Proceeding

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وقائع

المؤتمر الدولي الثالث لكلية الامام الكاظم للتطبيقات الحديثة لتكنولوجيا المعلومات والاتصالات

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بغداد/ العراق

MAICT 2024

المؤتمر الدولي الثالث لكلية الأمام الكاظم
للتطبيقات الحديثة لتكنولوجيا المعلومات والاتصالات
المؤتمر الدولي الثالث لكلية الأمام الكاظم
MODERN APPLICATIONS OF INFORMATION AND COMMUNICATION TECHNOLOGY

كلية الإمام الكاظم للعلوم الإسلامية الجامعة / السيد عميد الكلية المحترم

م/ المؤتمر الدولي الثالث لكلية الإمام الكاظم الحديثة لتكنولوجيا المعلومات والاتصالات
(خطة المؤتمرات لعام ٢٠٢٤)

السلام عليكم ورحمة الله وبركاته ...

إشارةً الى كتابكم المرقم بالعدد (٦٥٠) في (٢٠٢٤/٥/١٢) ومرفقه الأوليات الخاصة بمؤتمر جامعتكم أعلاه المزمع إقامته في (٢٧ - ٢٠٢٤/١١/٢٨) وإستناداً الى الضوابط الخاصة بإقامة المؤتمرات التي تم إعمامها بموجب كتابنا المرقم بالعدد (ب ت ت/٥٣٥٩/٢) في (٢٠٢٣/٦/٢١) بشأنه نعلمكم بالموافقة على إقامة المؤتمر.

... مع التقدير

أ.د. لبنى خميس مهدي
المدير العام لدائرة البحث والتطوير
٢٠٢٤/٥/

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- دائرة البحث والتطوير / مكتب المدير العام / للتفضل بالاطلاع ... مع التقدير
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م.م.علي حسين

Important Dates

Start of Research Submission: **1/6/2024**

Deadline for Submission: **1/8/2024**

Initial Acceptance: **1/9/2024**

Final Acceptance: **1/10/2024**

Conference Dates:

27-28/11/2024

MAICT 2024

WE WELCOME ALL RESEARCHERS AND THOSE INTERESTED IN PARTICIPATING AND ATTENDING THIS DISTINGUISHED SCIENTIFIC EVENT

Conference location:

Imam Al-Kadhim University College

Baghdad, Iraq

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https://t.me/MAICT_2021

Researches Publication

Iraqi Journal for Electrical and Electronic Engineering

IJEEE

Scopus

The Mesopotamian Journal of Cybersecurity (MJCS) -Scopus

Mustansiriyah Journal of Pure and Applied Sciences

MJPAS

Journal of Al-Qadisiyah for Computer Science and Mathematics (JQCM) (JQCM)

IMAM AL-KADHIM UNIVERSITY COLLEGE

MAICT 2024

Al Kadhim Third International Conference for Modern Applications of Information and Communications Technology (MAICT)-2024

IMAM AL-KADHIM UNIVERSITY COLLEGE

MAICT 2024

Conference Tracks

Track -01: Networks and Protocols

Track -02: Advanced Communication

Track -03: Electronic and Electrical Engineering

Track -04: IoT and Cloud Computing

Track -05: Artificial Intelligent and Information Systems

Track -06: Cyber Security

Track -07: Applied Science

Imam Alkadhim University College - Department of Computer Engineering Techniques holds a scientific conference title of "Third International Conference of Imam Kadhim university College for Modern Applications of Information and Communications Technology"
The conference will be held on October 2024 in Baghdad, sponsored by Imam Alkadhim College with scientific support by university of Basrah, Mustansiriyah University - College of Education, University of Al Qadisiyah - College of Computer Science And Information Technology and Imam Jaafar Alsadiq University.
This event day is your best opportunity to reach the largest assemblage of participants from academia, students, researchers and industrial professionals. We will be delighted and honored by gathering professionals under one roof with the theme of modern technology and communications. We encourage you to join MAICT2024, it is a great event to connect with various researchers in different fields and discover how fields related to engineering, computer science and applied science.

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		جامعة الامام جعفر الصادق ع	م.م غدير غازي شايع

No.	1
Title	Design capacitive pressure sensor (MEMS) with high sensitivity and linearity for biomedical application
Authors	Mokhalad Alghrairi *1, Emad Hmood Salman 2, Basim Abdul Kareem Farhan 1, Waleed Algriree 3, Hussein Mohammed Ridha 4, Saad Mutashar 5, Nasri Sulaiman
doi	
Abstract	The advancement of pressure sensors customized for purposes marks a notable progress, in the realm of healthcare diagnostics and patient supervision. This article delves into the creation and assessment of a capacitive pressure sensor designed to measure physiological pressures with utmost accuracy and sensitivity. The sensor's structure integrates materials that are compatible with the body to ensure safety and dependability when interacting with bodily tissues. Thorough simulations and validations showcase the sensors performance emphasizing its responsiveness across a spectrum of pressures in medical settings. The assessment encompasses an analysis of the sensor's sensitivity at (92 fF/bar) exceptional linearity within a nonlinearity range of $\pm 0.015\%$ and long-term reliability. The results indicate that the suggested capacitive pressure sensor exhibits promising possibilities for use in fields like blood pressure monitoring, intracranial pressure measurement and other crucial areas of biomedicine providing a nonintrusive and cost-efficient method, for real time health monitoring and diagnostic purposes.

No.	2
Title	IoT Cyber Security of Smart Power Meters
Authors	Emad Hmood Salman*1, Mokhalad Alghrairi2, Hatim G. Abood3, Ali M. Abdelsaheb2, Ahmed Ghandour4, Waleed Algriree5
doi	
Abstract	The Internet of Thing (IoT) technology is considered the air of smart cities. The link inside smart cities is the smart grid, since it controls energy as a side and efficiently uses power. The auction system that distributes the power efficiently according to the smart power meters is the main part of the smart grids. However, cybersecurity during the auction process is considered a significant factor in the performance of efficient distribution. This paper aims to increase the level of cybersecurity and enhance the immunity of the auction process. The mathematical model depends on two factors: The Paillier cryptosystem and the Haar wavelet transform. This transform can be generated as a single resolution to improve cybersecurity and protect the ciphertext from eavesdroppers over IoT. The simulation results reveal that the level of cybersecurity of the proposed auction system is higher than that of related works. In addition, the computational complexity of the proposed system is the lowest since the structure of the Haar Wavelet Transform single-resolution includes just addition, subtraction, and averaging.

No.	3
Title	Excitation Control Enhancement of the Synchronous Generator using effective control methodology
Authors	Hawraa Jasim*1, Kasim Abdalla1
doi	
Abstract	In electrical power plants, excitation control system acts as an important part for controlling output voltage of the synchronous generators. The purpose of this paper is to utilize various methods of excitation control, such as Proportional-Integral-Derivative (PID), Simulated Annealing (SA) and Neural Network (NN) controllers to compare their effectiveness in achieving optimal stability and reliability in generation system. The study involves simulating and optimizing a 2 MVA/400 V synchronous generator driven by a three- phase diesel engine with mechanical coupling and an exciter systems. MATLAB 2021 is used to implement the Simulink model. The dynamic responses of field voltage and current to load changes were analyzed for each control technique. Additionally, the performance of the exciter system's three-phase voltage and current measurements was examined over a 10- second timeframe to validate the functionality of the synchronous machine. Our findings indicate that while conventional PID controllers offer straightforward implementation and reliable performance under stable conditions, NN and SA controllers demonstrate superior adaptability and robustness in handling nonlinearities and transient disturbances. The research underscores the potential of integrating these advanced control techniques in synchronous generators, paving the way for enhanced stability and reliability in modern electric power systems, with further implications for renewable energy integration.

No.	4
Title	A Reliable Value Selection of Excitation Capacitance for a Self-Excited Induction Generator Operating Under Different Fault and Excitation Conditions
Authors	Hayder Hussein Kadhum1, Alaa Hamzah Abdullah 1
doi	
Abstract	Recently, researchers have focused their efforts to generate electricity on renewable energy sources. Such as wind power systems, which are considered good alternative sources of clean energy. Induction generators are the best choice for generating this energy due to their simplicity, robustness, and low maintenance requirements. However, their main drawbacks are their need for leading reactive power to build the terminal voltage and generate electrical power. This drawback can be overcome by using a terminal capacitor across the generator terminals to generate this leading reactive power. This research focuses on: 1-Provides a methodology for selecting the a accurate and reliable value of the excitation capacitance required for self-excited induction generators(SEIG), which can be used in pumps operate as turbines (PATs + SEIG). When operating at different speeds and loads. For these systems, the choice of capacitance for the SEIG is of utmost importance. 2- A simplified and understandable method derived from nodal analysis is presented for calculating the exact excitation capacitance of a self-excited induction generator (SEIG) under various conditions. 3-A new analysis and model of (SEIG) is presented. The proposed model consists of an induction generator, a self-excited capacitor and a RL load. It is used to study the performance of SEIG under different faults and excitation (sudden short circuit, unbalanced excitation, sudden load surge, sudden disconnection of excitation capacitance and load disturbance). Simulations are created using MATLAB-SIMULINK to validate the proposed model.

No.	5
Title	Developing a hybrid Ant-Wolf algorithm to conserve energy in clustered wireless sensor networks
Authors	Aqeel K. Kadhim *1, Shahad A. Kamil 1, Jolan R. Naif 2, Haider K. Hoomod 3, Mokhalad Alghrairi 1, Nasri Sulaiman 4
doi	
Abstract	One of the critical challenges in wireless sensor networks is to maintain the continuity of energy for the entire network in an effort to prolong network lifetime. In this research study, we propose a promising approach that combines the Gray Wolf optimization (GWO) Algorithm for clustering and Ant Colony Optimization (ACO) algorithm for routing, to optimize energy consumption in clustered wireless sensor networks. The hopeful cluster-based routing protocol which has been named the hybrid Ant-Wolf algorithm (HAWA) aims to enhance network performance by effectively managing clustering and routing tasks. This hybrid approach target, is to maximize energy efficiency, prolong network lifetime and improve data delivery in WSNs, making it an encouraging solution for practical implementations and research advancements in the field. This protocol contributes to the development of one of the effective techniques for saving energy during the design and operation of wireless sensor networks. According to the practical results obtained, in general the suggested protocol will combine the strengths of both meta-heuristic algorithms for different aspects of network optimization. To demonstrate the effectiveness of the proposed protocol, the HAWA protocol was compared with three well-known routing protocols: LEACH, Z-SEP, and DEEC according to the simulation results the proposed protocol better than other methods in important metrics that have a vital impact in preserving network energy for the longest possible period, prolong the life-time of network, and upgrading network stability

No.	6
Title	Electro-Optical Modulators: Novel Material Challenges and Opportunities
Authors	Haneen M. Zaki 1*, Qais Al-Gayem1, Haider J. Abd2
doi	
Abstract	The increasing demand for high-speed, ultra-compact photonic devices has motivated the search for materials with superior electro-optic properties. Traditional silicon-based modulators, while widely used, face significant limitations in terms of performance and integration. Transparent conducting oxides (TCOs), especially indium-tin-oxide (ITO), present a promising solution due to their superior electrical conductivity, optical transparency, and epsilon-near-zero (ENZ) permittivity. These advantages make ITO an ideal choice for next-generation electro-optic modulators. This paper reviews the state-of-the-art in ITO-based electro-optic modulators, focusing on their ability to achieve high extinction ratios (ER) and low insertion losses (IL). The paper analyzes various designs and configurations of ITO modulators, evaluating their performance and comparing them with conventional silicon modulators. The paper highlights the significant advantages of ITO, including enhanced modulation efficiency and reduced device footprint. The paper concluded that ITO-based modulators not only address and solve the inherent challenges of silicon photonics but also pave the way for the development of more efficient and compact optoelectronic devices for future applications.

No.	7
Title	Reconfigurable Miniaturized Multi-Band Antenna Based On Metamaterials For Iot Applications
Authors	Abdullah Hasan Ali*1 and Jamal Mohammed Rasool1
doi	
Abstract	This study proposes a novel small-print antenna for Internet of Things (IoT) application devices with promising wireless communication technologies. Initially, The antenna is designed to operate at three different frequencies (2.96, 3.25, and 3.72 GHz). after integrating 4 x 5 Quadrilateral Stepped Square Slot (QSSS) metamaterials into the substrate. In three modes, the antenna can reconfigure its pentaband frequencies: 3.4-4.2 GHz in mode 1, 2.39-2.6 GHz and 3.94-4.91 GHz in mode 2, and 2.74-3.15 GHz and 4.39-5.27 GHz in mode 3. The design is built on a commercially available FR-4 substrate with a relative permittivity (εr) of 4.3 and a tangent loss ($\tan(\delta)$) of 0.025, featuring a compact size of (20 x 14 x 1.4) mm³. We enhanced the bandwidth by using a partial ground plane. The antenna radiator integrates a single PIN diode (SMP1340-079LF) with a complete biasing circuit to achieve reconfigurability. The proposed antenna is ideal for wireless communication applications, thanks to its manufacturability, improved bandwidth, and low return loss. Widely used frequency ranges, including Wi-Fi, Bluetooth, and ISM bands, can accommodate its use. The results demonstrate that metamaterials increase operating frequencies

No.	8
Title	Concatenated RS/Hamming code in the f-OFDM system
Authors	Ghada Abood Jassim*1, Ghasan Ali Hussain1
doi	
Abstract	The advent of 5G technology necessitates the development of networks that are faster and more reliable, highlighting the limitations of 4G data transmission methods. Orthogonal Frequency Division Multiplexing (OFDM) is a standard in LTE systems but encounters challenges in 5G, such as high Out-Of-Band Emission (OOBE) and Peak-to-Average Power Ratio (PAPR). To mitigate these issues, filtered OFDM (f-OFDM) has been proposed for 5G wireless communication systems. It is essential to balance minimizing OOBE, reducing Bit Error Rate (BER), and managing PAPR levels. This paper aims to explore these trade-offs and develop a system with enhanced efficiency and reliability. The proposed strategy involves using concatenated RS-Hamming codes in f-OFDM to improve performance. This method combines an outer Reed-Solomon (RS) code with an inner Hamming code and an interleaver to randomize burst errors and assist the RS code in error correction. The RS (7, 1) outer code enhances reliability and compatibility with the Hamming (7, 4) inner code. Additionally, a windowed Finite Impulse Response (FIR) filter is integrated into the f-OFDM architecture to reduce OOBE levels. The results indicate that the f-OFDM system using FIR digital filtering significantly lowers OOBE values compared to traditional OFDM. Moreover, the concatenated RS/Hamming code system improves the BER performance of the f-OFDM system. Additionally, the proposed system effectively reduces the PAPR, maintaining it at low levels. The use of an interleaver notably enhances BER performance when combined with concatenated codes, further improving the system's overall efficiency and reliability

Consequently, the proposed system emerges as a strong contender for 5G, offering improved efficiency and reliability. |

Mesopotamian Journal of Cybersecurity

No.	9
Title	Design and Practical Implementation of Stream Cipher Algorithm Based on Lorenz System
Authors	Hayder Mazin Makki Alibraheemi 1* , Mazen M. A. Al Ibraheemi 1 , Zainb Hassan Radhy
Doi	https://doi.org/10.58496/MJCS/2024/019.
Abstract	The design and implementation of cryptography system based on Lorenz chaos oscillator is presented in this paper. The chaotic system implementation has been carried out using Field Programmable Gate Array (FPGA) technology with Xilinx System Generator (XSG). The differential equations of the Lorenz chaotic system are solved using Forward-Euler and Runge-Kutta integration methods in order to figure out the method that consumes small amount of the FPGA resources with efficient and effective performance. The differential equations solution is used to build the secure communication system in the XSG environment. The designed communication system is then implemented inside the FPGA board and tested for image (colored) encryption purposes. The histogram, entropy and other related security analysis factors are calculated and analyzed to test the efficiency of the designed system. The simulation and FPGA results are in good agreement, in the other hand the security analyzing factors proof that the system successfully can be adopted for image encryption purposes.

No.	10
Title	Hybrid classifier for detecting zero-day attacks on IoT networks
Authors	Rana M.Zaki1,*, Inam S.Naser1
doi	https://doi.org/10.58496/MJCS/2024/016
Abstract	Cyber threats and attacks target Internet and IoT networks and exploit existing vulnerabilities. One of these attacks is a zero-day distributed denial-of-service (DDOS) attack. It is considered one of the dangerous attacks that target network security and exploit unintended vulnerabilities in the targeted networks. It requires finding smart solutions to deal with these attacks with the development taking place in the use of the Internet. Among the smart solutions are well-trained intrusion detection systems to reduce these attacks and protect networks. These systems rely on machine learning to train them. Machine learning techniques are very good at training systems in zero-day detection and finding vulnerabilities by analyzing very large amounts of data and identifying all patterns of attacks. In this research, a hybrid model for intrusion detection will be proposed that relies on machine learning algorithms to train the proposed model. The data was analyzed and the necessary features were selected to train the model using random projection. In the proposed model, machine learning algorithms were used (XGBoost Classifier, KNeighbors Classifier and SGD Classifier) and the classifiers were combined using Ensemble Machine Learning. And finding the best hyper parameters for each classifier and each classification stage through Grid search (CV). To get a good prediction. In the stage of evaluating and testing the model's performance, two cybersecurity datasets (CIC-IDS2017 and CIC-DDoS2019) were used to test the model's efficiency in detecting zero-day threats. In the CIC-IDS2017 dataset, the data was processed, and the best 25 features were selected. A model accuracy of 99.90%, a detection rate of 99.77%, the intrusion detection time was 0.27s. In the second dataset (CIC-DDoS2019), 20 features were used out of the total features, and the model was able to obtain an accuracy of 99.91%, the intrusion detection time was 0.22s.

No.	11
Title	A Systematic Literature Review on Cyber-attacks Detection in Software-Define Networking (SDN)
Authors	Dalia Shihab Ahmed1*, Abbas Abdulazeez Abdulhameed 2, Methaq T. Gaata
doi	https://doi.org/10.58496/MJCS/2024/018
Abstract	This systematic literature review provides a comprehensive analysis of cyber-attack detection in Software-Defined Networking (SDN). Traditional network security appliances face limitations in complexity and management, making SDN an attractive alternative. SDN separates the control plane from the data plane, enabling centralized management and flexibility. The paper thoroughly examines various techniques for detecting cyber-attacks, discussing their strengths, weaknesses, and gaps. Emphasis is placed on the importance of creating SDN-specific datasets and utilizing feature selection algorithms. Overall, this review offers valuable insights into the current state-of-the-art in cyber-attack detection in SDN and provides a roadmap for future research in this critical field.

The review delves into the background of SDN architecture, categorizes attacks against SDN control planes, analyzes datasets used for cyber-attack detection, discusses feature selection techniques, and evaluates detection approaches such as entropy, machine learning (ML), deep learning (DL), and federated learning (FL). The paper also examines the metrics used for evaluating defense mechanisms against cyber-attacks and presents a roadmap for future research in SDN cyber-attack detection. By addressing research questions related to existing techniques, types of attacks, strengths and weaknesses of methodologies, evaluation metrics, datasets, and significant gaps in SDN-specific datasets and the need for advanced feature selection algorithms, suggesting future research should focus on these areas. |

Journal of Al-Qadisiyah for Computer Science and Mathematics

No.	12
Title	Efficient Face Mask Detection Using Hybrid Deep Learning Algorithms
Authors	Mohammed AL-ABBASI , Tamarah Kareem , Salam Waley Shneenc
doi	https://jqcsm.qu.edu.iq/index.php/journalcm/article/view/1770
Abstract	The coronavirus COVID-19 pandemic has caused a global health crisis. According to According to the World Health Assembly, one of the best preventative measures is to wear a face mask while out outdoors (WHO). This work presents a hybrid model for face mask identification that combines deep and traditional machine learning. I have trained the proposed system, which consists of convolutional neural networks (ConNN), support vector machines (SVM), and random forests (RF), in three stages, the first stage, used ConNN, the second stage, used the same ConNN with the SVM method, and in the third stage, used ConNN and RF. This paper suggests three different kinds of masked face recognition datasets: the Incorrectly Masked Face Dataset (IMFD), the Correctly Masked Face Dataset (CMFD), and the combination for MaskedFace-Net, a worldwide masked face detection system. Two objectives are presented for the realistic masked face datasets: i) to identify individuals whose faces are covered or not covered, ii) to identify faces whose masks are put on properly or improperly (for example, at airport entrances or among crowds). The suggested model is made up of two parts. The first part is designed for feature extraction using a convolutional neural networks. In contrast, the second section is made to classify face masks using SVM and RF methods. The ConNN achieved 99.92%. and achieved for ConNN and SVM 99.94%. ConNN and RF 98.79%. Moreover,The system has been tested in real world scenarios and can recognize and classify any image selected by Google with high accuracy. we a comparison and the results aim to evaluate the proposed model.

No.	13
Title	Implementation of Li-Fi Technology in Smart Home Systems: Development and Analysis of a Prototype for Enhanced Wireless Communication
Authors	Ali Fadhel Athab
doi	https://jqcsm.qu.edu.iq/index.php/journalcm/article/view/1771
Abstract	Exploring innovative communication technologies has been a pressing need due to the need for reliable and efficient data transmission in networks such as industrial automation, IoT devices, and healthcare systems. This research investigates a wireless communication system that uses visible light, called microcontrollers, with Li-Fi technology instead of radio waves to enhance data accuracy and resilience. Unlike traditional legacy systems, Li-Fi technology provides a buffer against electromagnetic interference, making it a promising alternative for smart home automation. This research includes a developed prototype that uses visible light communication (VLC) through LEDs and an LDR receiver, controlled by an Arduino microcontroller. The KNX standard was adopted in building the proposed system, which has been widely adopted in building automation. The results showed that the Li-Fi-based system improves the accuracy of data transmission as well as the data transmission power. This research, along with other researches on Li-Fi, contributes by demonstrating its applicability in smart home environments, and thus this technology will revolutionize wireless communications across various fields.

No.	14
Title	Dsigning system for observation of real-time patients via ICT In Health Institutions of Iraq
Authors	Satar Habib Mnaathr,,.Aqeel Ahmed Abed,. Muhammed fadhil abduladeemc
doi	https://doi.org/10.29304/jqcsm.2024.16.41774
Abstract	ICT is becoming more and more popular in the field of remote control. In the healthcare system, patients are monitored in an intensive care unit after a surgical p rocedure until they are physically stable, then moved to a room for evaluation and recovery. Usually, ward evaluation does not imply continuous monitoring of physiological parameters, and therefore patient relapse is not uncommon. This paper describes the steps taken to design and build a prototype for a low-cost, modular monitoring system. This system is intended to provide mobile support to facilitate faster and better medical interventions in emergencies and has been developed using dedicated low-power sensor arrays for BPM, SpO2, and temperature, as well as room temperature and humidity. The interfaces for these sensors are developed according to the IoT model: the central console displays a web interface based on a REST API that ensures platform-neutral behavior and provides a flexible mechanism for integrating new components. Finally, this paper also investigates the technologies and systems related to e-health services with a better understanding of monitoring applications based on multiple models and different IoT sensors. Finally, this study contributes to scientific knowledge by identifying the main challenges of the topic and providing possible opportunities in this research area.

No.	15
Title	Enhancing Efficiency and Sustainability in the Electric Power Industry with (IoT)
Authors	Fatima M. Abd-alrasool
doi	https://doi.org/10.29304/jqcsm.2024.16.41773
Abstract	The Internet of Things (IoT) has brought about a new age in the electric power sector, allowing better processing, safety, and price management. IoT systems work via the supply chain to transport, check, and share the collected data. They get the data that will help to make the right decisions from different sources, and then they further process and interpret it. By this, the decision-making skills are improved. Internet of Things is about collecting, organizing, and exchanging data in different locations and across platforms. It's a technology that shortcuts our metros but by real-iconic monitoring and self-detecting we are sure to receive power on time and when faults occur it addresses them immediately. IoT setup has given rise to Smart Grids, which are hi-tech, self-regulated communication networks employing processes like artificial intelligence and deep learning that enable quality, energy, usage regulation and real-time grid repairs and security.

No.	16
Title	An Improved Image Generation Conditioned on Text Using Stable Diffusion Model
Authors	Sara Faez Abdylgahni, Aahwan Anwer Abdulmunem
doi	https://doi.org/10.29304/jqcsm.2024.16.41772
	One technique for creating visuals that correspond to textual descriptions is called "text-to-image generation." It affects a wide range of applications and research fields (e.g., photo-editing, photo-searching, art-making, computer-aided design, image reconstruction, captioning, and portrait drawing). With the development of text-to-image generation models, artificial intelligence (AI) has reached a turning point where robots are now able to convert human language into aesthetically beautiful and coherent images, creating new opportunities for creativity and innovation. The creation of stable diffusion models is one of this field's most noteworthy developments. These models provide a strong framework for producing realistic images that are semantically linked with the given textual descriptions. But even with their remarkable abilities, conventional text-to-image models frequently have serious shortcomings, especially when it comes to training timeframes and computing costs. These models can be costly and time-consuming to train because they usually need large amounts of processing power and long training times. The main goal of this work is to develop a better Stable Diffusion model to overcome these shortcomings and produce high-quality images from text. The suggested model will drastically cut down on training durations and processing needs without sacrificing the quality of the output photos. The proposed method shows that the fine-tuning of the Stable Diffusion model results in a considerable improvement in producing images that are more akin to the original. The results of the improved model denoted a lower FID score (212.52) when contrasted with the base model (251.22).

No.	17
Title	Performance Analysis for RC6 and PRESENT Encryption Algorithms in Cloud Environment
Authors	Doaa S. Salman, Huda H. Ali
doi	https://jqcsm.qu.edu.iq/index.php/journalcm/article/view/1775
abstract	Organizations and individuals increasingly rely on cloud services for data storage and transmission, and the need for robust and efficient encryption algorithms is more critical than ever. This paper rigorously examines the performance and NIST compliance of two lightweight encryption algorithms, RC6 and PRESENT, within cloud computing contexts. The paper assesses the algorithms' performance metrics, such as encryption time, decryption time, space-time, memory used, CPU consumption, avalanche effect, entropy, and energy consumption, in addition to their security features. Also, utilizing fifteen NIST SP 800-22 cryptographic tests to ensure secure and efficient practices, including recent security analyses to assess the two algorithms' behavior, both algorithms present a distinct array of compromises between effectiveness and protection. The results function as a strong regulator for the decision-making process in cloud security, offering advantages to both professionals in the field and experts in cryptography, it shows RC6 outperforms PRESENT in encryption (5.334s vs. 6.937s), decryption (6.035s vs. 6.191s), and space-time efficiency (1189 bytes/s vs. 41 bytes/s). While PRESENT uses less memory after encryption (41.27 MB vs. 67.63 MB), RC6 has slightly lower CPU consumption (4.50% vs. 4.90% for encryption) and higher energy efficiency (0.901J vs. 0.956J). Deep analysis is implemented to balance security and efficiency, and after implementing the two algorithms to encrypt the same file the result of the analysis was, that RC6 stands out as a particularly strong contender. It offers robust security features and is more efficient in terms of computational time, resource utilization, and energy consumption. PRESENT, while secure, tends to consume more resources and takes longer for encryption and decryption. However, its simpler design might offer some advantages in certain scenarios, though this comes with trade-offs in performance and resource efficiency.

No.	18
Title	Securing ML Models: A Systematic Survey of Poisoning Attacks and Defense Mechanisms
Authors	Mahdi Nsaif Jasim, Hanan Abed Alwally Abed Allah
doi	https://jqcsm.qu.edu.iq/index.php/journalcm/article/view/1776
Abstract	In recent years, Machine Learning (ML) has brought about a significant revolution in several fields such as medicine, justice, cybersecurity, and other vital fields that require intelligent and urgent decision-making. With this development, a type of adversarial attack targeting ML models called a Poisoning Attack (PA) has emerged. One realistic attack scenario is for an adversary to subtly update samples or reverse some labels of training data, causing degradation to the model's overall accuracy during the testing phase. To gain a deeper understanding of this scenario, a survey will be conducted about the attack and how it is carried out against different models. In addition to the protection techniques to identify their weaknesses. Finally, some solutions will be proposed to maintain the availability, robustness, and integrity of ML models.

Mustansiriyah Journal of Pure and Applied Sciences

No.	19
Title	Applications of KKAT Transform Technique in Convolution Kind Linear Volterra Operator Equations
Authors	Emad A. Kuffi ,Ahmed Mahdi Abbood,
doi	https://doi.org/10.47831/mjpas.v3i1.318,
Abstract	Due to the importance of integral equations in engineering and scientific applications, there are many papers that have solved integral equations of both linear and nonlinear types. In this paper, Karry-Kalim Adnan transform (KKAT) is utilized to find the solution of convolution kind linear Volterra equations of the first and second kind. Examples are Aroffered to illustrate the Karry-Kalim Adnan technique for solving convolution kind Volterra operator equations. It was noted that this technique is much easier in terms of mathematical operations and simplicity in arriving at the exact solution and this is explained through the applications in the paper.

No.	20
Title	Security surveillance systems based on deep learning and Blockchain techniques: a review
Authors	Maysam Majid Sabri , Haider Kadhim Hoommod , Khalid Ali Hussein
doi	https://mjpas.uomustansiriyah.edu.iq/index.php/mjpas/article/view/326
Abstract	A building security surveillance system typically refers to a comprehensive setup designed to monitor and enhance security within a specific building. This system typically integrates various technologies and components to detect, assess, and respond to potential security threats. The ability of deep learning systems to draw informed conclusions has made them very popular in the field of security monitoring systems. However, centralized servers in many current deep learning systems prevent providing essential features such as verified data provenance, operational transparency, traceability, and reliability. On the other side, `blockchain` technology is a distributed and decentralized digital system composed of a series of blocks that include encrypted transaction data that can be shared among network users. Therefore, the integration of deep learning and blockchain technologies into security surveillance systems is an important area that provides improvements in data analysis, privacy, security, and overall efficiency of surveillance systems. This article reviews the significance of integrating deep learning algorithms and blockchain technology to develop a building security monitoring system. Furthermore, research related to integrating deep learning techniques with blockchain technology will be presented. Therefore, topics such as deep convolutional neural networks, blockchain concepts, and the measurements used to link these two technologies will be investigated and discussed. Finally, we present a comprehensive discussion of the state-of-the-art articles that must be investigated for building a robust deep learning system based on blockchain technology for security monitoring systems.

No.	21
Title	Leveraging hybrid database models for enhanced gene-disease association analysis
Authors	Sama Salam Samaan, Saja Dheyaa Khudhur , Omar Nowfal Mohammed Taher
doi	https://mjpas.uomustansiriyah.edu.iq/index.php/mjpas/article/view/325
Abstract	Many diseases are driven by genetic variations. The Gene-Disease Association (GDA) dataset, structured as a network, evaluates the relationships between genes and diseases. Typically, the GDA dataset consists of semi-structured data, which does not conform to a tabular format. In this work, we propose a hybrid approach for processing, storing, and analyzing TBGA, a GDA dataset comprising over 200,000 JSON instances and 100,000 gene-disease pairs. We introduce two procedures to import the TBGA dataset into both a relational model and a graph model. SQL Server is employed for the relational model to support analytical and reporting tasks, while Neo4j is used for the graph model to enable visualization and the application of graph algorithms tailored for GDA analysis. Experimental results demonstrate the effectiveness of each model, with SQL Server excelling in analytical tasks and Neo4j in visualization and graph analysis.

No.	22
Title	Secure E-voting authentication system employing biometric technology, Crypto-Watermarking Approach and blockchain technology: A Review
Authors	Asia Abdullah Ahmed, Nada Hussein M. Ali
doi	https://doi.org/10.47831/mjpas.v3i2.324
Abstract	Moderately, advanced national election technologies have improved political systems. As electronic voting (e-voting) systems advance, security threats like impersonation, ballot tampering, and result manipulation increase. These challenges are addressed through a review covering biometric authentication, watermarking, and blockchain technologies, each of which plays a crucial role in improving the security of e-voting systems. More precisely, the biometric authentication is being examined due to its ability in identify the voters and reducing the risks of impersonation. The study also explores the blockchain technology to decentralize the elections, enhance the transparency and ensure the prevention of any unauthorized alteration or manipulation of the results. Additionally, the watermarking technology is examined for viewing the ability to store and transmit the voting result in secure manner though preserving the confidentiality ensure fair elections. this review contribution is the combination evaluating of biometric authentication, watermarking, and blockchain technologies effectiveness to develop robust e-voting framework. as a result, the key finding indicates a hybrid approach that integrates those technology offers a solution to address the security challenges.

| Abstract | This study investigates the use of advanced machine learning algorithms to classify different classes of epilepsy EEG signals. Using the Time Series Feature Extraction on basis of Scalable Hypothesis tests (TSFRESH) package, a large set of features was reduced to the most important ones by extracting them from the University of Bonn EEG dataset. Following that, seven distinct machine learning classifiers were trained using these features. Three different classification tasks are used to evaluate the classifiers using cross validation. The evaluation results of each algorithm after testing them on each of the three tasks show that the accuracy of the Support Vector Machine (SVM) reaches 99.60% for binary classification, the accuracy of Histogram-based Gradient Boosting Trees (HGBT) reaches 99.20% for the three-class task, and for the five-class classification, the Random Forest achieves 94.80% accuracy, which is the highest among the others. These results show that there is no dominant algorithm that works for all classification tasks and it is necessary to always run more than one algorithm to get a better assessment. |

No.	24
Title	Analysing Boost Converter Circuit by Using State Variables Methodology
Authors	Tamarah A.Kareem, Mohammed AL-ABBASI, Mayada T.Wazi
doi	https://doi.org/10.18421/SAR74-06
Abstract	This paper has studied one of the fundamental DC-DC converter circuits, the boost circuit, which is analyzed using the state variables method. Ideal switch concepts are used to model semiconductor devices. Circuit topologies are established based on an examination of the converter circuit's operating states. For every topological state, state equations are obtained. The resultant equations are solved numerically in a stable manner using the Backward Euler approach.For circuit simulation, the Matlab environment is used to execute all of the results.

No.	25
Title	A Computer Modeling Characteristics of Brushless DC Motors in Medical Application
Authors	Basim Abdulkareem Farhan, Amir. M. Khalaf, Tarik R. Al-Khateeb
doi	https://doi.org/10.18421/SAR74-10
Abstract	This work presents a modelling process for Brushless DC motors (BLDCMs) that considers both magnetic saturation and reluctance variation. DC motors are employed in diagnostic equipment like blood analysers and centrifuges. They enable the rotation and mixing of samples, facilitating the analysis of blood, urine, and other biological substances. Dental Tools: DC motors power dental equipment such as dental drills and handpieces. There are two classes of Brushless DC motors were introduced for modelling using MATLAB Simulation that involved reluctance variation: The non-uniform air gap model and the uniform air gap model. The characteristics of torque-speed for the two models are studied and compared. Non-uniform air gap mathematical model after that is adopted for the purpose of studying effect of magnetic saturation.When magnetic saturation is incorporated in this work, some constant parameters in the models developed are transformed into variables that are dependent upon current variation.