emerged as transformative tools in enhancing glycemic control for individuals with diabetes. This study focuses on predicting diabetes onset using ML techniques, specifically Random Forest and Logistic Regression, with feature extraction facilitated by Principal Component Analysis (PCA). The objective is to leverage these algorithms to accurately identify early indicators and patterns associated with diabetes, aiding in proactive management and prevention strategies. By exploring these methodologies, this research aims to advance the application of AI and ML in diabetes care, highlighting effective strategies while addressing challenges to foster improved glycemic control outcomes. Opportunities lie in the potential for AI to improve adherence to treatment regimens, enhance patient outcomes through real-time feedback, and facilitate personalized medicine approaches.
47	Spiking neural networks (SNNs) are particularly appealing for edge intelligence applications where resources are scarce because of their exceptionally low power consumption. This work studies an energy-efficient (EE) distributed SNN in which input is gathered and processed via wireless channels by a number of edge nodes, each of which has a subset of spiking neurons. We define the problem of minimising the energy consumption of edge devices under limited bandwidth and spike loss probability limitations and construct quantitative system models to take advantage of the advantages of the joint design of neuromorphic computing and wireless communications. In particular, a simplified homogeneous SNN is investigated initially, and it is shown that the system has stationary states with a constant firing rate. An approach based on alternating optimisation is then suggested for sharing the computational and communication resources. By using the spike statistics, the techniques are further extended to heterogeneous SNNs. Comprehensive simulation outcomes on neuromorphic datasets show that the suggested algorithms may guarantee accurate inference while substantially lowering the power consumption of edge systems.
48	Detection of cyber-attacks in smart power distribution grids with unbalanced configurations poses challenges due to the inherent nonlinear nature of these uncertain and stochastic systems. To address these challenges, this paper proposes an unsupervised adversarial autoencoder (AAE) model to detect FDIAs in unbalanced power distribution grids integrated with DERs, i.e., PV systems and wind generation. The advantage of the proposed data-driven model is that it can detect anomalous points for the system operation without reliance on abstract models or mathematical representations. To evaluate the efficacy of the approach, it is tested on IEEE 13-bus and 123-bus systems with historical meteorological data (wind speed, ambient temperature, and solar irradiance) as well as historical real-world load data under three types of data falsification functions. The comparison of the detection results of the proposed model with other unsupervised learning methods verifies its superior performance in detecting cyber-attacks in unbalanced power distribution grids.

49	Machine learning techniques have garnered interest insecurity applications due to their rapid processing capabilities and real-time predictions. However, imbalanced data distributionis a prevalent issue in IIoT environments, adversely affecting MLbased attack detection systems. In this work, we present a novelgameticheredity-based oversampling technique for addressingimbalanced data challenges in cybersecurity applications, specifically targeting IIoT systems. The proposed model enhancesdiversityin the minority classes by generating unique syntheticminority samples, creating diverse synthetic data while restricting instances to the minority class region. The proposed modeloutperforms complex and conventional methods in terms ofprecision, recall & F-Score while mitigating over-generalizationby evenly distributing newly generated samples within minorityclass boundaries and regions. To validate the proposed model andverify its efficacy in identifying cyber threats, we used the UNSWNB15 dataset. Simulation results demonstrate that the proposedmodel efficiently detects attacks with high performance comparedto state-of-the-art techniques. Our research contributes to developing robust & efficient machine learning models for enhancing the security of IIoT systems while handling class imbalanceissues.
50	In today's fast-paced world, the complexity of human emotions often leaves individuals feeling like a ship navigating turbulent waters. Enter the realm of Artificial Intelligence (AI), a beacon of hope able to forecast, analyse, and even alleviate the tempest of mood swings. Imagine a digital companion equipped with algorithms and deep learning techniques that continuously learns from daily interactions and biometric data, discern patterns in emotional shifts with surgical precision. This AI friend captures the nuances of mood, identifying triggers that impact your emotional landscape—whether it be social media interactions, sleep patterns, or seasonal changes. The power of Natural Language Processing (NLP) propels AI systems to analyze the sentiments of your spoken or written words. By sifting through your texts or conversations, it identifies tonal variations and words linked to happiness, sadness, anger, or anxiety. Over time, this creates a comprehensive emotional portfolio, illuminating with alarming clarity when those evocative swings arise. Combine this with data from wearables, and you have a revolution in mood analysis. Heart rate variability, sleep quality, and even physical activity levels become threads in a vast tapestry depicting emotional health. The AI engine detects when your heart races in excitement or sinks during stress, correlating physiological changes with emotional states.

51	Automatic retinal layer segmentation with medical images, such as optical coherence tomography (OCT) images, serves as an important tool for diagnosing ophthalmic diseases. However, it is challenging to achieve accurate segmentation due to low contrast and blood flow noises presented in the images. In addition, the algorithm should be light-weight to be deployed for practical clinical applications. Therefore, it is desired to design a light-weight network with high performance for retinal layer segmentation. In this paper, we propose LightReSeg for retinal layer segmentation which can be applied to OCT images. Specifically, our approach follows an encoder-decoder structure, where the encoder part employs multi-scale feature extraction and a Transformer block for fully exploiting the semantic information of feature maps at all scales and making the features have better global reasoning capabilities, while the decoder part, we design a multi-scale asymmetric attention (MAA) module for preserving the semantic information at each encoder scale. The experiments show that our approach achieves a better segmentation performance compared to the current state-of-theart method TransUnet with 105.7M parameters on both our collected dataset and two other public datasets, with only 3.3M parameters.
52	A problem with machine learning (ML) techniques for detecting intrusions in the Internet of Things (IoT) is that they are ineffective in the detection of low frequency intrusions. In addition, as ML models are trained using specific attack categories, they cannot recognize unknown attacks. This article integrates strategies of cost sensitive learning and multitask learning into a hybrid ML model to address these two challenges. The hybrid model consists of an autoencoder for feature extraction and a support vector machine (SVM) for detecting intrusions. In the cost-sensitive learning phase for the class imbalance problem, the hinge loss layer is enhanced to make a classifier strong against low-distributed intrusions. Moreover, to detect unknown attacks, we formulate the SVM as a multitask problem. Experiments on the UNSW-NB15 and BoT-IoT datasets demonstrate the superiority of our model in terms of recall, precision, and F1-score averagely 92.2%, 96.2%, and 94.3%, respectively, over other approaches.
53	In this study, we explore the application of deep omni-supervised learning techniques for the detection of rib fractures from chest radiology images. The primary objective is to accurately identify regions of rib fractures and predict their affected status using deep neural networks such as ResNet or MobileNet. Chest radiology plays a critical role in diagnosing rib fractures, but the process can be challenging due to variations in image quality, patient anatomy, and fracture characteristics. By leveraging deep omni-supervised learning, which combines labeled, unlabeled, and weakly labeled data, we aim to enhance the robustness and accuracy of fracture detection. The proposed approach harnesses the hierarchical features learned by models like ResNet or MobileNet, enabling effective localization and classification of rib fractures. =

54	The proliferation of IoT devices in smart cities and various societal applications is accompanied by growing concerns about cyberattacks on cyber-physical systems (CPS). Traditional security measures often prove inadequate in this context. This paper proposes a novel approach to address this challenge by leveraging deep learning (DL) for automatic anomaly detection. A hybrid classifier combining BiLSTM and Convolutional Neural Network (CNN) is employed to distinguish between normal and attack behaviors in IoT-enabled CPS. To enhance the classifier's accuracy, a new hybrid optimization algorithm, Seagull Adapted Elephant Herding Optimization (SAEHO), is introduced to fine-tune the model's weights. Experimental results on datasets demonstrate the superior performance of the proposed "Hybrid Classifier + SAEHO" framework compared to conventional methods in terms of sensitivity, precision, accuracy, and specificity.
55	Air pollution is a severe environmental problem in urban areas. Accurate air quality prediction can help governments and individuals make proper decisions to cope with potential air pollution. As a classic time series forecasting model, the AutoRegressive Integrated Moving Average (ARIMA) has been widely adopted in air quality prediction. However, because of the volatility of air quality and the lack of additional context information, i.e., the spatial relationships among monitor stations, traditional ARIMA models suffer from unstable prediction performance. Though some deep networks can achieve higher accuracy, a mass of training data, heavy computing, and time cost are required. In this paper, we propose a hybrid model to simultaneously predict seven air pollution indicators from multiple monitoring stations. The proposed model consists of three components: (1) an extended ARIMA to predict matrix series of multiple air quality indicators from several adjacent monitoring stations; (2) the Empirical Mode Decomposition (EMD) to decompose the air quality time series data into multiple smooth sub-series; and (3) the truncated Singular Value Decomposition (SVD) to compress and denoise the expanded matrix. Experimental results on the public dataset show that our proposed model outperforms the state-of-art air quality forecasting models in both accuracy and time cost.

56	In recent years, the application of machine learning in the field of traffic management has gained significant attention, particularly for automatic accident detection, segmentation, and duration prediction. This study explores a comprehensive approach that leverages advanced machine learning algorithms to enhance road safety and traffic flow efficiency. The proposed system integrates multiple stages: accident detection, precise segmentation of accident scenes, and accurate prediction of accident duration. Using real-time traffic data and sensor inputs, the system employs deep learning models to identify anomalies and potential accidents. Techniques such as convolutional neural networks (CNNs) and recurrent neural networks (RNNs) are utilized to process and analyze vast amounts of data, ensuring prompt and reliable detection. Once an accident is detected, the system performs segmentation to isolate and identify the specific regions of interest within the scene. This involves using advanced image processing techniques and neural networks to delineate the affected areas, which aids in efficient resource allocation and emergency response. The final stage involves predicting the duration of the accident and its impact on traffic. Machine learning models are trained on historical data, considering various factors such as accident severity, time of day, and weather conditions. This prediction capability is crucial for traffic management centers to devise optimal rerouting strategies and minimize congestion.
57	In the rapidly evolving landscape of Internet of Things (IoT) environments, securing face recognition systems against unauthorized access is paramount. This paper proposes enhanced biometric template protection schemes aimed at ensuring the integrity and privacy of facial recognition data. The objective is to develop a robust system capable of accurately determining whether a detected face is authorized. This is achieved through the utilization of machine learning techniques such as Support Vector Machines (SVM) and deep learning methods including Convolutional Neural Networks (CNN) tailored for 2D facial analysis. Once the face's authorization status is determined, the system extracts pertinent biometric information, encrypts it using RSA encryption, and securely stores it in the cloud. The proposed algorithm ensures that only authorized entities possess the capability to decrypt and access the stored data, thereby safeguarding sensitive information from unauthorized disclosure.
58	Enhancing underwater images poses significant challenges due to issues like poor white balance, low contrast, and non-uniform illumination. By incorporating advanced techniques such as white balance correction, contrast adjustment, and histogram equalization, DiffWater effectively improves the visual quality of underwater images. The core of this enhancement process is driven by a combination of Convolutional Neural Networks (CNNs) and Long Short-Term Memory (LSTM) networks. The CNNs are employed to capture and refine the spatial features of the image, while the LSTMs handle the temporal dependencies to model the intricate variations in underwater scenes. This hybrid algorithm not only corrects color distortions and enhances contrast but also normalizes the image histogram, providing a clearer and more accurate representation of underwater environments.

59	The study addresses the challenge of enhancing the performance of Steady-State Visual Evoked Potential (SSVEP) Brain-Computer Interfaces (BCIs) under fatigue conditions by employing a dynamic stopping strategy combined with a stacked ensemble learning approach. The proposed algorithm integrates Gradient Boosting, Logistic Regression, and Random Forest classifiers within a stacking framework to improve classification accuracy and robustness in distinguishing between fatigue and normal states. Feature extraction is performed using Fast Fourier Transform (FFT), which effectively captures the frequency components of EEG signals related to SSVEP responses. By applying the dynamic stopping strategy, the algorithm adaptively adjusts the stopping criteria during the training process to mitigate the impact of fatigue on classification performance. The combined use of advanced ensemble techniques and adaptive strategies aims to enhance the reliability and accuracy.
60	Epileptic seizures, characterized by abnormal electrical activity in the brain, present a significant challenge for timely and accurate diagnosis. Early and precise detection of seizures is crucial for effective treatment and improving the quality of life for individuals with epilepsy. This study proposes an advanced framework for epileptic seizure detection by integrating path signature analysis with a bidirectional Long Short-Term Memory (Bi-LSTM) network and a Random Forest classifier. The proposed method leverages the strengths of these techniques to enhance detection accuracy and reliability. The combination of Bi-LSTM with attention and Random Forest offers a powerful and interpretable model for seizure detection.
61	Sleep stage classification is pivotal in understanding sleep disorders and improving overall sleep quality. Traditional approaches to sleep stage classification often rely on single-modal data and conventional machine learning techniques, which may not fully capture the intricate patterns and features across different stages of sleep. This study proposes a novel multi-modal sleep stage classification framework utilizing Multi-Scale Masked Autoencoders (MSMAE) and Convolutional Neural Networks (CNNs) to enhance the accuracy and robustness of sleep stage predictions. The system integrates multi-modal data sources, specifically EEG, EOG, and EMG signals, to leverage complementary information and improve classification performance. The framework employs a two-stream encoder-decoder architecture designed to process and fuse these diverse data modalities effectively.

62	In this work, we investigate the joint visibility region (VR) detection and channel estimation (CE) problem for extremely large-scale multiple-input-multiple-output (XL-MIMO) systems considering both the spherical wavefront effect and spatial non-stationary (SnS) property. Unlike existing SnS CE methods that rely on the statistical characteristics of channels in the spatial or delay domain, we propose an approach that simultaneously exploits the antenna-domain spatial correlation and the wavenumber-domain sparsity of SnS channels. To this end, we introduce a two-stage VR detection and CE scheme. In the frst stage, the belief regarding the visibility of antennas is obtained through a VR detection-oriented message passing (VRDOMP) scheme, which fully exploits the spatial correlation among adjacent antenna elements. In the second stage, leveraging the VR information and wavenumber-domain sparsity, we accurately estimate the SnS channel employing the belief-based orthogonal matching pursuit (BB-OMP) method. Simulations show that the proposed algorithms lead to a signifcant enhancement in VR detection and CE accuracy as compared to existing methods, especially in low signal-to-noise ratio (SNR) scenarios.
63	In today's fast-paced financial markets, the integration of Artificial Intelligence (AI) into stock price management systems has become increasingly pivotal. This AI-assisted stock price management system leverages advanced machine learning algorithms and predictive analytics to forecast market trends, optimize trading strategies, and enhance decision-making processes. By analysing vast amounts of historical and real-time data, the system provides actionable insights that help investors and traders navigate market volatility with greater precision and confidence. Its ability to adapt to changing market conditions and identify emerging patterns offers a significant advantage over traditional methods. The system employs sophisticated techniques such as natural language processing, neural networks, and sentiment analysis to refine its predictions and recommendations. These technologies enable the system to assess not only numerical data but also qualitative factors such as news sentiment and geopolitical events. As a result, users benefit from a more holistic view of market dynamics, allowing for more informed investment decisions and efficient portfolio management. Ultimately, this AI-assisted approach aims to maximize returns, minimize risks, and support strategic financial planning in an increasingly complex and competitive environment.
64	A pretrained quantum inspired deep neural network is proposed in this work, whichis constructed based on quantum theory for carrying out strongperformance and great interpretability in related NLP fields.Concretely, a quantum-inspired pretrained feature embedding(QPFE) method is first developed to model superposition statesfor words to embed more textual features. Then, a QPFE-ERNIEmodel isdesigned by merging the semantic features learned fromthe prevalent pretrained model ERNIE, which is verified with twoNLP downstream tasks: 1) sentiment classificationandwordsensedisambiguation(WSD). In addition, schematic quantumcircuit diagrams are provided, which has potential impetus forthe future realization of quantum NLP with quantum device. Finally, the experiment results demonstrate QPFE-ERNIE is significantly better for sentiment classification than gated recurrentunit (GRU), BiLSTM, and TextCNN on Using Sentiment Analysis Dataset in all metricsand achieves better results than ERNIE in accuracy, F1-score,and precision is calculated .

65	This project simulates a MIMO-OFDM communication system leveraging 16-QAM modulation to assess its performance and robustness under various conditions. The system includes random binary data generation, convolutional encoding for error correction, and modulation, followed by transmission through a MIMO channel with cyclic prefix to handle inter-symbol interference. At the receiver, the system uses FFT for signal processing, performs channel estimation and equalization, and decodes the transmitted data. The performance is evaluated through key metrics including Bit Error Rate (BER), Signal-to-Noise Ratio (SNR), Packet Error Rate (PER), throughput, Mean Squared Error (MSE), Root Mean Squared Error (RMSE), and Mean Absolute Error (MAE). The analysis provides a comprehensive view of the system's efficiency, reliability, and error characteristics, offering valuable insights into optimizing communication performance in practical scenarios. Additionally, the impact of various optimization algorithms on system performance is explored, highlighting their effects on BER and SNR, which are crucial for enhancing overall communication quality and system robustness. The results aim to inform future developments and improvements in MIMO-OFDM systems for real-world applications.
66	This project is centered on developing a sophisticated admin-focused ID card management system utilizing Django. The system is designed to streamline and optimize the administration of employee identification, offering several key enhancements: Admin Interface: Provides a powerful and intuitive platform for comprehensive management of employee records. Features include the ability to add, update, and delete employee details seamlessly. Admins can also upload high-resolution photos and generate professional-quality ID cards for each employee.ID Card Generation: Facilitates automated and efficient creation of ID cards in both PDF and image formats. The system includes customizable templates, allowing for tailored designs to meet specific organizational requirements and branding guidelines. Efficient Management: Implements streamlined workflows that significantly reduce manual effort, ensuring a smoother and faster process for managing employee data and producing ID cards. This automation enhances operational efficiency and accuracy. Enhanced Control and Security: Utilizes Django’s robust security features to ensure safe and controlled access to sensitive employee information and ID card generation processes. By leveraging Django's advanced capabilities, this project aims to improve the efficiency, accuracy, and security of ID card management, providing organizations with a streamlined and effective administrative solution.

67	The effciency of the broadcast network is impacted by the different types of services that may be transmitted over it. Global services serve users across the entire network, while local services cater to specifc regions, and hyper-local services have even narrower coverage. Multimedia Broadcast over a Single-Frequency Network (MBSFN) is typically used for global service transmission while existing literature extensively discusses schemes for transmitting local or hyper-local services with or without Single Frequency Network (SFN) gain. However, these schemes fall short when network-wide requests for only local and hyper-local services are made, leading operators to scale down to either Single Cell-Point to Multipoint (SCPtM) or Multi-Frequency Network (MFN). SCPtM is highly susceptible to interference, and MFN requires substantial amounts of valuable spectrum. They both employ the Least Channel Gain (LCG) strategy for transmitting hyper-local services without SFN gain. Our proposed Local and Hyper-Local Services (LHS) transmission scheme utilizes the knowledge of user distribution and their corresponding radio link channel quality to schedule single or multi-resolution, local or hyper-local services within a threecell cluster and aims to enhance spectral effciency and maximize system throughput. It leverages Scalable Video Coding (SVC) in conjunction with Hierarchical Modulation (HM) for transmitting multi-resolution multimedia content to address the problem of heterogeneity amongst the multicast group users. The proposed

	scheme also employs macro-diversity combining with optimal HM parameters for each gNB catering to a local service area in order to minimize the service outage. System-level simulation results testify to the better performance achieved by the proposed LHS transmission scheme with respect to SCPtM.

68	Ensuring data privacy and protection has become paramount in the era of deep learning. Unlearnable examples are proposed to mislead the deep learning models and prevent data from unauthorized exploration by adding small perturbations to data. However, such perturbations (e.g., noise, texture, color change) predominantly impact low-level features, making them vulnerable to common countermeasures. In contrast, semantic images with intricate shapes have a wealth of high-level features, making them more resilient to countermeasures and potential for producing robust unlearnable examples. In this paper, we propose a Deep Hiding (DH) scheme that adaptively hides semantic images enriched with high-level features. We employ an Invertible Neural Network (INN) to invisibly integrate predefined images, inherently hiding them with deceptive perturbations. To enhance data unlearnability, we introduce a Latent Feature Concentration module, designed to work with the INN, regularizing the intra-class variance of these perturbations. To further boost the robustness of unlearnable examples, we design a Semantic Images Generation module that produces hidden semantic images. By utilizing similar semantic information, this module generates similar semantic images for samples within the same classes, thereby enlarging the inter-class distance and narrowing the intra-class distance. Extensive experiments on CIFAR-10, CIFAR-100, and an ImageNet subset, against 18 countermeasures, reveal that our proposed method exhibits outstanding robustness for unlearnable examples, demonstrating its efficacy in preventing unauthorized data exploitation.
69	Industry 5.0 is a emerging transformative model that aims to develop a hyperconnected, automated, and data-driven industrial ecosystem. This digital transformation will boost productivity and efficiency throughout the production process but will be more prone to new sophisticated cyber-attacks. Deep learning-based Intrusion Detection Systems (IDS) have the potential to recognize intrusions with high accuracy. However, these models are complex and are treated as a black box by developers and security analysts due to the inability to interpret the decisions made by these models. Motivated by the challenges, this paper presents an explainable and resilient IDS for Industry 5.0. The proposed IDS is designed by combining bidirectional long short-term memory networks (BiLSTM), a bidirectional-gated recurrent unit (Bi-GRU), fully connected layers and a softmax classifier to enhance the intrusion detection process in Industry 5.0. We employ the SHapley Additive exPlanations (SHAP) mechanism to interpret and understand the features that contributed the most in the decision of the proposed cyber-resilient IDS. The evaluation of the proposed model using the explainability can ensure that the model is working as expected. The experimental results based on the CICDDoS2019 dataset confirms the superiority of the proposed IDS over some recent approaches.
70	Step into Success: A Student Performance Analysis for Future Scope using Python Flask is a sophisticated web application designed to evaluate and project student performance to inform educational strategies and future planning. The application utilizes Python's robust data analysis and machine learning libraries, such as Pandas, Scikit-learn, and TensorFlow, to process and analyze historical student performance data, including grades, attendance, and extracurricular activities. The Flask framework powers the backend, managing data processing, model training, and predictive analytics. The system analyzes trends and patterns in student performance, offering insights into areas of strength and opportunities for improvement. It generates detailed reports and visualizations to help educators and administrators identify potential academic and developmental needs, and predict future performance trajectories. By leveraging these insights, the application supports the creation of tailored educational plans and interventions, enhancing the overall effectiveness of academic programs and helping students achieve their full potential.

71	In recent years, there has been a surge in interest regarding the intricate physiological interplay between the brain and the heart, particularly during emotional processing. This has led to the development of various signal processing techniques aimed at investigating Brain-Heart Interactions (BHI), reflecting a growing appreciation for their bidirectional communication and influence on each other. Our study contributes to this burgeoning field by adopting a network physiology approach, employing time-delay stability as a quantifiable metric to discern and measure the coupling strength between the brain and the heart, specifically during visual emotional elicitation. We extract and transform features from EEG and ECG signals into a 1 Hz format, facilitating the calculation of BHI coupling strength through stability analysis on their maximal cross-correlation. Notably, our investigation sheds light on the critical role played by low-frequency components in EEG, particularly in the d , ? , and a bands, as essential mediators of information transmission during the complex processing of emotion-related stimuli by the brain. Furthermore, our analysis highlights the pivotal involvement of frontal pole regions, emphasizing the significance of d - ? coupling in mediating emotional responses. Additionally, we observe significant arousal-dependent changes in the ? frequency band across different emotional states, particularly evident in the prefrontal cortex. By offering novel insights into the synchronized dynamics of cortical and heartbeat activities during emotional elicitation, our research enriches the expanding knowledge base in the field of neurophysiology and emotion research.
72	E-Learning Platform using Django and Python is a comprehensive web application designed to facilitate online education and provide a robust learning environment for students and educators. Built on Django’s powerful framework, the platform offers a wide range of features to support interactive learning, course management, and student engagement. The application enables educators to create and manage courses, upload learning materials, and design interactive assignments and quizzes. Students can access course content, participate in discussions, and track their progress through a user-friendly interface. Django’s backend handles user authentication, data management, and real-time updates, ensuring a seamless learning experience. The platform also incorporates features such as multimedia support, progress tracking, and personalized feedback, enhancing the educational experience. By utilizing Python’s libraries for data processing and Django’s secure and scalable architecture, the E-Learning Platform delivers a reliable and engaging online learning environment that supports diverse educational needs and fosters effective knowledge sharing.
73	Spam Email Detector Using Artificial Intelligence with Python is an advanced system designed to efficiently identify and filter out unwanted spam emails. Utilizing Python's robust libraries such as Scikit-learn, TensorFlow, and NLTK, this application employs sophisticated machine learning algorithms and natural language processing techniques to analyze and classify email content. By training on extensive datasets of labeled emails, the AI models, including supervised learning algorithms like logistic regression and deep learning methods, learn to detect patterns and features indicative of spam. The system continuously updates its models with new data to enhance detection accuracy and adapt to evolving spam tactics. Featuring real-time email scanning and classification, the Spam Email Detector ensures users' inboxes remain secure and free from unwanted messages, effectively reducing the risk of phishing attacks and improving overall email management.

74	Sentiment Analysis of Social Media Using Artificial Intelligence with Python is a powerful application designed to analyze and interpret emotions expressed in social media posts. Utilizing Python's advanced libraries such as NLTK, TextBlob, and Transformers, the system leverages artificial intelligence and natural language processing techniques to assess the sentiment behind user-generated content across platforms like Twitter, Facebook, and Instagram. The AI models employed in this application are trained to recognize and classify sentiments into categories such as positive, negative, or neutral. By processing large volumes of social media data, the system identifies trends and patterns in public opinion, enabling businesses and organizations to gauge customer feedback, monitor brand reputation, and track emerging topics. Advanced techniques such as deep learning and sentiment lexicons are used to improve accuracy and handle nuanced expressions of sentiment. With features for real-time analysis and visualizations, the Sentiment Analysis tool provides actionable insights into public sentiment, helping users make informed decisions and respond effectively to social media trends. By combining Python's data science capabilities with AI-driven sentiment analysis, the tool offers a comprehensive solution for understanding and leveraging social media dynamics.
75	This project focuses on developing a digit recognition system using artificial intelligence (AI) to accurately identify and classify handwritten digits from 0 to 9. By leveraging machine learning techniques, particularly convolutional neural networks (CNNs), the system is trained on a large dataset of labeled digit images, such as the MNIST dataset. The AI model learns to extract features and patterns from the images, enabling it to distinguish between different digits with high accuracy. The project involves data preprocessing, model architecture design, training, and evaluation phases. By automating the digit recognition process, this project aims to enhance data entry efficiency, reduce manual errors, and facilitate the development of smart applications that require accurate digit interpretation. The integration of such a system can significantly improve workflows in sectors like finance, logistics, and education, where handwritten data processing is crucial. Additionally, the project explores optimization techniques to improve the model's performance and generalization capabilities, ensuring robustness in diverse real-world scenarios. Future enhancements may include expanding the model to recognize a broader range of symbols or integrating it with other AI technologies to create more comprehensive automated systems.
76	Many social media users express concerns about vaccines and their side effects on Twitter. These concerns lead to a compromise of confidence which brings about vaccine hesitancy. In Africa, vaccine hesitancy is a major challenge faced by health policymakers in the fight against COVID-19. Given that most tweets are geotagged, clustering them according to their sentiments could help identify locations that may likely experience vaccine hesitancy for health policy and planning. In this study, we collected 70000 geotagged vaccine-related tweets in nine African countries, from December 2020 to February 2022. The tweets were classified into three sentiment classes—positive, negative, and neutral. The quality of the classification outputs was achieved using Naíve Bayes (NB), logistic regression (LR), support vector machines (SVMs), decision tree (DT), and K-nearest neighbor (KNN) machine learning classifiers. The LR achieved the highest accuracy of 71% with an average area under the curve of 85%. The point-based location technique was used to calculate the hotspots based on the locations of the classified tweets. Locations with green, red, and gray backgrounds on the map signify a hotspot for positive, negative, and neutral sentiments. The outcome of this research shows that discussions on social media can be analyzed to identify hotspots during a disease outbreak, which could inform health policy in planning and management of vaccine hesitancy in Africa.

77	Price Negotiator Ecommerce ChatBot System using Streamlit is an innovative web application designed to enhance the online shopping experience by automating price negotiation processes. Built with Streamlit, the system provides a user-friendly interface where shoppers can interact with an AI-powered chatbot to negotiate prices on various products. The chatbot, integrated into the Streamlit app, leverages natural language processing (NLP) and machine learning algorithms to understand and respond to user queries about product pricing. It can handle multiple negotiation scenarios, offering real-time price adjustments and personalized discount suggestions based on user input and predefined rules. Streamlit's intuitive interface allows for seamless integration of the chatbot into the ecommerce platform, providing an interactive and engaging experience for users.The system also includes features for tracking negotiation history, analyzing user preferences, and providing insights into price trends. By automating the negotiation process, the Price Negotiator ChatBot System helps streamline transactions, improve customer satisfaction, and drive sales conversions, making it a valuable tool for both ecommerce businesses and consumers.
78	The Internet of Things (IoT) is being prominently used in smart cities and a wide range of applications in society. The benefits of IoT are evident, but cyber terrorism and security concerns inhibit many organizations and users from deploying it. Cyber-physical systems that are IoT-enabled might be difficult to secure since security solutions designed for general information/operational technology systems may not work as well in an environment. Thus, deep learning (DL) can assist as a powerful tool for building IoT-enabled cyber-physical systems with automatic anomaly detection. In this paper, two distinct DL models have been employed i.e., Deep Belief Network (DBN) and Convolutional Neural Network (CNN), considered hybrid classifiers, to create a framework for detecting attacks in IoT-enabled cyber-physical systems. However, DL models need to be trained in such a way that will increase their classification accuracy. Therefore, this paper also aims to present a new hybrid optimization algorithm called "Seagull Adapted Elephant Herding Optimization" (SAEHO) to tune the weights of the hybrid classifier. The "Hybrid Classifier + SAEHO" framework takes the feature extracted dataset as an input and classifies the network as either attack or benign. Using sensitivity, precision, accuracy, and specificity, two datasets were compared. In every performance metric, the proposed framework outperforms conventional methods.

79	Intelligent Transportation Systems (ITS) supported by smart vehicles have revolutionized modern transportation, offering a wide range of applications and services, such as electronic toll collection, collision avoidance alarms, real-time parking management, and traffic planning. However, the open communication channels among various entities, including smart vehicles, roadside infrastructure, and fleet management systems, introduce security and privacy vulnerabilities. To address these concerns, we propose a novel security framework, named blockchain-assisted lightweight authenticated key agreement security framework for smart vehicles-enabled ITS (BASF-ITS), which ensures data protection both during transit and while stored on cloud servers. BASF-ITS employs a combination of efficient cryptographic primitives, including hash functions, XOR operator, ASCON, elliptic curve cryptography, and physical unclonable functions (PUF), to design authenticated key agreement schemes. The inclusion of PUF significantly enhances the system's resistance to physical attacks, preventing tampering attempts. To ensure data integrity when stored on the cloud, our framework incorporates blockchain technology. By leveraging the immutability and decentralization of the blockchain, BASF-ITS effectively safeguards data at rest, providing an additional layer of security. We rigorously analyze the security of BASF-ITS and demonstrate its strong resistance against potential security ass aults, making it a robust and reliable solution for smart vehicle-enabled ITS. In a comparative analysis with contemporary competing schemes, BASF-ITS emerges as a promising approach, offering superior functionality traits, enhanced security features, and reduced computation, communication, and storage costs. Furthermore, we present a practical implementation of BASF-ITS using blockchain technology, showcasing the computational time versus the "transactions per block" and the "number of mined blocks
80	With the rise of smart working and recent global events, the risk of cyberattacks is increasing steadily. Sometimes adversaries focus on stealing valuable data, such as intellectual property (IP): they exfiltrate a large volume of IP documents from a target company. They then identify those of their interest by leveraging automated methods. This work proposes the DARD (Deceptive Approaches for Robust Defense against IP theft) system, a framework designed to deceive adversaries who rely on automatic approaches to classify exfiltrated documents. Starting from an original repository of documents, DARD automatically generates a new deceptive repository that misleads popular automatic approaches, resulting in clusters of documents that are significantly different from the actual ones. By utilizing this approach, DARD aims to hinder the accurate clustering and the identification of the topic of documents by adversaries relying on automated techniques. The paper presents four deceptive operations (Basic Shuffle, Shuffle increment, Shuffle reduction, and Change topic) that DARD leverages to create a deceptive repository. We evaluate the efficacy of our approach by considering three different types of adversaries, each possessing varying levels of knowledge and expertise. Through extensive experiments, we show that the DARD system can deceive both automatic topic modeling and document clustering techniques, including widely-used commercial tools such as Amazon Comprehend. Hence, our solution provides a robust defense mechanism against Intellectual Property (IP) theft

81	By forecasting future sales patterns and offering in-depth industry insights, this project uses artificial intelligence to transform marketing and sales analytics. The system delivers extremely accurate projections by analyzing historical sales data, market conditions, consumer behavior, and economic indicators through the integration of machine learning models with data visualization tools. The efficacy of the approach in detecting critical elements impacting sales and forecasting future trends, even in highly variable circumstances, is illustrated through a case study focusing on the retail market segment. With its expanded AI capabilities, the system helps businesses drive growth and optimize strategy by providing comprehensive market data, greater forecast accuracy, and actionable insights through easy visualizations. In order to create an even more powerful market analysis platform, future improvements will concentrate on real-time analytics and integrating external data sources. Furthermore, the system's user-friendly interface makes it easy for departments of all sizes to adopt it, and its scalability guarantees that it can accommodate organizations of all sizes. This project could be developed in the flask environment for the user interface.
82	On-Road Vehicle Breakdown Assistance Finder using Python is a practical web application designed to help drivers quickly locate and request assistance in the event of a vehicle breakdown. This system leverages Python’s robust web development capabilities to provide a seamless interface for users who need roadside help. The application features a user-friendly interface where drivers can input their location details, vehicle information, and the nature of the breakdown. Python's integration with geolocation APIs allows the app to accurately pinpoint the user's location and identify nearby service providers, such as towing companies or roadside assistance teams. Using frameworks like Flask or Django for backend management, the app processes user requests, matches them with available service providers, and facilitates real-time communication between the driver and the assistance team. Additionally, the system can include features such as automated notifications to the nearest service provider, estimated arrival times, and live tracking of assistance vehicles. By providing this immediate and efficient support, the On-Road Vehicle Breakdown Assistance Finder enhances driver safety and convenience, ensuring that help is quickly on the way in critical situations.
83	We address the problem of indexing encrypted data outsourced to an external cloud server to support server-side execution of multi-attribute queries. Our approach partitions the dataset in groups with the same number of tuples, and associates all tuples in a group with the same combination of index values, so to guarantee protection against static inferences. Our indexing approach does not require any modifications to the server-side software stack, and requires limited storage at the client for query support. The experimental evaluation considers, for the storage of the encrypted and indexed dataset, both a relational database (PostgreSQL) and a key-value database (Redis). We carried out extensive experiments evaluating client-storage requirements and query performance. The experimental results confirm the efficiency of our solution. The proposal is supported by an open source implementation.
84	AI-Driven Battery Management and Optimization Technique using Python leverages advanced artificial intelligence to enhance the performance and longevity of battery systems in various applications, from electric vehicles to renewable energy storage. Utilizing Python’s powerful machine learning and data analysis libraries, such as TensorFlow and Scikit-learn, this system employs AI algorithms to monitor and optimize battery health and efficiency.

85	Distributed Denial of Service (DDoS) attacks pose a significant threat to the stability and reliability of online systems. Effective and early detection of such attacks is pivotal for safeguarding the integrity of networks. In this work, we introduce an enhanced approach for DDoS attack detection by leveraging the capabilities of Deep Residual Neural Networks (ResNets) coupled with synthetic oversampling techniques. Because of the inherent class imbalance in many cyber-security datasets, conventional methods often struggle with false negatives, misclassifying subtle DDoS patterns as benign. By applying the Synthetic Minority Over-sampling Technique (SMOTE) to the CICIDS dataset, we balance the representation of benign and malicious data points, enabling the model to better discern intricate patterns indicative of an attack. Our deep residual network, tailored for this specific task, further refines the detection process. Experimental results on a real-world dataset demonstrate that our approach achieves an accuracy of 99.98%, significantly outperforming traditional methods. This work underscores the potential of combining advanced data augmentation techniques with deep learning models to bolster cyber-security defenses.
86	Brain hemorrhage refers to a potentially fatal medical disorder that affects millions of individuals. The percentage of patients who survive can be significantly raised with the prompt identification of brain hemorrhages, due to image-guided radiography, which has emerged as the predominant treatment modality in clinical practice. A Computed Tomography Image has frequently been employed for the purpose of identifying and diagnosing neurological disorders. The manual identification of anomalies in the brain region from the Computed Tomography Image demands the radiologist to devote a greater amount of time and dedication. In the most recent studies, a variety of techniques rooted in Deep learning and traditional Machine Learning have been introduced with the purpose of promptly and reliably detecting and classifying brain hemorrhage. This overview provides a comprehensive analysis of the surveys that have been conducted by utilizing Machine Learning and Deep Learning. This research focuses on the main stages of brain hemorrhage, which involve preprocessing, feature extraction, and classification, as well as their findings and limitations. Moreover, this in-depth analysis provides a description of the existing benchmark datasets that are utilized for the analysis of the detection process. A detailed comparison of performances is analyzed. Moreover, this paper addresses some aspects of the above-mentioned technique and provides insights into prospective possibilities for future research.
87	Exploiting spectral–spatial information and reducing the number of required training samples are important for improving tree species classification performance in hyperspectral images. In this article, an active learning-based spectral–spatial classification (ALSSC) model is proposed to reduce the demand for training samples while improving the classification performance. To improve classification performance, the proposed ALSSC employs two ways to exploit spectral–spatial information within the hyperspectral image: 1) features used in classification are extracted from multiscale superpixels; 2) the classification result is refined by guided filtering and subsequently employed as the input for the next round of classification. To reduce the demand for training samples, after each round of classification, active learning (AL) is adopted to select the most informative samples from the unlabeled testing set to enrich the training set. To validate the effectiveness of the proposed ALSSC, experiments are conducted using a tree species classification dataset collected by an airborne hyperspectral sensor. Remarkably, when compared to the state-of-the-art AL-based approach using the same number of labeled samples, the ALSSC demonstrates an accuracy improvement of 11.62%. In addition, trained with fewer labeled samples, the ALSSC outperforms state-of-the-art spectral–spatial classification methods that do not incorporate AL.

88	We study automated intrusion response and formulate the interaction between an attacker and a defender as an optimal stopping game where attack and defense strategies evolve through reinforcement learning and self-play. The game-theoretic modeling enables us to find defender strategies that are effective against a dynamic attacker, i.e. an attacker that adapts its strategy in response to the defender strategy. Further, the optimal stopping formulation allows us to prove that optimal strategies have threshold properties. To obtain near-optimal defender strategies, we develop Threshold Fictitious Self-Play (T-FP), a fictitious self-play algorithm that learns Nash equilibria through stochastic approximation. We show that T-FP outperforms a state-of-the-art algorithm for our use case. The experimental part of this investigation includes two systems: a simulation system where defender strategies are incrementally learned and an emulation system where statistics are collected that drive simulation runs and where learned strategies are evaluated. We argue that this approach can produce effective defender strategies for a practical IT infrastructure
89	Automated colorectal cancer (CRC) segmentation in medical imaging is the key to achieving automation of CRC detection, staging, and treatment response monitoring. Compared with magnetic resonance imaging (MRI) and computed tomography colonography (CTC), conventional computed tomography (CT) has enormous potential because of its broad implementation, superiority for the hollow viscera (colon), and convenience without needing bowel preparation. However, the segmentation of CRC in conventional CT is more challenging due to the difficulties presenting with the unprepared bowel, such as distinguishing the colorectum from other structures with similar appearance and distinguishing the CRC from the contents of the colorectum. To tackle these challenges, we introduce DeepCRC-SL, the first automated segmentation algorithm for CRC and colorectum in conventional contrast-enhanced CT scans. We propose a topology-aware deep learning-based approach, which builds a novel 1-D colorectal coordinate system and encodes each voxel of the colorectum with a relative position along the coordinate system. We then induce an auxiliary regression task to predict the colorectal coordinate value of each voxel, aiming to integrate global topology into the segmentation network and thus improve the colorectum's continuity. Self-attention layers are utilized to capture global contexts for the coordinate regression task and enhance the ability to differentiate CRC and colorectum tissues. Moreover, a coordinate-driven self-learning (SL) strategy is introduced to leverage a large amount of unlabeled data to improve segmentation performance. We validate the proposed approach on a dataset including 227 labeled and 585 unlabeled CRC cases by fivefold cross-validation. Experimental results demonstrate that our method outperforms some recent related segmentation methods and achieves the segmentation accuracy in DSC for CRC of 0.669 and colorectum of 0.892, reaching to the performance
90	This article proposes crack segmentation augmented by super-resolution (SR) with deep neural networks. In the proposed method, an SR network is jointly trained with a binary segmentation network in an end-to-end manner. This joint learning allows the SR network to be optimized for improving segmentation results. For realistic scenarios, the SR network is extended from nonblind to blind for processing a low-resolution (LR) image degraded by unknown blurs. The joint network is improved by our proposed two extra paths that further encourage the mutual optimization between SR and segmentation. Comparative experiments with state-of-the-art (SoTA) segmentation methods demonstrate the superiority of our joint learning, and various ablation studies prove the effects of our contributions.

Doing high throughput high accuracy metrology in small geometries is challenging. One approach is to build easily measurable proxy targets onto dies and make a predictive model based on those signals. We use optical Pattern Shift Response (PSR) proxy targets to build predictive models of the electrical characteristics of devices in the Back End Of Line (BEOL). Given the wide choice of PSR targets, we explore how to select combinations of them to maximise the utility of the features for building an accurate Machine Learning (ML) model; we call this approach Multiplexed Optical Metrology. We also explore the trade-off between chip area dedicated to targets and achievable accuracy. We run ML experiments using different selections of targets measured at different stages of BEOL processing: post-lithography and post-Chemical-Mechanical-Planarisation (CMP). Our results show that a) reasonable predictive performance can be achieved for a reasonable area budget; b) ML model performance across target families varies significantly, thus justifying the need for careful selection of targets; c) longitudinal measurements of targets increases accuracy for no extra area penalty; d) increasing the number of targets gives some improvement in accuracy for a dataset of this size, but relatively small compared to the increase in area budget needed. Ultimately we aim to do die-level yield prediction using these techniques. We discuss how collecting a larger dataset with appropriate yield information is the logical next step to achieving this.

92	Robot-assisted motor training is applied for neurorehabilitation in stroke patients, using motor imagery (MI) as a representative paradigm of brain-computer interfaces to offer real-life assistance to individuals facing movement challenges. However, the effectiveness of training with MI may vary depending on the location of the stroke lesion, which should be considered. This paper introduces a multi-task electroencephalogram-based heterogeneous ensemble learning (MEEG-HEL) specifically designed for cross-subject training. In the proposed framework, common spatial patterns were used for feature extraction, and the features according to stroke lesions are shared and selected through sequential forward floating selection. The heterogeneous ensembles were used as classifiers. Nine patients with chronic ischemic stroke participated, engaging in MI and motor execution (ME) paradigms involving finger tapping. The classification criteria for the multi-task were established in two ways, taking into account the characteristics of stroke patients. In the cross-subject session, the first involved a direction recognition task for two-handed classification, achieving a performance of 0.7419 (±0.0811) in MI and 0.7061 (±0.1270) in ME. The second task focused on motor assessment for lesion location, resulting in a performance of 0.7457 (±0.1317) in MI and 0.6791 (±0.1253) in ME. Comparing the specific-subject session, except for ME on the motor assessment task, performance on both tasks was significantly higher than the cross-subject session. Furthermore, classification performance was similar to or statistically higher in cross-subject sessions compared to baseline models. The proposed MEEG-HEL holds promise in improving the practicality of neurorehabilitation in clinical settings and facilitating the detection of lesions

93	The Django-Parking Management System utilizing YOLO (You Only Look Once) represents an advanced solution for optimizing and automating parking operations through cutting-edge computer vision technology and the robust Django framework. This system integrates YOLO, a real-time object detection algorithm, to monitor and manage parking spaces effectively by identifying and tracking vehicles as they enter and exit parking facilities. The Django-based application serves as the central platform for managing parking lot operations, including real-time space availability, vehicle tracking, and automated billing processes. Through the integration of YOLO, the system can accurately detect and classify vehicles, providing dynamic updates on parking space occupancy and ensuring efficient use of available spaces. Users can access the application via a web interface to view current parking space statuses, make reservations, and receive notifications about space availability. Additionally, the backend system, powered by Django, ensures secure data management, user authentication, and scalability, allowing the system to handle large volumes of parking data and user interactions seamlessly. By combining the real-time capabilities of YOLO with the comprehensive management features of Django, this system enhances the efficiency and convenience of parking management, offering a modern and automated solution to traditional parking challenges.
94	SBERT: Sentence-BERT for Text Summarization is a Flask-based web application that utilizes Sentence-BERT (SBERT) to generate concise and coherent summaries of lengthy texts. Leveraging SBERT's advanced natural language understanding capabilities, the application processes user-provided documents or input text to create meaningful summaries while preserving key information and context. The Flask framework supports the backend operations, handling text input, processing through SBERT, and delivering summarized output through an intuitive web interface. Users can easily submit text or upload documents, and the application swiftly generates summaries that capture the essence of the content. By integrating SBERT's deep learning model with Flask, the application offers an efficient and effective tool for text summarization, making it valuable for researchers, students, and professionals who need to distill large volumes of text into accessible and actionable insights.
95	Advanced AI-Based Robot Navigation in Maze Detection using Python focuses on developing a sophisticated system for autonomous robots to navigate maze environments efficiently while avoiding obstacles. Utilizing Python’s robust machine learning libraries, such as TensorFlow and Scikit-learn, this system leverages advanced AI algorithms like reinforcement learning and pathfinding techniques to enable the robot to detect and traverse optimal paths. The AI models analyze real-time data from sensors and cameras to map the maze, identify obstacles, and determine a clear route. The robot continuously learns and adapts its navigation strategy based on feedback and environmental changes, ensuring accurate and obstacle-free pathfinding. This approach not only enhances the robot's ability to navigate complex mazes but also improves overall efficiency and adaptability in dynamic and challenging environments.
96	Artificial Intelligence-Based Customer Churn Prediction Model for Business Market using Python is an advanced analytical tool designed to forecast customer retention and identify potential churners in the business market. Utilizing Python's powerful machine learning libraries such as Scikit-learn, TensorFlow, and Pandas, this model employs sophisticated algorithms to analyze customer behavior and predict the likelihood of churn.

97	This article aims to study intrusion attacks and then develop a novel cyberattack detection framework to detect cyberattacks at the network layer (e.g., Brute Password and Flooding of Transactions) of blockchain networks. Specifically, we first design and implement a blockchain network in our laboratory. This blockchain network will serve two purposes, i.e., to generate the real traffic data (including both normal data and attack data) for our learning models and to implement real-time experiments to evaluate the performance of our proposed intrusion detection framework. To the best of our knowledge, this is the first dataset that is synthesized in a laboratory for cyberattacks in a blockchain network. We then propose a novel collaborative learning model that allows efficient deployment in the blockchain network to detect attacks. The main idea of the proposed learning model is to enable blockchain nodes to actively collect data, learn the knowledge from data using the Deep Belief Network, and then share the knowledge learned from its data with other blockchain nodes in the network. In this way, we can not only leverage the knowledge from all the nodes in the network but also do not need to gather all raw data for training at a centralized node like conventional centralized learning solutions. Such a framework can also avoid the risk of exposing local data's privacy as well as excessive network overhead/congestion. Both intensive simulations and real-time experiments clearly show that our proposed intrusion detection framework can achieve an accuracy of up to 98.6% in detecting attacks
98	Condition-based maintenance is a decision-making strategy using condition monitoring information to optimize the availability of operational plants. In this context, machine learning techniques are useful and have been used in predicting the remaining useful life (RUL) of equipment to ensure the overall safety and reliability of the system through maintenance policies and, consequently, reducing costs arising from the failure. These databases are not large which is tricky for data-driven models. In this study, we consider five different databases containing the failure times from distinct real-world equipment. Here, four different regression algorithms were compared for RUL prediction, namely: Support Vector Regression (SVR), Decision Tree (DT), Multilayer Perceptron (MLP) and K-Nearest Neighbors (KNN). Furthermore, aiming to improve the data quality, the Empirical Mode Decomposition (EMD) was used, which is responsible for pre-processing the input data used on the predictive modeling. We optimize the models hyperparameters using grid-search cross-validation algorithm and the performance of each model is compared using the normalized root mean squared error (NRMSE). Considering the datasets analyzed, KNN model proves to be the most promising to perform the prognostic task in small datasets, adapting itself to the distinct characteristics of the different databases. In addition, we mention the better performance after optimizing the hyperparameters, which avoided overfitting problems and had a low computational cost for the problems analyzed here.
99	Real-Time Translation Tool using Python is an advanced application designed to instantly translate text into multiple languages, enhancing global communication and accessibility. Leveraging robust Python libraries such as googletrans for Google Translate API, TextBlob, and transformers for advanced neural translation models, the tool delivers seamless real-time translations. By integrating state-of-the-art machine learning and natural language processing techniques, the system accurately translates text across a broad range of languages, allowing users to input text and receive instant translations. Its user-friendly interface supports smooth and effective multilingual interactions, making it an invaluable resource for travelers, international businesses, and anyone needing to bridge language barriers. Combining Python’s powerful capabilities with cutting-edge translation technologies, the tool ensures accurate and timely translations, facilitating effortless communication across different languages.

100	Major Depression Disorder (MDD) is a common yet destructive mental disorder that affects millions of people worldwide. Making early and accurate diagnosis of it is very meaningful. Recently, EEG, a non-invasive technique of recording spontaneous electrical activity of brains, has been widely used for MDD diagnosis. However, there are still some challenges in data quality and data size of EEG: (1) A large amount of noise is inevitable during EEG collection, making it difficult to extract discriminative features from raw EEG; (2) It is difficult to recruit a large number of subjects to collect sufficient and diverse data for model training. Both of the challenges cause the overfitting problem, especially for deep learning methods. In this paper, we propose DiffMDD, a diffusion-based deep learning framework for MDD diagnosis using EEG. Specifically, we extract more noise-irrelevant features to improve the model's robustness by designing the Forward Diffusion Noisy Training Module. Then we increase the size and diversity of data to help the model learn more generalized features by designing the Reverse Diffusion Data Augmentation Module. Finally, we re-train the classifier on the augmented dataset for MDD diagnosis. We conducted comprehensive experiments to test the overall performance and each module's effectiveness. The framework was validated on two public MDD diagnosis datasets, achieving the state-of-the-art performance.
101	AI-based Network Intrusion Detection Systems (NIDS) provide effective mechanisms for cybersecurity analysts to gain insights and thwart several network attacks. Although current IDS can identify known/typical attacks with high accuracy, current research shows that such systems perform poorly when facing atypical and dynamically changing (polymorphic) attacks. In this paper, we focus on improving detection capability of the IDS for atypical and polymorphic network attacks. Our system generates adversarial polymorphic attacks against the IDS to examine its performance and incrementally retrains it to strengthen its detection of new attacks, specifically for minority attack samples in the input data. The employed attack quality analysis ensures that the adversarial atypical/polymorphic attacks generated through our system resemble original network attacks. We showcase the high performance of the IDS that we have proposed by training it using the CICIDS2017 and CICIoT2023 benchmark datasets and evaluating its performance against several atypical/polymorphic attack flows. The results indicate that the proposed technique, through adaptive training, learns the pattern of dynamically changing atypical/polymorphic attacks, identifies such attacks with approximately 90% balanced accuracy for most of the cases, and surpasses various state-of-the-art detection and class balancing techniques.
102	Control Me: Voice Assistance for System Controls using Python is an advanced application designed to enable hands-free management of system functions through voice commands. Leveraging Python's powerful libraries, such as SpeechRecognition and pyttsx3, this system provides a seamless interface for users to control various aspects of their computer or application environment using natural language. The application processes spoken commands to perform tasks such as opening applications, adjusting system settings, and executing predefined functions. By integrating speech-to-text and text-to-speech technologies, Control Me offers an intuitive and accessible way to interact with systems, making it especially beneficial for users with physical disabilities or those seeking enhanced productivity. The backend handles voice input, command parsing, and action execution, ensuring responsive and accurate system control. With its user-friendly design and reliable performance, Control Me transforms voice interactions into effective system management tools, enhancing user convenience and accessibility.

103	A Collaborative AI and ML Technique to Predict Good Quality Products and Recommend to Users using Python is an advanced system designed to enhance product recommendations by leveraging collaborative filtering and machine learning techniques. This application combines the power of AI with data-driven insights to predict and suggest high-quality products tailored to individual user preferences.
104	Machine learning poses severe privacy concerns as it has been shown that the learned models can reveal sensitive information about their training data. Many works have investigated the effect of widely adopted data augmentation and adversarial training techniques, termed data enhancement in the paper, on the privacy leakage of machine learning models. Such privacy effects are often measured by membership inference attacks (MIAs), which aim to identify whether a particular example belongs to the training set or not. We propose to investigate privacy from a new perspective called memorization. Through the lens of memorization, we find that previously deployed MIAs produce misleading results as they are less likely to identify samples with higher privacy risks as members compared to samples with low privacy risks. To solve this problem, we deploy a recent attack that can capture individual samples' memorization degrees for evaluation. Through extensive experiments, we unveil several findings about the connections between three essential properties of machine learning models, including privacy, generalization gap, and adversarial robustness. We demonstrate that the generalization gap and privacy leakage are less correlated than those of the previous results. Moreover, there is not necessarily a trade-off between adversarial robustness and privacy as stronger adversarial robustness does not make the model more susceptible to privacy attacks
105	Text sentiment analysis is an important task in natural language processing and has always been a hot research topic. However, in low-resource regions such as South Asia, where languages like Bengali are widely used, the research interest is relatively low compared to high-resource regions due to limited computational resources, flexible word order, and high inflectional nature of the language. With the development of quantum technology, quantum machine learning models leverage the superposition property of qubits to enhance model expressiveness and achieve faster computation compared to classical systems. To promote the development of quantum machine learning in low-resource language domains, we propose a quantum–classical hybrid architecture. This architecture utilizes a pretrained multilingual bidirectional encoder representations from transformer (BERT) model to obtain vector representations of words and combines the proposed batch upload quantum recurrent neural network (BUQRNN) and parameter nonshared batch upload quantum recurrent neural network (PN-BUQRNN) as feature extraction models for sentiment analysis in Bengali. Our numerical results demonstrate that the proposed BUQRNN structure achieves a maximum accuracy improvement of 0.993% in Bengali text classification tasks while reducing average model complexity by 12%. The PN-BUQRNN structure surpasses the BUQRNN structure once again and outperforms classical architectures in certain tasks.

106	This article is concerned with the secure distributed economic dispatch (DED) problem of microgrids. A quantized distributed optimization algorithm using the Paillier encryption–decryption scheme is developed. This algorithm is designed to optimally coordinate the power outputs of a collection of distributed generators (DGs) in order to meet the total load demand at the lowest generation cost under the DG capacity limits while ensuring communication efficiency and security. First, to facilitate data encryption and reduce data release, a novel dynamic quantization scheme is integrated into the DED algorithm, through which the effects of quantization errors can be eliminated. Next, utilizing matrix norm analysis and mathematical induction, a sufficient condition is provided to demonstrate that the developed DED algorithm converges precisely to the optimal solution under finite quantization levels (and even the three-level quantization using sign transmissions). Moreover, an encryption–decryption scheme is developed based on quantized outputs, which ensures confidential communication by leveraging the homomorphic property of the Paillier cryptosystem. Finally, the effectiveness and superiority of the implemented secure distributed algorithm are confirmed through a simulated example
107	The widespread success of deep learning in solving machine learning problems has fueled its adoption in many fields, from speech recognition to drug discovery and medical imaging. However, deep learning systems are extremely fragile: imperceptibly small modifications to their input data can cause the models to produce erroneous output. It is very easy to generate such adversarial perturbations even for state-of-the-art models, yet immunization against them has proven exceptionally challenging. Despite over a decade of research on this problem, our solutions are still far from satisfactory and many open problems remain. In this work, we survey some of the most important contributions in the field of adversarial robustness. We pay particular attention to the reasons why past attempts at improving robustness have been insufficient, and we identify several promising areas for future research.
108	Smart Finder: A Spam Detection Method in Messages Using AI with Python is an innovative application designed to identify and filter out spam messages with high accuracy. Leveraging advanced AI algorithms and machine learning techniques, this system analyzes incoming messages to detect patterns and characteristics typical of spam. Utilizing Python's powerful libraries, such as TensorFlow and scikit-learn, the application is trained on large datasets of labeled messages to distinguish between legitimate content and unwanted spam. The AI-driven backend processes messages in real-time, applying sophisticated classification models to flag or filter out spam content while allowing legitimate messages to pass through. This ensures users receive only relevant and useful communications, significantly reducing the risk of phishing attacks, unwanted advertisements, and other types of malicious content. By continually learning and adapting from new data, Smart Finder enhances its detection capabilities, providing a reliable and efficient solution for managing and securing digital communication.

109	An Efficient Recommendation of User Wishlist Using AI with Python is a cutting-edge system designed to enhance user experience by providing personalized recommendations based on their wishlist preferences. Utilizing advanced AI algorithms, the system analyzes user behavior, past interactions, and wishlist data to generate accurate and relevant suggestions for products or services. Python's powerful libraries, such as TensorFlow and scikit-learn, are employed to build and train machine learning models that predict user interests and recommend items that align with their preferences. The system's backend processes data in real-time, offering dynamic and adaptive recommendations that improve over time as more data is collected. Users benefit from a tailored shopping experience, receiving suggestions that are closely aligned with their individual tastes and interests. This AI-driven approach not only enhances user satisfaction but also drives engagement and increases conversion rates by presenting users with products they are more likely to find appealing and relevant.
110	OSTR: Online Survey Tool and Review is a robust Flask-based web application designed to facilitate the creation, distribution, and analysis of online surveys and reviews. This tool allows users to design customized surveys with various question formats, distribute them to target audiences, and collect responses in real time. The Flask framework provides a solid backend for managing survey data, user submissions, and real-time analytics. Users can create surveys with multiple question types, such as multiple-choice, open-ended, and Likert scale questions, and customize survey templates to fit specific needs. The application also includes features for generating detailed reports and visualizations, enabling users to analyze survey results and review feedback efficiently. By integrating these functionalities, OSTR streamlines the process of gathering and evaluating feedback, making it an invaluable resource for researchers, businesses, and organizations seeking to gain insights and improve decision-making through data-driven surveys and reviews.
111	A problem with machine learning (ML) techniques for detecting intrusions in the Internet of Things (IoT) is that they are ineffective in the detection of low-frequency intrusions. In addition, as ML models are trained using specific attack categories, they cannot recognize unknown attacks. This article integrates strategies of cost-sensitive learning and multitask learning into a hybrid ML model to address these two challenges. The hybrid model consists of an autoencoder for feature extraction and a support vector machine (SVM) for detecting intrusions. In the cost-sensitive learning phase for the class imbalance problem, the hinge loss layer is enhanced to make a classifier strong against low-distributed intrusions. Moreover, to detect unknown attacks, we formulate the SVM as a multitask problem. Experiments on the UNSW-NB15 and BoT-IoT datasets demonstrate the superiority of our model in terms of recall, precision, and F1-score averagely 92.2%, 96.2%, and 94.3%, respectively, over other approaches.
112	Equip Yourself: Expense Tracker is a powerful Flask-based web application designed to help users manage and monitor their financial expenditures effectively. This application provides a user-friendly platform where individuals can record their daily expenses, categorize them into different spending types, and track their budget in real time. Utilizing Flask's robust backend capabilities, the app securely handles user data, enabling features such as expense entry, budget setting, and financial reporting. Users can visualize their spending habits through interactive charts and graphs, set financial goals, and receive insights into their spending patterns. The application also includes tools for generating detailed reports and exporting data for further analysis. By offering a comprehensive suite of features for expense tracking and financial management, Equip Yourself empowers users to make informed financial

	decisions, manage their budgets efficiently, and achieve better control over their personal finances.
113	Artificial Intelligence-Based Language Translation Platform using Python is a cutting-edge application designed to facilitate seamless and accurate translation across multiple languages. Powered by Python's robust libraries such as TensorFlow, Transformers, and NLTK, this platform leverages advanced artificial intelligence and deep learning techniques to provide high-quality translations in real-time. The system utilizes sophisticated neural network models and natural language processing algorithms to understand and translate text with nuanced contextual accuracy. Users can input text in one language and receive instant translations in their desired language, supported by features such as context-aware translation, language detection, and adaptive learning. The platform is designed to handle diverse linguistic challenges, including idiomatic expressions and complex sentence structures, ensuring reliable and contextually appropriate translations. By combining Python's powerful data processing capabilities with AI-driven translation technology, this platform offers a versatile and efficient solution for global communication, making it an invaluable tool for businesses, educators, and individuals seeking accurate and responsive language translation.
114	Medical healthcare centers are envisioned as a promising paradigm to handle vast data for various disease diagnoses using artificial intelligence. Traditional Machine Learning algorithms have been used for years, putting the sensitivity of patients' medical data privacy at risk. Collaborative data training , where multiple hospitals (nodes) train and share encrypted federated models, solves the issue of data leakage and unites resources of small and large hospitals from distant areas. This study introduces an innovative framework that leverages blockchain-based Federated Learning to identify 15 distinct lung diseases, ensuring the preservation of privacy and security. The proposed model has been trained on the NIH Chest Ray dataset (112 120 X-Ray images), tested, and evaluated, achieving test accuracy of 92.86%, a latency of 43.518625 ms, and a throughput of 10034017 bytes/s. Furthermore, we expose our framework blockchain to stringent empirical tests against leading cyber threats to evaluate its robustness. With resilience metrics consistently nearing 87% against three evaluated cyberattacks, the proposed framework demonstrates significant robustness and potential for healthcare applications. To the best of our knowledge, this is the first paper on the practical implementation of blockchain-empowered FL with such data and several diseases, including multiple disease coexistence detection.

115	Customer Relationship Management (CRM) by Sentiment Analysis using AI Technology is a sophisticated approach designed to enhance customer interactions and satisfaction through advanced analytics. By leveraging artificial intelligence and machine learning algorithms, this system analyzes customer feedback, reviews, and communications to gauge sentiment and emotional tone. The AI-powered sentiment analysis tool processes large volumes of textual data, identifying positive, negative, and neutral sentiments with high accuracy. This real-time analysis enables businesses to understand customer perceptions, track satisfaction trends, and respond proactively to concerns. Python-based libraries like NLTK and SpaCy facilitate natural language processing, while machine learning models are trained to detect nuanced emotions and sentiments. The CRM system integrates these insights into actionable strategies, allowing companies to tailor their customer service approaches, address issues promptly, and improve overall engagement. By incorporating sentiment analysis into CRM, businesses can build stronger relationships with their customers, enhance service quality, and drive long-term loyalty through informed and empathetic interactions.
116	A Prior Forecasting of Stock Market Range Using AI Methods in Recent Trends with Python is an advanced application designed to predict stock market fluctuations by leveraging artificial intelligence techniques. This system utilizes sophisticated machine learning algorithms and data analysis methods to forecast the potential range of stock prices based on historical data and current market trends. Employing Python's powerful libraries, such as Pandas for data manipulation, Scikit-learn for predictive modeling, and TensorFlow for deep learning, the application processes vast amounts of financial data to generate accurate predictions. By analyzing patterns, market indicators, and historical performance, the AI-driven backend provides insights into potential price movements and trading ranges. The forecasting model continuously updates with new data, adapting to evolving market conditions to enhance prediction accuracy. This tool empowers investors and analysts with valuable information to make informed decisions, manage risk, and optimize trading strategies by providing a clear view of possible future stock price ranges.
117	Place of Customer: AI-Based Customer Satisfaction Monitoring System using Python is an advanced application designed to gauge and enhance customer satisfaction through artificial intelligence. This system leverages AI technologies to analyze customer feedback, interactions, and behavior to provide real-time insights into customer satisfaction levels. Utilizing Python’s robust libraries, such as Natural Language Processing (NLP) with NLTK or SpaCy, and machine learning frameworks like Scikit-learn and TensorFlow, the application processes and interprets textual feedback from various sources, including surveys, reviews, and social media comments. The AI algorithms detect sentiment, identify key issues, and categorize feedback into actionable insights. The backend continuously monitors customer sentiment trends and provides detailed reports and visualizations to help businesses understand customer perceptions and address concerns effectively. By integrating these AI-driven capabilities, the system enables proactive measures to improve customer service, enhance user experiences, and foster long-term customer loyalty.

118	AI Face Enhancer using Python is a sophisticated application designed to improve and enhance facial images through advanced artificial intelligence techniques. Utilizing Python's deep learning libraries, such as TensorFlow and OpenCV, this system applies state-of-the-art algorithms to automatically enhance facial features, adjust lighting, remove imperfections, and apply aesthetic modifications. The AI models are trained on extensive datasets to understand and accurately process facial characteristics, enabling real-time enhancement of image quality while preserving natural look and feel. The application provides intuitive controls for users to adjust enhancement levels, apply filters, and achieve professional-grade results. By leveraging AI's capability to intelligently process and enhance facial images, the Face Enhancer offers a powerful tool for applications in photography, social media, and digital content creation, ensuring high-quality visual outcomes.
119	CircRNA has been proved to play an important role in the diseases diagnosis and treatment. Considering that the wet-lab is time-consuming and expensive, computational methods are viable alternative in these years. However, the number of circRNA-disease associations (CDAs) that can be verified is relatively few, and some methods do not take full advantage of dependencies between attributes. To solve these problems, this paper proposes a novel method based on Kernel Fusion and Deep Auto-encoder (KFDAE) to predict the potential associations between circRNAs and diseases. Firstly, KFDAE uses a non-linear method to fuse the circRNA similarity kernels and disease similarity kernels. Then the vectors are connected to make the positive and negative sample sets, and these data are send to deep auto-encoder to reduce dimension and extract features. Finally, three-layer deep feedforward neural network is used to learn features and gain the prediction score. The experimental results show that compared with existing methods, KFDAE achieves the best performance. In addition, the results of case studies prove the effectiveness and practical significance of KFDAE, which means KFDAE is able to capture more comprehensive information and generate credible candidate for subsequent wet-lab.
120	The configuration of security systems for communication protection, such as VPNs, is traditionally performed manually by human beings. However, because the complexity of this task becomes soon difficult to manage when its size increases, critical errors that may open the door to cyberattacks may be introduced. Moreover, even when a solution is computed correctly, sub-optimizations that may afflict the performance of the configured VPNs may be introduced. Unfortunately, the possible solution that consists in automating the definition of VPN configurations has been scarcely studied in literature so far. Therefore, this paper proposes an automatic approach to compute the configuration of VPN systems. Both the allocation scheme of VPN systems in the network and their protection rules are computed automatically. This result is achieved through the formulation of a Maximum Satisfiability Modulo Theories problem, which provides both formal correctness-by-construction and optimization of the result. A framework implementing this approach has been developed, and its experimental validation showed that it is a valid alternative for replacing time-consuming and error-prone human operations for significant problem sizes.

121	Collaborative representation (CR) models have been widely used in hyperspectral image (HSI) classification tasks. However, most CR classification models lack stability and generalization when targeting small samples as well as spatial homogeneity and heterogeneity problems. Therefore, this article proposes a mean-weighted CR classification model (MWCRC) based on the joint spatial-spectral data. It imposes mean and weighted constraints on the representation coefficients based on CR, which attenuates the noise effect and increases the distinguishability between classes. Second, a sample augmentation method based on the principle of minimizing the representation residuals is proposed. Sample augmentation is realized through initial classification and calculation of representation residuals to achieve the objective of consolidating model stability and improving classification accuracy. Meanwhile, in order to alleviate the problem of spatial homogeneity and heterogeneity, the extended morphological profile (EMP) and the stacking approach are utilized to construct the joint spatial-spectral data for the classification of MWCRC. The superiority of the proposed method is demonstrated by experimental validation using a small number of training samples in three real datasets.
122	Beauty Sketchy is an innovative Flask-based web application that transforms photos into artistic sketches using Python. This application harnesses advanced image processing and machine learning algorithms to convert ordinary images into detailed, hand-drawn-style sketches, providing users with a creative and artistic way to enhance their photos. The Flask framework serves as the backbone of the app, enabling seamless image uploads, processing, and downloading through a user-friendly web interface. Users can easily upload their images, select various sketch styles, and apply real-time adjustments to achieve the desired artistic effect. The application leverages Python's powerful libraries for image manipulation and machine learning, ensuring high-quality results and efficient processing. By combining these technologies within a Flask environment, Beauty Sketchy delivers an accessible and engaging tool for users looking to create beautiful, customized sketches from their photos, making it a valuable resource for both personal and professional creative projects.
123	Computational biomechanical analysis plays a pivotal role in understanding and improving human movements and physical functions. Although physics-based modeling methods can interpret the dynamic interaction between the neural drive to muscle dynamics and joint kinematics, they suffer from high computational latency. In recent years, data-driven methods have emerged as a promising alternative due to their fast execution speed, but label information is still required during training, which is not easy to acquire in practice. To tackle these issues, this paper presents a novel physics-informed deep learning method to predict muscle forces without any label information during model training. In addition, the proposed method could also identify personalized muscle-tendon parameters. To achieve this, the Hill muscle model-based forward dynamics is embedded into the deep neural network as the additional loss to further regulate the behavior of the deep neural network. Experimental validations on the wrist joint from six healthy subjects are performed, and a fully connected neural network (FNN) is selected to implement the proposed method. The predicted results of muscle forces show comparable or even lower root mean square error (RMSE) and higher coefficient of determination compared with baseline methods, which have to use the labeled surface electromyography (sEMG) signals, and it can also identify muscle-tendon parameters accurately, demonstrating the effectiveness of the proposed physics-informed deep learning method

124	In recent years, cloud computing has been widely used. Cloud computing refers to the centralized computing resources, users through the access to the centralized resources to complete the calculation, the cloud computing center will return the results of the program processing to the user. Cloud computing is not only for individual users, but also for enterprise users. By purchasing a cloud server, users do not have to buy a large number of computers, saving computing costs. According to a report by China Economic News Network, the scale of cloud computing in China has reached 209.1 billion yuan. At present, the more mature cloud service providers in China are Ali Cloud, Baidu Cloud, Huawei Cloud and so on. Therefore, this paper proposes an innovative approach to solve complex problems in cloud computing resource scheduling and management using machine learning optimization techniques. Through in-depth study of challenges such as low resource utilization and unbalanced load in the cloud environment, this study proposes a comprehensive solution, including optimization methods such as deep learning and genetic algorithm, to improve system performance and efficiency, and thus bring new breakthroughs and progress in the field of cloud computing resource management.Rational allocation of resources plays a crucial role in cloud computing. In the resource allocation of cloud computing, the cloud computing center has limited cloud resources, and users arrive in sequence. Each user requests the cloud computing center to use a certain number of cloud resources at a specific time.
125	A Taste of Tea is a sophisticated web application developed using Python Flask, designed to enhance customer experiences at coffee shops by providing personalized product recommendations and collecting insightful customer reviews. The application operates in two main stages: one for coffee shop management and one for customer interaction. In the first stage, coffee shop managers can use the Flask-based backend to configure and manage their product offerings. They can input detailed information about various tea blends, special promotions, and seasonal offerings. The application employs machine learning algorithms to analyze customer preferences and historical sales data, helping managers optimize their inventory and tailor their product recommendations. This stage includes features for tracking sales performance, managing stock levels, and generating reports that provide actionable insights into customer preferences and trends. In the second stage, customers interact with the application through an engaging web interface. They can browse the coffee shop's product catalog, read and submit reviews, and rate their experiences with different teas. The system uses natural language processing to analyze customer reviews and sentiment, providing valuable feedback to the coffee shop. Based on individual preferences and past interactions, the application offers personalized product recommendations, suggesting new tea blends that align with customers' tastes. By integrating these two stages, A Taste of Tea not only enhances the customer experience through tailored recommendations and interactive reviews but also provides coffee shop managers with the tools and insights needed to refine their offerings and improve customer satisfaction.

126	Feature extraction and accurate classification are crucial tasks in the land-cover classification of the hyperspectral image (HSI). We propose a guided filter (GF) of a random patches network (RPNet) and a relaxed collaborative representation (RCR)-based HSI classification (HSIC) method called GRR. The shallow and deep features are extracted using RPNet that requires no pretraining stage. In addition to the obtained feature set, the original HSI and extracted features are then filtered by GF to preserve the edge details. After that, all the distinct feature sets are separately concatenated with the original HSI to keep the original structure of the data. The high-dimensional feature sets are then processed by a linear discriminant analysis (LDA) to increase class separability and to select the most representative features. Since few train samples are available in the HSIC task, the efficiency of LDA is improved using superpixel segmentation to generate pseudosamples. In the final stage, the reduced-dimension feature sets are classified by the use of superpixel-guided RCR, which utilizes the resemblance and discrimination of the feature sets efficiently. The extensive experiments on the real HSIs are carried out to validate the efficacy of the proposed method.
127	Air pollution is a severe environmental problem in urban areas. Accurate air quality prediction can help governments and individuals make proper decisions to cope with potential air pollution. As a classic time series forecasting model, the AutoRegressive Integrated Moving Average (ARIMA) has been widely adopted in air quality prediction. However, because of the volatility of air quality and the lack of additional context information, i.e., the spatial relationships among monitor stations, traditional ARIMA models suffer from unstable prediction performance. Though some deep networks can achieve higher accuracy, a mass of training data, heavy computing, and time cost are required. In this paper, we propose a hybrid model to simultaneously predict seven air pollution indicators from multiple monitoring stations. The proposed model consists of three components: (1) an extended ARIMA to predict matrix series of multiple air quality indicators from several adjacent monitoring stations; (2) the Empirical Mode Decomposition (EMD) to decompose the air quality time series data into multiple smooth sub-series; and (3) the truncated Singular Value Decomposition (SVD) to compress and denoise the expanded matrix. Experimental results on the public dataset show that our proposed model outperforms the state-of-art air quality forecasting models in both accuracy and time cost.
128	Electroencephalogram (EEG) is widely used in basic and clinical neuroscience to explore neural states in various populations, and classifying these EEG recordings is a fundamental challenge. While machine learning shows promising results in classifying long multivariate time series, optimal prediction models and feature extraction methods for EEG classification remain elusive. Our study addressed the problem of EEG classification under the framework of brain age prediction, applying a deep learning model on EEG time series. We hypothesized that decomposing EEG signals into oscillatory modes would yield more accurate age predictions than using raw or canonically frequency-filtered EEG. Specifically, we employed multivariate intrinsic mode functions (MIMFs), an empirical mode decomposition (EMD) variant based on multivariate iterative filtering (MIF), with a convolutional neural network (CNN) model. Testing a large dataset of routine clinical EEG scans (n = 6540) from patients aged 1 to 103 years, we found that an ad-hoc CNN model without fine-tuning could reasonably predict brain age from EEGs. Crucially, MIMF decomposition significantly improved performance compared to canonical brain rhythms (from delta to lower gamma oscillations). Our approach achieved a mean absolute error (MAE) of 13.76 ± 0.33 and a correlation coefficient of 0.64 ± 0.01 in brain age prediction over the entire lifespan. Our findings indicate that CNN models applied to EEGs, preserving their original temporal structure, remains a

	promising framework for EEG classification, wherein the adaptive signal decompositions such as the MIF can enhance CNN models' performance in this task
129	Real-Time Span Data Recognizer System utilizing AI technology is an advanced application designed to process and analyze data across various spans of time with high precision and efficiency. Leveraging cutting-edge artificial intelligence algorithms, this system enables real-time recognition and interpretation of dynamic data streams, extracting valuable insights from temporal data inputs. The AI-driven backend continuously monitors and processes incoming data, identifying patterns, trends, and anomalies as they occur. The system features a responsive interface for visualizing real-time data analytics, generating instant reports, and providing actionable insights. Its applications range from monitoring financial markets and managing operational data to enhancing decision-making processes in various sectors. By integrating AI technology for real-time data recognition, the system offers a powerful tool for organizations to stay ahead in rapidly changing environments, ensuring timely and informed responses based on up-to-date information.