



*International Conference on Computer
Science & Information Technology*

المؤتمر الدولي لعلوم الحاسوب وتكنولوجيا المعلومات

**International Conference on Computer
Science & Information Technology**

**18 September
Iraq-Karbala**

المنظمون
كلية الامام الاعظم الجامعة / قسم علوم الحاسبات
جامعة واسط / كلية علوم الحاسوب
وزارة الشباب والرياضة / دائرة الرعاية العلمية
مركز التميز / جامعة يونيماب - ماليزيا

Table of Contents

TABLE OF CONTENTS.....	ii
عن المؤتمر	1
رسالة المؤتمر	1
اهداف المؤتمر.....	1
موضوعات المؤتمر.....	2
جدول الاعمال	3
KEYNOTE SPEAKERS	15
TRACK 1: ARTIFICIAL INTELLIGENT HEALTHCARE.....	17
TRACK 2: SECURITY	30
TRACK 3: IOT , MOBILE APPLICATION, IMAGE PROCESS	40
اللجان :.....	52

عن المؤتمر

المؤتمر الدولي المتقدم في علوم الحاسوب وتكنولوجيا المعلومات (ICCSIT2024) الذي تنظمه كلية الامام الأعظم الجامعة/قسم علوم الحاسبات وجامعة واسط / كلية علوم الحاسوب وتقنية المعلومات ووزارة الشباب والرياضة دائرة الرعاية العلمية ومركز التميز جامعة الينيماب.

للمدة من 18-20 ايلول 2024 في العتبة الحسينية في كربلاء. يخصص المؤتمر الدولي لعلوم الحاسوب وتكنولوجيا المعلومات للاتجاهات الناشئة في مجال الحوسبة وتحليلات البيانات، حيث يجمع الخبراء والعلماء ومحترفي الصناعة من جميع أنحاء العالم. وهو المنصة المناسبة التي تسمح للباحثين الوطنيين والدوليين بتبادل أحدث المعلومات التقنية، ونشر نتائج البحوث عالية الجودة، وعرض التطورات الجديدة، ومناقشة وتشكيل التقنيات المستقبلية.

رسالة المؤتمر

تقديم منصة متميزة لجمع المبتكرين والمهتمين بالعلوم والتكنولوجيا، لتبادل الأفكار والمعرفة والتعاون على تطوير حلول مبتكرة تسهم في تمكين المجتمع وتحقيق التقدم العلمي والتكنولوجي".

اهداف المؤتمر

- تعزيز التواصل والتفاعل بين الباحثين والمهنيين في مجالات العلوم والتكنولوجيا.
- تعزيز التبادل المعرفي والابتكار والتعلم المستمر في مجالات العلوم والتكنولوجيا.
- دعم التطور التقني والعلمي من خلال عرض الأبحاث والتقنيات والحلول الابتكارية.
- توفير فرص لبناء شبكات العلاقات الاجتماعية والمهنية بين المشاركين.
- توفير منصة لتبادل المعرفة والابتكار في مجالات العلوم والتكنولوجيا، بهدف تعزيز التعاون والتفاعل بين الباحثين والمهنيين في هذه الحقول، وتعزيز التطورات

والتقنيات الحديثة التي تسهم في تطوير المجتمع وتحقيق التقدم العلمي والتكنولوجي

موضوعات المؤتمر

1. الذكاء الاصطناعي
2. انترنت الأشياء
3. الرعاية الصحية والمعلوماتية الحيوية
4. الحوسبة السحابية
5. الأمن السيبراني
6. علوم البيانات

All accepted and presented papers is expected to be published in one of the following journals.

- Journal of Advanced Research in Applied Sciences and Engineering Technology, Scopus Rank: Q2
- Cybernetics and Information Technologies, Scopus Rank: Q3
- Pertanika Proceeding, Scopus Rank: Q3.

جدول اعمال المؤتمر الدولي لعلوم الحاسوب وتكنولوجيا المعلومات (18 ايلول 2024)

الجلسة الصباحية قاعة سيد الاوصياء	8:30-9:30	Registration	التسجيل
	9:30-9:45	Opening recitation from the Holy Quran and the national anthem	الافتتاح تلاوة من القران الكريم والسلام الجمهوري
	9:45-10:15	1 -Welcome speech from the General Secretariat of the Holy Imam Hussein Shrine -2 Speech of Dean of Alimam Aladham University College 3-Speech Dean of the College of Computer Science and Information Technology 4-Speech by the Director General of the Scientific Care Department	كلمة السيد 1-الأمانة العامة للعتبة الحسينية المقدسة 2- السيد عميد كلية الامام الاعظم 3-عميد كلية علوم الحاسوب وتكنولوجيا المعلومات 4-كلمة السيد مدير عام دائرة الرعاية العلمية
	10:15-10:45	Keynote speaker A.P.Dr Dia Aljumaily	ألبرفسور ضياء الجميلي مستشار رئيس الوزراء لشؤون العلمية والذكاء الاصطناعي
	10:45-11:15	Keynote speaker A.P Dr. Phaklen Ekhan	المتحدثون (اونلاين)، أ.د باكلن اي خان / مركز التميز /جامعة يونيماب

	11:15-12:20	Coffee break	كوفي بريك
الجلسة الصباحية قاعة سيد الاوصياء		First session	الجلسة الاولى
	12:20-1:20	Artificial intelligent	<p>الجلسة الاولى (الذكاء الاصطناعي) رئيس الجلسة : أ.م.د عبدالهادي محمد ادخيل مقرر الجلسة : أ.م.د زهراء عدنان عبدالكريم</p> <ol style="list-style-type: none"> Integrating PSO with Butterfly Optimization for Efficient Feature Selection: An IBFPSO Approach (Ali Abdalkareem & Manar Alkoran). Grad Guide : Intelligent Application to Assist 6th Grade Students in Filling Out Iraqi Universities Application Form (Heba Fadhil, Abdullah Jamal and Suhaib Safaa) An Optimize Canny Algorithm with Traditional Machine Learning for Edge Detection Enhancement. (Russel Kareem and Zainab Sultani) The Challenges of Artificial Intelligence and Deep Learning with Arabic Grammar (Nahw). (Imad Farhan and Saadi Sharq)
	1:20-2:20	Lunch break	استراحة الغداء

Conference Agenda

	2:20-3:15	Workshop HealthLink: Transforming healthcare services in Iraq with AI and Telemedicine	أ.م.د عمر حسين سلمان (تحويل خدمات الرعاية الصحية في العراق باستخدام الذكاء الاصطناعي والطب عن بعد)
٢٠٢٤		Second Session	الجلسة الثانية

	5:00-6:00	Cyber security	<p>الامن السيبراني رئيس الجلسة : أ.م.د علي فاهم نعمه مقرر الجلسة : م.د ندى قاسم محمد</p> <ol style="list-style-type: none"> 1. Predicting Fraud: A Machine Learning Approach to Secure Transactions in Credit Card System (Bashar Hameed, Mohammed Mohammed and Humam Yaseen) 2. PhishNetVAE: An Integrated Variational Autoencoder and Deep Neural Network Approach for Enhancing Cybersecurity Strategies by Detecting Phishing Attacks (Esraa Hameed Kamel, Mohammed Ibrahim Mahdi, Ali Fahem Neamah, Riyadh Rahef Nuiaa, Saif Ali Abd Alradha Alsaïdi, Ali Hakem Alsaïdi and Selvakumar Manickam) 3. Effective En coding systems based on address for mobile networks security (Mustafa Yaseen and Waleed Khalid Ahmed) 4. Adaptive Hybrid Deep Learning Model for Real Time
--	-----------	----------------	--

Conference Agenda

		<p>Anomaly Detection in IoT Networks (Esraa Saleh Alomari, Selvakumar Manickam and Mohammed Anbar)</p> <p>5. Fortifying Wireless Sensor Networks: Machine Learning Empowered Intrusion Detection for Enhanced security (Ali Mohammed, Hasanain Altareehee and AqeelAlmahmodi)</p>
6:00-6:45	Coffee break	كوفي بريك
06:30 – 08:00	Third Session	الجلسة الثالثة
6:45-7:30	Cloud computing	<p>الحوسبة السحابية وانترنت الاشياء والرعاية الصحية رئيس الجلسة : أ.م.د مصطفى عبدالغفور محمد مقرر الجلسة : م.د احمد رعد عبدالحسين</p> <p>1. Sustainable leaf plant disease based on Salp Swarm algorithm Feature Selection (Hamsa E. Mahmood, Yossra H. Ali and Tarik A.Rashed)</p> <p>2. A System for Monitoring Chronic Disease Patients in Nursing Homes Using Machine Learning Techniques (Ammar Al Mousawi and Mali Alameady)</p>

		<p>3. Multi-Camera Surveillance System for Violence Prediction Estimation: A Review (Sara Ayad and Yarub Alazzawi)</p> <p>4. Real Time Hospital Selection Framework for Multi Chronic Disease Patients in Telemedicine System: Towards More Personalize Healthcare Services (Noor F. Abbas, Omar H. Salman ,Abdulrahman A. Jasim)</p>
7:30-8:30	Closing ceremony Certificate collection	<p>التوصيات أ.د. زياد حسين صالح /رئيس اللجنة العلمية حفل الختام وتوزيع الشهادات</p>



Track 1: Artificial intelligent Healthcare

No	Authors	Titles
1.	Techniques Of Attribution In Cyberspace Based On Using Artificial Intelligence	Alaa Hussein Al-Hamami and Zeki Saeed Tawfik
2.	Ighatha : A mobile application for medical emergency management during religious events in Iraq	Muhammed Jalal and Heba Fadhil
3.	Integrating PSO with Butterfly Optimization for Efficient Feature Selection: An IBFPSO Approach	Ali Abdulkadhim and Manar Alkorani.
4.	Automated Detection and Classification of Retinopathy of Prematurity Stages using SWIN Transformer	Nazar Salih, Mais A. Al-Sharqi, Aws Saad and Nebras Hussein
5.	LEVERAGING MACHINE LEARNING FOR ACCURATE OUTPATIENT CLASSIFICATION IN DIVERSE MEDICAL DATASETS	Zahraa A. Abdalkareem, Aws Saad Shawkat, Ali Fahem Neamah, Omar H. Salman, Maan Nawaf Abbod, Mustafa A. Mohamed, Amiza Amir and Nada Q. Mohamed
6.	Analytical Study on Emerging Trends in Cardiomyopathy Detection through Diverse Database Classification	Bushra Kamil and Ebtesam Alshemmary
7.	Exploring Pruning and Quantization Techniques for Deep Transfer Learning Models for Diabetic Retinopathy disease image Classification	Raghad H. Abood and Ali H. Hamad
8.	Real Time Hospital Selection Framework for Multi Chronic Disease Patients in Telemedicine System: Towards More Personalize Healthcare Services	Noor Farhan, Omar Salman and Abdulrahman Jasim
9.	Enhancing Medical Image Analysis with CNN and MobileNet: A Particle Swarm Optimization Approach	Asmaa Ghali Sabea, Maryam Jawad Kadhim, Ali Fahem Neamah and Mohammed Ibrahim Mahdi

10.	Feature Fusion for Improved Skin Cancer Diagnosis Using Support Vector Machines	Ali Fahem Neamah, Ahmad Shaker Abdalrada, Mohammed Ibrahim Mahdi Ibrahim Mahdi and Ihtiram Raza Khan
11.	Diagnosis of skin melanoma utilizing an advanced combination of improved Meta-GVF algorithms	Zaid S. Naama, Safa S. Abdul-Jabbar and Amer Almahdawi.
12.	A Hybrid Transfer- Learning Model for Classifying Ocular Diseases Using Deep Learning Networks and Machine Learning Algorithms	Walaa Abed and Ass.Prof. Dr. Ali Mohsin Aljuboori
13.	Deep Learning Approaches for Accurate Diabetic Retinopathy Detection and Classification: Comparison Study	Mohammed Ibrahim and Amir Lakizadeh.
14.	Automated Early Detection of ROP Zones Using SWIN Transformer	Nazar Salih, Mostafa Khaled, Mohammed Rashid, Nebras Hussein, Mohamed Ksantini and Amina Turki
15.	A System for Monitoring Chronic Disease Patients in Nursing Homes Using Machine Learning Techniques	Ammar Al-Mousawi and Mali Alameady.
16.	Glaucoma Disease Diagnosis-based Deep Learning Network	Rawaa Humam and Dr.Lamia Abednoor Muhammed
17.	COVID-19 in Iraq's Provinces Forecasted Using Machine Learning	Mustafa Albadri, Ammar Alzubaidi and Mohammed Al-Mukhtar.
18.	Pipeline Leak Detection Oil Based On Artificial Intelligence	Hiba Owaid Ghazzay and Mustafa J. Hayawi
19.	Arabic book semantic recommendation system based in NLP and model DEEP Learning by merge two vector models	Rasha kadhem, Souheyl Mallat and Mounir Zrigui

Track 2: Security

No	Authors	Titles
1.	Effective En-coding systems based on address for mobile networks security	Mustafa Yaseen and Waleed Khalid Ahmed
2.	Innovative Ensemble Strategies for Enhanced Intrusion Detection and Cybersecurity Defense	Hazem Salim Abdullah and Mario Maroun

Conference Agenda

3.	RVGAC: ROUND VARIABLE GENERATION AUTHENTICATION CODE BASED ON RIJNDAEL- FEISTEL BLOCK CIPHER ALGORITHM IN NETWORK SECURITY	Yousif Flaieh, Hala Albaroodi and Ahmed Ghandour
4.	Detecting DDoS Attacks using Machine Learning	Sarah Zghair Arrak and Rana Jumma Surayh Al-Janabi
5.	Darknet traffic Detection Using Hybrid Classification models in Network OS Environment	Abbas A Abdulhameed, Sundos A. Alazawi, Mostafa Abdulghafoor Mohammed and Ghassan Muslim
6.	Design and Implementation of FPGA IoT-Based Parallelized Architecture	Nada Mohammed and Badlish Ahmed
7.	Fortifying Wireless Sensor Networks: Machine Learning Empowered Intrusion	Ali Mohammed, Hasanain Altareehee and Aqeel Almahmodi
8.	Analyzing the Security Vulnerabilities of Using Fractal Images in Encryption and Hiding Information	Alaa A. Alsaffar, Qasim M. Hussein, Naji M. Suhib and Noor Q. Mohammed
9.	PhishNetVAE: An Integrated Variational Autoencoder and Deep Neural Network Approach for Enhancing Cybersecurity Strategies by Detecting Phishing Attacks	Esraa Hameed Kamel, Mohammed Ibrahim Mahdi, Ali Fahem Neamah, Riyadh Rahef Nuijaa, Saif Ali Abd Alradha Alsaiedi, Ali Hakem Alsaeedi and Selvakumar Manickam
10.	Fraud: A Machine Learning Approach to Secure Transactions in Credit Card System	Bashar Hameed, Mohammed Mohammed and Humam Yaseen
11.	Enhanced Mutual Authentication Scheme for Fog Computing Using Blockchain Technology	Saif Kareem, Bashar Hameed and Humam Yaseen
12.	Adaptive Hybrid Deep Learning Model for Real-Time Anomaly Detection in IoT Networks	Esraa Saleh Alomari, Selvakumar Manickam and Mohammed Anbar
13.	Optimizing Key Randomness in Stream Cipher Security using Particle Swarm Optimization	Omar Dawood, Hussein Almulla and Mohammed Khalaf
14.	Deep learning Based Network Intrusion Detection Using AWS Cloud	Farah Faiq and Mohammed Salih
15.	Increasing Cyber-Security in Independent Vehicles through the Integration of Verification Vector	Kholood J.Mawlood

	Machines and Defense Multiplicative Adversarial Networks	
16.	Securing Healthcare IoT Ecosystems: Anomaly Detection and Resilience Mechanisms for Enhanced Data Privacy and Trustworthiness	Kholood J. Mawlood and Oqbah Salim Atiyah
17.	Improved blockchain environment based on post quantum algorithm	Rasha Hani Salman and Hala Bahjat Abdul Wahab

Track 3: IoT , Mobile application, Image process

No	Authors	Titles
1.	A Robust Iris Localization and Texture Extraction Scheme for Iris Authentication Systems	Hayder Najm, Bahaa Kareem Mohammed, Hala A. Naman, Hussein Hussein Al Bazar, Mohammed Salih Mahdi and Wijdan Rashid Abdulhussien
2.	University of Baghdad Campus Navigation and Information Organization Mobile Application	Heba Fadhil, Mohammed Kamal and Hussam Saad
3.	Assessment of Multivariate Prediction Based on Data Fetching Methodology Using Neural Network	Raya Mahmood and Sefer Kurnaz
4.	Study and Analysis of a New Five-Dimensional Hyper-Chaotic System	Maryam Thair Alghamazi, Sadiq A.
5.	Evaluating the Efficacy of Data Clustering Algorithms: A Comprehensive Review of Performance Metrics	Yaser Mahmood and Atheer Bassel
6.	A Review on Deep Learning-based Methods for Template Matching	Mohammed Jasim A. Alkhafaji, Mohamad Mahdi Kassir and Amir Lakizadeh
7.	Perceived Factors Affecting Mobile Banking Continuance in Iraq	Walaa Hakim and Fatina Shukur.
8.	The Impact of Internet Comfort on Mobile Banking Usage Behavior in Iraq	Walaa Alnaseri and Fatina Shukur.

Conference Agenda

9.	i. Enhancing Violence Detection in Surveillance Videos Using Deep Learning Techniques	Sara Ayad and Yarub Alazzaw
10.	Multi-Camera Surveillance System for Violence Prediction Estimation: A Review	Sara Ayad and Yarub Alazzawi
11.	i. Deep_Image: Automated Identification of Bacteria based on Deep Learning Model	Wasan Maddah Alaluosi, Zainab N. Al-Qudsy, Maad M. Mijwil, Ahmed Adnan Hadi and Mohammad Aljanab
12.	Designing Green Software for the Management of Sensitive Data in Organizations	Yasmin Makki Mohialden, Nadia Mahmood Hussien, Rana Ali Abttan, Maad M. Mijwil, Mohammad Aljanabi and Mostafa Abotaleb
13.	MicroCrypt: High-Efficiency Hashing for Next-Generation IoT Devices	Shatha H. Jafer Al-Khalisy, Wafaa M. Salih Abed, Adil M. Salman, Ghada Emad Al-Kateb, Mohammed Aljanabi and Maad M. Mijwil
14.	Sustainable leaf plant disease based on Salp Swarm algorithm Feature Selection	Hamsa E. Mahmood, Yossra H. Ali and Tarik A. Rashed.
15.	Evaluation of the Economic Viability of Hybrid Solar, Wind, And Grid Connected in Somalia, Case study; Jamhuriya University of Science and Technology	Abdulaziz Ahmed Siyad, Sumayo Mohamed Ahmed, Abdinasir Mohamed Jama, Abdirahman Ali Elmi, Abdinasir Farah Yusuf, Abdillahi Mohamed Ibrahim and Yakub Hussein Mohamed.
16.	Grad Guide : Intelligent Application to Assist 6th Grade Students in Filling Out Iraqi Universities	Heba Fadhil, Abdullah Jamal and Suhaib Safaa
17.	Design an Effective Model for Plant Diseases Detection and Classification	Nedaa Jaber and Walaa Khshlan
18.	Exploring the Effectiveness of LibLINEAR Learning Technique in Multi-Class Imbalanced Data classification	Osamah Mohammed Alyasiri and Yu-N Cheah
19.	DCNN-BiLSTM approach is used to evaluate Arabic handwritten poetry responses automatically.	Huda Sabah Shuker, Raheem Abdul Sahib and Abdul Monem S. Rahma. A
20.	Integrating FaceNet and Extreme Learning Machines for Enhanced Face Identification: Addressing Real-World	Abdul Monem S.Rahma, Omar A. Dawood and Areej A. Abed.

	Challenges with Advanced Image Processing Techniques	
21.	Mitigation of Transport-Layer Based Vulnerabilities in End-to-End Encryption Group Chat Protocols	Khalid Ayed and Omar Dawood.
22.	A New Technique for Video Watermarking Which Utilizes Facial Features and Grey Wolf Optimization	Hassan Raisan Hussein, Abeer Salim Jamil and Nidaa Flaih Hassan.
23.	An Optimize Canny Algorithm with Traditional Machine Learning for Edge Detection Enhancement	Russel Kareem and Zainab Sultani
24.	The Challenges of Artificial Intelligence and Deep Learning with Arabic Grammar (Nahw)	Imad Farhan and Saadi Sharqi
25.	Intelligent Math Tutor Chatbot	Yasmin Mohialden and Ahmed Jaber
26.	A review of the role of technology in enhancing the capabilities of gifted people in youth scientific talent programs in the General Directorate of Scientific Welfare	Ahmed Saad Elewi and Zena Mohammed Faris



Keynote Speakers



Professor Dr. Dhiya Al-Jumeily

Advisor to the Prime Minister for Scientific Affairs and Artificial Intelligence



Associated professor Phaklen Ehkan

University Malaysia Perlis – Kingdom of Malaysia



Professor Dr. Veronica Gil-Costa

Universidad Nacional de San Luis (Argentina)
Large scale applications design and Modeling and Simulation

ABSTRACTS

**TRACK 1: ARTIFICIAL INTELLIGENT
HEALTHCARE**

TECHNIQUES OF ATTRIBUTION IN CYBERSPACE BASED ON USING ARTIFICIAL INTELLIGENCE

Alaa Hussein Al-Hamami (Head of Artificial Intelligence Engineering Department) and Zeki Saeed Tawfik (Head of Computer Engineering Techniques Department)

Abstract. Cyber attribution is the process of locating, identifying, and attributing blame to the person who carried out a cyberattack or other hacking attack. Cybercrimes must be held accountable in order to reduce crime rates and to ensure that the necessary degree of response is ready. The pattern has been spurred by the increasing use of internet in our daily activities and the high degree of secrecy that cyberattacks afford their perpetrators. Because of this, cybercrimes have the capacity to seriously interfere with our daily lives while preserving the identity of the perpetrator.

In order to help enterprises properly assess cyber threat attribution, this article presents a paradigm. A company's finances, credibility, compliance, and public relations can all suffer from cyberattacks. In this study, we developed a five-step approach to attribution: (1) Identifying the specific cyberattack that was utilized; (2) Identifying the cyber attack's source; (3) Target Value; (4) Target Position; (5) and (6) finally determination of the actual attacker; Attribution techniques based on Artificial Intelligence are evolving rapidly, offering more accurate, faster, and scalable methods to identify and trace cyber threats.

These techniques are crucial for enhancing cybersecurity measures and mitigating the risks posed by malicious actors in cyberspace. The Triangle Model gets its name from the fact that it determines attribution using three high-fidelity indications. The sector, tools, and methods, as well as processes (TTPs) are the triangle model's vertices. Given that it is difficult for a Threat Actor to switch tools and even more difficult to alter behavior, the Triangle Analysis Model views tools and TTPs as high-fidelity indicators.

Keywords: Attribution, Artificial intelligence, Cyberattacks, Cyberspace, Cybercrime, Threats, Actual attacker, Target Value.

IGHATHA : A MOBILE APPLICATION FOR MEDICAL EMERGENCY MANAGEMENT DURING RELIGIOUS EVENTS IN IRAQ

Muhammed Jalal (Code for Iraq , Karbala , Iraq) and Heba Fadhil (Department of Information and Communication, Al-Khwarizmi College of Engineering, University of Baghdad, Baghdad, Iraq.).

Abstract. Most religious gatherings are attended by millions of people in Iraq and for the medical practitioners on the scene, it's always a hectic moment trying to administer the required emergency treatment. Due to congestion, actions to patients may be slow since there are many people in limited space and it is difficult to find a commented patient. This important concern is central to this research, which aims at proposing and deploying a mobile application/ dashboard system to improve emergency medical intensions during such incidences. The proposed system targets three main categories of users: which are the paramedics, ambulance drivers as well as supervisors. These groups perform the tracking,

communication, and coordination in real-time using a developed mobile application and the dashboard. Some of the important functions include position monitoring of patients and medical workers using the GPS technology, messaging service for the alerts and a web-based control panel to support resource consenting for supervisors. For the assessment of the system ability and feedback data were gathered as well. The performance outcomes from the study revealed enhanced response time and communication of the medical personnel in treating the patients. Notably, the application helped to shorten the overall time needed to find and help patients, improved the dispatch system of the first available medical staff and general communication and resource management. This ability of technology is evident in the promising results of integrating advanced technological solutions into emergency management protocols for large scale schemes. The system does not only assist in enhancing the response of medical teams but has future application in similar settings across the globe. Thus, this research offers important findings about the potential of mobile technology in emergency medical services and providing grounds for further development in the field

Keywords: Mobile Application, medical Service, Real-Time Response, Location Identification, Healthcare Team Coordination, Time Optimization, Crisis Handling

PAPER ID: ICCSIT 59

INTEGRATING PSO WITH BUTTERFLY OPTIMIZATION FOR EFFICIENT FEATURE SELECTION: AN IBFPSO APPROACH

Ali Abdulkadhim (Wasit university) and Manar Alkorani (Wasit university).

Abstract. Feature selection is an effective way to decrease dataset dimensions and increase classification accuracy. But feature selection is a complex and challenging procedure that needs a highly efficient algorithm. The collective behavior of decentralized, self-organized natural or artificial systems is known as swarm intelligence (SI). The migration patterns of butterflies serve as the inspiration for the Butterfly Optimization algorithm, a type of swarm intelligence metaheuristic algorithms.. In this enhanced Butterfly Optimization algorithm (BOA-PSO), the issue of feature selection is initially conceptualized and subsequently transformed into a fitness function. Next, we proposed an IBFPSO to address the issue of feature selection. In order to enhance the BOA and expand its applicability to feature selection issues, we integrated PSO into the BOA. Ultimately The proposed algorithm IBFPSO is benchmarked against , binary PSO (BPSO), Binary dragonfly algorithm (BDA), Binary grey wolf optimization approach (BGWO), Binary bat algorithm (BBA) and enhanced binary bat algorithm (EBBA). To evaluate these algorithms, five datasets were sourced from the UC Irvine Machine Learning Repository. The experimental findings reveal that the IBFPSO algorithm outperforms other comparative algorithms across all datasets. In the Breastcancer dataset, the accuracy rate for IBFPSO was (0.9886) compared to the closest algorithm's (0.9786). In the BreastEW dataset, the accuracy rate for IBFPSO was (0.9843) compared to the closest algorithm's (0.9614). In the Congress dataset, the accuracy rate for IBFPSO was (0.9874), whereas it was (0.9793) for the nearest algorithm. In the SpectEW dataset, the accuracy rate for IBFPSOwas (0.8556) compared to the nearest algorithm where it was (0.7407). In the tic-tac-toe dataset, the accuracy rate was (0.9791), while the closest algorithm's was (0.8521).

Keywords: Butterfly Optimization algorithm (BOA), Particle Swarm Optimization (PSO), Feature Selection, Optimization

AUTOMATED DETECTION AND CLASSIFICATION OF RETINOPATHY OF PREMATURITY STAGES USING SWIN TRANSFORMER

Nazar Salih (Al-Imam Al-Adham University College), Mais A. Al-Sharqi (Biomedical Informatics College, University of Information Technology and Communications), Aws Saad (Al-Imam Al-Adham University College) and Nebras Hussein (Al-Khwarizmi College of Engineering, University of Baghdad)

Abstract. Retinopathy of prematurity (ROP) stands as the leading cause of irreversible childhood vision loss, with its diagnosis and treatment based on subjective grading of retinal vascular features. Nonetheless, this method proves to be labor-intensive and prone to errors, prompting the need for automated approaches to enhance accuracy and efficiency. This study presents a pioneering method for the early detection of ROP in fundus images utilizing the Swin Transformer, a hierarchical vision transformer architecture. The research centers on ROP screening stages documented between 2015 and 2020, drawing from a dataset of 3720 retinal images from premature infants graciously provided by the Al-Amal Eye Center in Baghdad, Iraq. The suggested Swin Transformer model exhibits exceptional accuracy, achieving a 98.67% success rate. This represents a significant leap forward in this area, highlighting the potential of transformer-based structures for the accurate and effective diagnosis of ROP in clinical settings. The results emphasize the importance of the most recent in-depth learning methods in improving early detection techniques, ultimately contributing to improved clinical outcomes for at-risk infants.

Keywords: Health Care, Deep Learning, Retinopathy of Prematurity, Fundus Images, Swin Transformer.

LEVERAGING MACHINE LEARNING FOR ACCURATE OUTPATIENT CLASSIFICATION IN DIVERSE MEDICAL DATASETS

Zahraa A. Abdalkareem (Alimam Aladham University College), Aws Saad Shawkat (Alimam Aladham University College), Ali Fahem Neamah (Wasit University), Omar H. Salman (Network Department faculty of Engineering, Aliraqia University), Maan Nawaf Abbod (Alimam Aladham University College), Mustafa A. Mohamed (Alimam Aladham University College), Amiza Amir (University Malaysia Perlis) and Nada Q. Mohamed (Alnisoor university)

Abstract. Traditional classification patient case severity tools used in hospitals face limitations in managing the growing number of patients and analysing complex data. These challenges in patient classification highlight the need for more effective predictive methods. This study aims to utilize machine learning (ML) to develop an automated triage model for remote patients in telemedicine systems. The goal is to enhance the accuracy of health services and provide real-time health assessments for urgent cases. A comparative study of two supervised machine learning models, KNN and CNN, was conducted to determine which algorithm more effectively evaluates patient classification outcomes in outpatient care. Data from diverse, rapidly generated sources is essential for making informed patient classification decisions. This data, collected through IoMT-enabled sensors, includes

both sensory measurements (such as ECG, blood pressure, SpO2, and temperature) and non-sensory text-based data. The study evaluated six supervised machine learning algorithms, which were trained on patient medical data and validated based on their performance. These supervised ML models were implemented in Hadoop and Spark environments to accurately identify individuals with chronic illnesses. A dataset of 30000 patient records was used to assess the methods and identify the most effective approach for disease prediction. The simulation results highlight the powerful integration of ML in telemedicine to analyse data from heterogeneous IoMT devices, indicating that the KNN algorithm outperformed the CNN algorithms by 95.0% in terms of accuracy and other performance metrics. This result provides practical insights for the development of automated triage models in telemedicine systems.

Keywords: Internet of Medical Things, Chronic disease, Machine learning, Heterogeneous data

PAPER ID: ICCSIT 03

ANALYTICAL STUDY ON EMERGING TRENDS IN CARDIOMYOPATHY DETECTION THROUGH DIVERSE DATABASE CLASSIFICATION

Bushra Kamil (university of kufa) and Ebtesam Alshemmary (university of kufa)

Abstract. Heart failure (HF) remains a leading cause of mortality worldwide, with cardiomyopathy being a significant contributing factor. In recent years, artificial intelligence (AI) methods have shown promise in enhancing classification accuracy in this domain. This paper provides an analytical and comparative study of the latest cardiomyopathy classification techniques utilizing AI algorithms. The classification systems are grouped and compared based on the type of classifier model used. Additionally, they are categorized by the datasets employed, highlighting the aspects that significantly impact the efficiency and accuracy of these algorithms. The objective is to guide researchers in selecting appropriate classification models for real-time clinical applications. The study identifies the most effective AI algorithms and datasets for cardiomyopathy classification, demonstrating improved diagnostic accuracy and the feasibility of real-time application in clinical settings.

Keywords: Classification, Cardiomyopathy, Regression, CMR, ECG, Trees.

PAPER ID: ICCSIT 05

EXPLORING PRUNING AND QUANTIZATION TECHNIQUES FOR DEEP TRANSFER LEARNING MODELS FOR DIABETIC RETINOPATHY DISEASE IMAGE CLASSIFICATION

Raghad H. Abood (Informatics Institute for Postgraduate Studies, Iraqi Commission for Computers and Informatics) and Ali H. Hamad (Department of Information and Communication Engineering, University of Baghdad)

Abstract. Diabetic retinopathy (DR) and various other retinal diseases provide substantial public health challenge in worldwide. Deep learning has facilitated novel opportunities for the automation of retinal image classification. In this paper, we present the efficacy of three commonly utilized deep transfer learning models, namely VGG19, DenseNet121, and EfficientNetB6, in the classification of retinopathy utilizing the APTOS2019 dataset. Furthermore, data amalgamation is conducted by combining Messidor

2 with IDRiD to yield an expanded collection of retinal images. Additionally we explore the utilization of lightweight methodologies such as pruning, quantization-aware training (QAT), and post-training quantization (PTQ) to diminish model size and generate models suitable for deployment on devices with constrained computational capacities. The experimental outcomes showcase the effectiveness of the selected deep learning architectures in precisely categorizing the severity levels of retinopathy. Additionally, it is demonstrated that lightweight techniques proficiently reduce model dimensions without compromising accuracy in classification. The lightweight techniques shows a decrease in model size by factor eliminating weights that are close to zero or due to low-precision representations for the weights and activations of the models.

Keywords: Transfer learning, Diabetic Retinopathy, Pruning, Quantization Aware Training, Post-training Quantization

PAPER ID: ICCSIT 13

REAL TIME HOSPITAL SELECTION FRAMEWORK FOR MULTI CHRONIC DISEASE PATIENTS IN TELEMEDICINE SYSTEM: TOWARDS MORE PERSONALIZE HEALTHCARE SERVICES

Noor Farhan (Imam Al- Kadhum College (IKC)), Omar Salman (Al-Iraqia University) and Abdulrahman Jasim (Altinbas University)

Abstract. Introduction: The development of an integrated healthcare system has become a personally important issue in the healthcare industry because of the rapid increase in the prevalence of several chronic diseases. The provisioning of personalized healthcare service (PHS) is one of the challenges facing researchers in the fields of telemedicine and the Internet of Medical Things (IoMT) and is related to several issues. One of the main issues is providing the remote patients with the required pre-hospital services which includes the determination of the patient's emergency level and selecting the proper hospital.

Objective: This study aims to improve the provisioning of PHS for the multi chronic disease elderly patients who use telemedicine system through utilizing medical sensors and non-sensors IoMT devices. The provisioning of PHS includes determination of the patient's emergency level (triage level), identifying the disease, and selecting the proper hospital in terms of availability and location.

Method: The proposed framework called Multi Sources Healthcare Architecture-2 (MSHA-2) which is a new extension version for our previous proposed framework MSHA. (MSHA-2) accommodated the patient with different contingency levels based on seven medical devices, namely, sensors for blood glucose, blood pressure, ECG, SPO₂, body temperature and respiratory rate and input medical texts. MSHA 2 framework proposes two computational algorithms to achieve the required tasks.

Results: The simulation of MSHA-2 is proposed in Baghdad, the capital city of Iraq, as the real physical locations for 34 private and governmental hospitals are determined using Google map coordinates. The appropriate hospital for the patient was identified in accordance with the patient's coordinates, which were taken from a GPS sensor. According to common evaluation performance criteria, MSHA-2 outperformed two benchmark models. MSHA-2 obtained 90% of the total services, whereas the benchmark studies obtained 45% and 45% respectively.

Conclusion: This study proposes a unique advance healthcare solution which supports the healthcare digital transformation plans in Iraq. Selecting the proper hospital to the patient can save patients' lives. Future works are planned to improve MSHA-2 by considering medical record and identifying alternative hospital in case of disaster are open research directions for future work

Keywords: Internet of Medical Things (IoMT), Scalability, Heterogenous, treatment plan, Homogeneous, Iraq

PAPER ID: ICCSIT 15

ENHANCING MEDICAL IMAGE ANALYSIS WITH CNN AND MOBILENET: A PARTICLE SWARM OPTIMIZATION APPROACH

Asmaa Ghali Sabea (Law , sumer university), Maryam Jawad Kadhim (Computer science Department, Computer Science and IT Faculty, Wasit University, Al-kut, Iraq), Ali Fahem Neamah (Computer science Department, Computer Science and IT Faculty, Wasit University, Al-kut, Iraq) and Mohammed Ibrahim Mahdi (Computer science Department, Computer Science and IT Faculty, Wasit University, Al-kut, Iraq)

Abstract. Abstract: Recent advancements in deep learning (DL) have shown significant promise in enhancing diagnostic accuracy (ACC) in medical imaging. This study explores the application of Convolutional Neural Networks (CNN) and the MobileNet architecture, optimized with Particle Swarm Optimization (PSO), for the classification of chest X-ray images. Our findings reveal that the CNN achieved impressive classification metrics, with a precision (PER) of 0.94, recall (REC) of 1.00, and an F1-score (F1-s) of 0.97 for the control class. Similarly, for the COVID- 19 class, the CNN exhibited a PER of 0.86 and a REC of 0.92, culminating in an F1-s of 0.89.

The MobileNet model, prior to PSO optimization, showed remarkable PER and REC across all classes, with overall ACC reaching 0.95. Post-PSO, MobileNet retained an overall ACC of 0.95, with marginal adjustments in PER and REC values, indicating refined model performance. Notably, the control class's PER improved to 0.99 after PSO, and the COVID-19 class saw an increase in REC to 0.98.

These results underscore the potential of using sophisticated Machine Learning (ML) models to aid in the rapid and accurate diagnosis of pulmonary diseases. The high ACC and F1-ss suggest that both CNN and MobileNet models, particularly when enhanced by PSO, could serve as reliable tools in clinical settings, augmenting the capabilities of medical professionals in the interpretation of chest X-rays.

Keywords: Diseases, covid-19, classification, MobileNet, PSO

PAPER ID: ICCSIT 21

FEATURE FUSION FOR IMPROVED SKIN CANCER DIAGNOSIS USING SUPPORT VECTOR MACHINES

Ali Fahem Neamah (Faculty of Computer Science and Information Technology, Wasit University, Iraq), Ahmad Shaker Abdalrada (Faculty of Computer Science and Information Technology, Wasit University, Iraq), Mohammed Ibrahim Mahdi Ibrahim Mahdi (Faculty of

Computer Science and Information Technology, Wasit University, Iraq) and Ihtiram Raza Khan (Computer science Department, jamia hamdard , new delhi, india)

Abstract. Abstract—the early detection and successful treatment of skin cancers, a potent form of cancer, calls for the use of sophisticated diagnostic instruments. This study delves into the use of support vector machines (SVMs), to cope with the inconsistencies occurring among skin lesions, by merging them with feature fusion techniques. SVMs are preferred for this situation, as they are highly effective when it comes to the management of exceedingly dimensional data. Initially, in order to train and enhance the diagnostic capacity of the SVM classifier, a single and all-inclusive single dataset was generated through the analysis, identification and extraction of a wide variety of explanatory features (including colour, texture and shape) from a dataset comprising 10000 dermatoscope skin lesion representations. This was followed by the use of early and late fusion approaches, to generate an extensive dataset of descriptions, for assessing the reliability of the SVM classifier. Finally, the accuracy, precision and recall of the SVM classifier were ascertained by way of an objective dataset, comprising 25 dermatoscope representations of malignant and benign lesions. The accuracy, precision and recall of the SVM classifier are supported by its capacity to distinguish 10 true positives, 12 true negatives, three false positives and zero false negatives. As such, the SVM classifier can be considered effective, for the early detection of skin cancers. The results from this investigation verify that the capacity of SVMs, in terms of skin cancer diagnosis, is greatly improved with the utilization of feature fusion techniques. Also verified through this undertaking, is the effectiveness of innovative computational procedures, for the delivery of dependable medical diagnoses.

Keywords: Extraction Feature, Feature Fusion, Techniques Machines, Medical Image Classification, Skin Cancer Diagnosis, Support Vector

PAPER ID: ICCSIT 24

DIAGNOSIS OF SKIN MELANOMA UTILIZING AN ADVANCED COMBINATION OF IMPROVED META-GVF ALGORITHMS

Zaid S. Naama (Computer Science Department, College of Science for Women, University of Baghdad, Baghdad, Iraq), Safa S. Abdul-Jabbar (Computer Science Department, College of Science for Women, University of Baghdad, Baghdad, Iraq) and Amer Almahdawi (Computer Science Department, College of Science for Women, University of Baghdad, Baghdad, Iraq)

Abstract. The increasing prevalence of skin cancer worldwide has recently emerged as a significant public health issue. Although melanoma represents a mere 1% of skin cancer incidence, it is responsible for the majority of skin cancer fatalities. Timely identification of melanoma is crucial since it significantly increases the 5-year survival rate to over 90%. Nevertheless, metastatic melanoma has a bleak prognosis, with a mere 10-15% survival probability over five years. Computer-aided diagnostic systems using machine learning and deep learning models have shown encouraging results in studying skin lesions and identifying melanoma. Nevertheless, the accuracy of diagnosing melanoma is currently limited by obstacles such as the absence of clear colour differences in skin lesions and good techniques for assessing the thickness of the melanoma, which is essential for prognosis and treatment decisions. This study proposes a novel method for diagnosing skin melanoma using an advanced mix of advanced Meta-GVF algorithms.

Keywords: Skin Melanoma, Meta-GVF Algorithms, Image Segmentation, Active Contour Models, Computer-aided Diagnosis

PAPER ID: ICCSIT 30

A HYBRID TRANSFER-LEARNING MODEL FOR CLASSIFYING OCULAR DISEASES USING DEEP LEARNING NETWORKS AND MACHINE LEARNING ALGORITHMS

Walaa Abdul Latif (College of Computer science & information technology, University of AL-Qadisiyah, Iraq) and Ass.Prof. Dr. Ali Mohsin Aljuboori (College of Computer science & information technology, University of AL-Qadisiyah, Iraq)

Abstract. Ocular diseases such as glaucoma, diabetic retinopathy, and cataracts are among the main causes of visual impairment worldwide. Early detection of these diseases may pose a challenge for doctors, as diagnosing ocular diseases manually is difficult, may take a long time, requires effort and experience, and is subject to error. Intelligent systems must be developed to discover ocular issues using computers that employ advanced machine learning algorithms and deep learning networks. In this study, a transfer learning method was applied, in which features were retrieved from the data set using convolutional neural networks and then classified using machine learning algorithms this approach was utilized to address the issue of multi-class classifications and improve classification precision. The model used the ocular diseases intelligent recognition (ODIR) dataset. The dataset contains 10,000 images of both the right and left oculars of 5,000 patients suffering from ocular problems. Several data classifications were implemented in this work. Initially, the data was classified as either 0 or 1, and the normal class was included with all disease classes. This binary classification led to high accuracy in both deep learning networks and all classifiers, reaching 100%. The second classification was by taking all eight classes, which achieved the highest accuracy using the proposed convolutional neural network, reaching 92.15% for the support vector machine (SVM) classifier and the last classification was a multiple classification, taking only six categories of diseases, with a binary classification for the remaining two categories, which are normal and abnormal. The highest accuracy of the proposed CNN was achieved which reached 99.92% for the decision tree (DT) classifier to multiple classification and 99.52% for binary classification.

Keywords: deep learning networks, ocular diseases, Transfer learning, ODIR, image classification

PAPER ID: ICCSIT 41

DEEP LEARNING APPROACHES FOR ACCURATE DIABETIC RETINOPATHY DETECTION AND CLASSIFICATION: COMPARISON STUDY

Mohammed Ibrahim (University of Qom) and Amir Lakizadeh (University of Qom)

Abstract. In order to prevent irreversible blindness among adults aged 18-65, it is imperative to accurately diagnose and treat diabetic retinopathy (DR) as early as possible. As such, the present study endeavoured to compare the efficacy of four deep learning (DL) models; namely, convolutional neural networks (CNN), residual networks (ResNet), inception architecture (IA), and densely connected convolutional networks (DenseNet); at detecting and classifying DR into different levels of disease

severity. The Kaggle DR Detection dataset was used to assess the classification accuracies while a loss function (LF), that combines the loss of cross-entropy with additional penalties for classification errors, was introduced to overcome class imbalance issues and improve the performance of the four examined DL models. The DenseNet model had the highest accuracy, recall, precision, F1-score, and area under the receiver operating characteristic curve (AUC-ROC) of the examined models, by scoring 90, 89, 88, 88%, and 0.92, respectively. This performance was closely followed by that of the ResNet model. The findings indicate that the architecture of the model, especially that of models that will be used for medical image classification (MIC), must be taken into account when selecting which model to use. Furthermore, the proposed customised LFs enhanced the precision and resilience of the examined DL models. Screening tools that can accurately diagnose DR early, with limited to no intervention from an ophthalmologist, will enable them to treat patients significantly earlier, thus improving patient outcomes. As such, the development of such models is imperative. However, various datasets should be used to substantiate the accuracy of these models. Their efficacy could also be improved by combining supplemental clinical data as well as examining the use of hybrid architectures.

Keywords: Deep Learning, Convolutional Neural Network (CNN), Diabetic Retinopathy, Medical Image Classification

PAPER ID: ICCSIT 46

AUTOMATED EARLY DETECTION OF ROP ZONES USING SWIN TRANSFORMER

Nazar Salih (Al-Imam Al-Adham University College), Mostafa Khaled (Al-Imam Al-Adham University College), Mohammed Rashid (College of Petroleum Processes Engineering, Tikrit University, Tikrit, Iraq), Nebras Hussein (Al-Khwarizmi College of Engineering, University of Baghdad), Mohamed Ksantini (National Engineering School of Sfax, University of Sfax, Sfax, Tunisia) and Amina Turki (National Engineering School of Sfax, University of Sfax, Sfax, Tunisia)

Abstract. Retinopathy of prematurity (ROP) is known to be the primary cause leading to permanent vision loss in children, which calls for its diagnosis and treatment based on subjective assessment of retinal vascular characteristics; even though this traditional approach is practical, it takes much time and likely results in errors. Therefore, automation is required not only to enhance precision but also productivity. The study proposes an innovative approach to early detection of ROP zones on fundus images between 2015 and 2020. It will use the Swin Transformer model, which has demonstrated superior precision and achieved a performance rate of 90.11%. This work denotes significant advancement in this field, emphasizing the potential of transformer-based architectures for the precise and efficient detection of ROP in clinical environments. The findings underscore the significance of utilizing state-of-the-art, comprehensive learning approaches to enhance early detection procedures, improving clinical outcomes for at-risk newborns.

Keywords: Health Care, Deep Learning, Retinopathy of Prematurity, Fundus Images, Swin Transformer.

A SYSTEM FOR MONITORING CHRONIC DISEASE PATIENTS IN NURSING HOMES USING MACHINE LEARNING TECHNIQUES

Ammar Al-Mousawi (University of Kufa) and Mali Alameady (University of Kufa)

Abstract. Using modern technology for managing and delivering care targeted

specifically for the elderly is referred to as "digital care." The accuracy and quality of healthcare are enhanced through such technologies, which gather patient data electronically and use it for streamlining the care process. Leveraging the potential of emerging technology and digitization could improve healthcare services' efficiency and effectiveness. The lack of health information systems and digital tools at all levels of healthcare, the sluggish adoption regarding manual medical records, the high cost of devices, and the inadequate privacy protection are just a few of the obstacles that must be overcome. In order to save lives, the present study intends to enhance the fall detection system linked to chronic diseases. The suggested solution is designed with the use of machine learning (ML) algorithms to improve fall detection for this reason. For recognizing particular conditions such as (walking, sitting, crawling, falling, etc.). For assessing and testing the suggested model, the research employed the datasets (sisfall) and (cStick), which were sourced from Kaggle. Furthermore, a variety of ML methods have been applied, including logistic regression, (LR) random forest (RF), SVM, decision trees (DTs), and KNN. For the DT algorithm, the computed accuracy in (sisfall) was 99.16%, while for KNN algorithm, it was 99.8% in (cStick).

Keywords: Monitoring Chronically, Chronic Disease Patients, Elderly Patients, Nursing Home, Machine Learning

GLAUCOMA DISEASE DIAGNOSIS-BASED DEEP LEARNING NETWORK

Rawaa Humam (it.mast.23.4@qu.edu.iq) and Dr.Lamia Abednoor Muhammed

Abstract. Increased intraocular pressure and optic nerve damage, which may cause irreversible blindness, are the hallmarks of glaucoma. If this disease is identified early on, its severe effects can be prevented. However, among the older population, the illness is often identified at a later stage. Consequently, individuals may be spared irreversible visual loss by early identification. Ophthalmologists use a variety of expensive, time-consuming, skill-oriented techniques when manually assessing glaucoma. A definitive diagnostic method for early-stage glaucoma detection is still elusive, while a number of approaches are in the experimental stages of development. We offer an autonomous deep learning-based technique that has very high accuracy in detecting early-stage glaucoma. The detection method entails identifying patterns in the retinal pictures that physicians frequently miss.

Keywords: 1 Glaucoma, 2 optic nerve damage, 3 deep learning, 4 retinal pictures

COVID-19 IN IRAQ'S PROVINCES FORECASTED USING MACHINE LEARNING

Mustafa Albadri (University of Baghdad), Ammar Alzubaidi (University of Baghdad) and Mohammed Al-Mukhtar (University of Baghdad)

Abstract. More than 4.5 million people have died because of the recent coronavirus pandemic which depends on the statistical analysis as reported from WHO, 2020. If this disease had been ignored, this highly contagious disease could quickly spread and overwhelm healthcare systems. Nonetheless, the use of machine learning algorithms to track analytical data has a significant impact on how quickly decisions are made in some government organizations. This study concentrated on the various trends and anticipated spread of the Iraqi pandemic to encourage individuals and governments to take preventative action. This work serves as a well-established baseline to illustrate the potential of machine learning for pandemic prediction. We have used publicly available datasets and models to show the efficiency of our approach. Machine learning (ML) approaches have proven useful in the rapid identification and delineation of infectious areas in radiological images. In this paper, two types of experiments have been conducted, utilizing numbers analysis, active cases, death cases and recovered cases. The target areas in this paper were four Iraqi provinces which includes more than 15 million people all over the country. Two Time series forecasting methods have been applied to learn the old cases and predict the new cases. SARIMAX and ARIMA algorithms were applied in this experiment. SARIMAX algorithm shows better results compared to ARIMA algorithm. These results were compared to logistics algorithms as well as for the same geographical zones.

Keywords: COVID-19, ARIMA, SARIMAX, machine learning

PIPELINE LEAK DETECTION OIL BASED ON ARTIFICIAL INTELLIGENCE

Hiba Owaid Ghazzay (University Thi-Qar) and Mustafa J. Hayawi (University Thi-Qar).

Abstract. Abstract. Oil leaks pose a major threat to marine and terrestrial environments. Hence, automated detection and continuous monitoring systems are attractive options to reduce the response time of any relevant operation. Many efforts have been made towards such solutions by exploiting a variety of sensor systems. Computer vision plays a major role in pipeline leak detection systems and is one of the state-of-the-art technologies. This paper describes the development of an approach that combines the advantages of deep CNN and SAR imagery to provide a fully automated oil spill detection system. We present a deep learning framework for oil spill detection using transfer learning techniques using AlexNet, Densnet201, and ReseNet50, where models are pre-trained on the ImagNet dataset. The datasets were divided into two sets and their respective annotations (1606 for training and 401 for testing). AlexNet provided better results (99.3% accuracy, 98.7% precision, 99.8% recall, and 99.3% F-score). The results of this study are very promising and provide improved accuracy comparable to related work.

Keywords: Oil Leak Detection, Convolution Neural Networks, AlexNet Model.

ARABIC BOOK SEMANTIC RECOMMENDATION SYSTEM BASED IN NLP AND MODEL DEEP LEARNING BY MARGE TWO VECTOR MODELS

Rasha kadhem (Department of Computer Science, Faculty of Sciences of Monastir, University of Monastir), Souheyl Mallat (Research Laboratory in Algebra, Numbers theory and Intelligent Systems, Monastir, Tunisia) and Mounir Zrigui (Department of Computer Science University of ALQadisiyah , Iraq).

Abstract. This study introduces a methodology for constructing an Arabic recommendation system for books using semantic content. The suggested approach includes preparing the dataset, preprocessing the data, and converting it into numerical feature vectors through two different models: TfidfVectorizer and Word2Vec. To generate the final recommendation, a voting system is used to combine the outputs of both models. The performance of this methodology is assessed by comparing it with other similar systems to determine its effectiveness. The dataset utilized in this study includes information about more than 8000 Arabic books, including their title, author name, book description, number of pages, publication year, publisher, cover type, category and subcategory. The preprocessing steps involve tokenization and removal of stop words while vectorization involves the application of TF-IDF and Word2Vec models. The recommendation system is generated by comparing the user's query vector with the vectors generated by both models resulting in presenting the top three recommendations to the user. This methodology has potential uses such as analyzing trends in sales of Arabic books or developing machine learning models for recommending books.

Keywords: Arabic, semantic content, recommendation system, machine learning.

TRACK 2: SECURITY

EFFECTIVE EN-CODING SYSTEMS BASED ON ADDRESS FOR MOBILE NETWORKS SECURITY

Mustafa Yaseen (Iraqi Ministry of Education), Waleed khalid Ahmed2 (Middle Technical University Electrical Engineering Technical College)

Abstract. Providing security support for Mobile ad hoc networks (MANETs) is a challenging task. Eavesdropping is a major threat to the security of mobile networks. Proposed method in this research clarifies the way to solve the difficulty of designing threats. A address based on coding system (ACSS) as a combination of Add hoc node address and public key de-coding. ACS is a public key without a certificate encoding solution in that public keys of mobile nodes are directly derivable from their known addresses, and hoc node addresses plus some common information. Thus, it eliminates the need for the general distribution key based on the certificate is essential in planning of the general management of public-key. ACS is an effective constructive method of address based on public/private keys encoding, which is not only ensures high level of authenticity to node exchange information, but also enables efficient network wide secure key update via a single broadcast message. It also provides general information about how to choose the secret key sharing parameters used with public key encoding to meet desirable levels of security and authentication. The justification of ACS advantages in comparison with solutions based on the current certificate through a wide ring simulation processes. The proposed system of ACS gives a new innovation towards more effective and efficient security design for MANETs.

INNOVATIVE ENSEMBLE STRATEGIES FOR ENHANCED INTRUSION DETECTION AND CYBERSECURITY DEFENSE

Hazem Salim Abdullah (Directorate of Municipalities Nineveh Governorate, Mosul, IRAQ) and Mario Maroun (Computer Science Department, Faculty of Sciences and Fine Arts, AUL Beirut, Lebanon)

Abstract. ABSTRACT: Cybersecurity is a priority problem in the 21st century as the acts of cyber-threats and their severity are rapidly increasing, affecting the systems of individuals, companies, and governments. Intrusion Detection Systems (IDS) are a crucial part of the security palette as they can locate and respond to unauthorized actions inside a network. This paper proposes the utilization of AI mechanisms in the capacity addition of intrusion detection procedures. The study determines the suitability of the ML algorithms in developing intrusion detection systems that are precise and effective. These machine learning-based techniques are assessed with the aid of benchmark datasets and real-time network traffic scenarios represented by NSL-dataset to verify their performance, stability, and agility. On the other hand, this paper will deal with the integration of a machine learning-based intrusion detection system within the current cyber-security framework, which includes the challenges of scalability, interpretability, and false positive reduction. The findings of this study provide a significant improvement and increase in accuracy using the clustering technique, with results obtained using the voting classifier and then with the stacking classifier, resulting in improved accuracy performance of 96.86% and 99.91%, respectively. It aims to improve cybersecurity and protect the digital sphere from cyber threats

Keywords: Cyber Security, Intrusion Detection System, Machine Learning, Ensemble Machine Learning

RVGAC: ROUND VARIABLE GENERATION AUTHENTICATION CODE BASED ON RIJNDAEL-FEISTEL BLOCK CIPHER ALGORITHM IN NETWORK SECURITY.

Yousif Flaieh (Post-graduate student at Islamic University of Lebanon (IUL), Lebanon), Hala Albaroodi (Gifted guardianship committee, in Ministry of Education, Baghdad/Iraq) and Ahmed Ghandour (Department of Computer and Communication Engineering, Islamic University of Lebanon, Lebanon)

Abstract. It has become common in our time to witness hacking taking place here and there in the world, with hardly a day passing by without such incidents. This has become so common that even individuals, institutions, and departments with high-security privacy are not spared from privacy breaches. Encryption technology plays a crucial role in protecting data stored and transmitted through cyberspace, forming the basis of cybersecurity. In this paper, we propose a symmetric-key block cipher algorithm designed based on the Rijndael and Feistel criteria. This algorithm has high complexity and the ability to resist known attacks, such as linear attacks. The algorithm's generated sequences were subjected to NIST statistical tests and avalanche tests, which showed that they possess good statistical and randomness properties. Additionally, the algorithm implements both confusion through the use of FS-boxes and S-Boxes and diffusion through the implementation of Addroundkey, P-Vector, and Mixed Column. Therefore, these sequences, coupled with the complexity of the Round Variable Generation Authentication Code (RVGAC) algorithm, make it suitable for use in various cryptography applications.

Keywords: block, decryption, encryption, Feistel, NIST, RIJNDAEL, RVGAC, symmetric key

DETECTING DDOS ATTACKS USING MACHINE LEARNING

Sarah Zghair Arrak (Al-Qadisiyah University) and Rana Jumma Surayh Al-Janabi (Al-Qadisiyah University)

Abstract. The rise of networking and programming systems has led to a corresponding increase in the demand for cybersecurity. Cyber attacks pose an ever-changing threat to individuals and businesses alike. Distributed Denial of Service (DDoS) is a highly destructive cyber attack that has rapidly become popular among hackers. Despite new preventive measures and technological advancements, the threat is rising. The widespread use of DDoS services, which can be performed by anyone with little expertise and talent, has increased the danger significantly. Hence, it is crucial to identify and respond to these attacks quickly to mitigate their impact. This study introduced an ensemble technique called stacking classifiers to improve the performance of individual classifiers and reduce the probability of misclassification. This work used K-Nearest Neighbors as a meta-classifier and basic individual classifiers such as Support Vector Machine and Gaussian Naive Bayes, and two techniques were used to select important features. Training and testing were performed using the CICIDS 2017 dataset. With a split of 80% for training and 20% for testing, the stacking classifier achieved a high accuracy of 0.9989 compared to the following classifiers: Gaussian Naive Bayes and Support Vector Machine 0.9809 and 0.9773 respectively, with the extra tree feature selection technique,

Keywords: distributed denial of service, DDoS attack detection, machine learning algorithms(ML)

DARKNET TRAFFIC DETECTION USING HYBRID CLASSIFICATION MODELS IN NETWORK OS ENVIRONMENT

Abbas A Abdulhameed (Mustansiriyah Unevirsity/Computer Science Dep.), Sundos A. Alazawi (Mustansiriyah Unevirsity/Computer Science Dep.), Mostafa Abdulghafoor Mohammed (Imam-aladham Unevirsity) and Ghassan Muslim (Ashur University)

Abstract. Most dark web users are cyber attackers and those who engage in illegal activities. Various network operating systems, including Windows, macOS, and Linux, play an important and crucial role in the so-called dark web through Tor, as Tor can be installed on those systems that are specifically designed to take anonymity and privacy into account to enhance security in accessing the dark web. For this reason, a hybrid predictive model in two layers is proposed to detect and classify normal and abnormal traffic activity on the dark web. Mainly, deep learning techniques have been used, including convolutional neural network in multiple classification and deep learning network in binary classification. CIC-Darknet dataset is used, which includes non-VPN/non-Tor and VPN/ Tor traffic for binary classification and is associated with eight types of web traffic Audio streaming, Browsing, Chat, Email, File transfer, Video streaming, P2P, and VOIP that mainly used in multiclassification, covering a wide range of network attack data related to cybersecurity. Features select by Information Gain (IG) is used for preprocessing operation before classification stage is performed. The performance analysis show that CNN offer 0.958 precision in VOIP class in multiclass layer, while DLN in binary class layer has the highest precision with 0.993 to predicate VPN class for P2P and 1 present to predicate non-VPN class for Browsing and Video streaming.

Keywords: Network Operating System, Dark web detection, Machine learning, CNN, Dark traffic

Design and Implementation of FPGA IoT-Based Parallelized Architecture

Nada Mohammed (Al_Nisour University) and Badlish Ahmed (Faculty of Electronic Engineering Technology, Universiti Malaysia Perlis (UniMAP))

Abstract. The Internet of Things (IoT) is a network that allows devices to collect and process information from remote locations without human intervention. IoT devices process huge amounts of data that is sent, processed and stored. This is accompanied by an increase in threats of information being accessed, stolen, destroyed, or modified during storage or transmission through unsecured channels. High-security encryption algorithms such as architectural and engineering services require high computing power to achieve information security. However, most IoT devices have limited processing power. Therefore, various methods have been introduced to achieve parallel processing using a parallel computing architecture that uses modern techniques in both spatial and temporal parallelism in order to obtain the maximum possible computing power. One of them is field programmable gate array (FPGA), which has excellent characteristics It is suitable for implementing parallel architectures with low power consumption. The purpose of this paper is to design and implement a compact high-performance transceiver architecture for multicompetent processing to improve throughput, using spatiotemporal parallelism on FPGA technology for image encoding and decoding. This architecture is efficient and suitable for high-speed processing within IoT applications

Keywords: FPGA, IoT, AES, Embedded System, Parallelism

PAPER ID: ICCSIT 35

FORTIFYING WIRELESS SENSOR NETWORKS: MACHINE LEARNING EMPOWERED INTRUSION DETECTION FOR ENHANCED SECURITY

Ali Mohammed (Ministry of Education), Hasanain Altareehee (Ministry of Education) and Aqeel Almahmodi (Ministry of Education)

Abstract. Wireless Sensor Networks (WSNs) play a role, in systems and Internet of Things (IoT) applications. However, ensuring the security of WSNs is challenging due to their vulnerability to access and intrusions. This research focuses on enhancing the security of WSNs by employing machine learning techniques for detecting intrusions. By utilizing machine learning algorithms WSNs can enhance their security measures by detecting and responding to intrusions effectively. This article explores machine learning algorithms, strategies and challenges associated with intrusion detection systems based on machine learning, in WSNs. The goal is to highlight how machine learning can strengthen the security of sensor networks.

Keywords: Wireless Sensor Networks, Wi Fi, multiclass classification Security concerns

PAPER ID: ICCSIT 20

ANALYZING THE SECURITY VULNERABILITIES OF USING FRACTAL IMAGES IN ENCRYPTION AND HIDING INFORMATION

Alaa A. Alsaffar (Al-Kunooze university college), Qasim M. Hussein (Al-Kunooze university college), Naji M. Suhib (Al-Kunooze university college) and Noor Q. Mohammed (Ministry of Education)

Abstract. Fractals are one of the approaches, which are used as a base in designing and implementing cryptography and steganography algorithms to secure sensitive information due to the randomness and chaotic nature of these fractals. Even though fractals sets seem to possess chaotic behavior, they have some weak points and vulnerabilities that help the analysts of cryptography and steganography to have information, which enable them in attacking the plaintext of sensitive information. In this paper, an analysis of algebraic fractals images is conducted to identify the weak points and vulnerabilities, which could represent threat sources, from using these images as a base in cryptography and steganography algorithms. Furthermore, the paper includes some guidance and hints to system designers for enhancing the security when using fractal images in order to overcome these vulnerabilities and avoid threats that exploit these vulnerabilities.

Keywords: Fractals, Encryption, Hiding data, Cryptography, Steganography, Vulnerabilities, Julia sets, Mandelbrot sets, Symmetric properties, Security attack, Threats

PAPER ID: ICCSIT 14

PHISHNETVAE: AN INTEGRATED VARIATIONAL AUTOENCODER AND DEEP NEURAL NETWORK APPROACH FOR ENHANCING CYBERSECURITY STRATEGIES BY DETECTING PHISHING ATTACKS

Esraa Hameed Kamel (Wasit University), Mohammed Ibrahim Mahdi (Wasit university), Ali Fahem Neamah (Wasit university), Riyadh Rahef Nuiiaa (Wasit University), Saif Ali Abd Alradha Alsaidi (Wasit University), Ali Hakem Alsaeedi (Universitas of Al-Qadisiyah) and Selvakumar Manickam (Universiti Sains Malaysia)

Abstract. Rapidly increasing of nodes connected to the internet such as smart phone, IoT devices, autonomous vehicles, health care and everywhere in our life has become connected with these services. Amid this massive increase and growth in the use of these services, it can be said that the curve of phishing cyberattacks is increasing in parallel with the rising demand for online services. Therefore, the development and evolution of phishing cyberthreats methods are among the most significant obstacles facing service providers as well as governments. In this paper a new approach has been developed to detect phishing cyberattacks by integrating the Variational Autoencoder and Deep Neural Network which called PhishNetVAE approach to enhance the detection accuracy. The proposed PhishNetVAE approach is evaluated through the ISCX-URL2016 dataset, and the results show that the PhishNetVAE approach achieves a detection accuracy is 99.80% and very low false positive is 0.18%. The proposed PhishNetVAE approach is compared with the recent related works literature under the same conditions.

Keywords: cyberattacks, phishing attack, Variational Autoencoder (VAE), Deep Neural Network (DNN), phishing threat

PAPER ID: ICCSIT 08

PREDICTING FRAUD: A MACHINE LEARNING APPROACH TO SECURE TRANSACTIONS IN CREDIT CARD SYSTEM

Bashar Hameed (Computer Science Department, Al-Imam Al-Adham University College, Baghdad, Iraq), Mohammed Mohammed (Computer Science Department, Al-Imam Al-Adham University College, Baghdad, Iraq) and Humam Yaseen (Computer Science Department, Al-Imam Al-Adham University College, Baghdad, Iraq)

Abstract. The expansion of e-commerce has uncovered extensive vulnerabilities in web-based transactions, developing fraudulent opportunities. The enormous use of credit cards in on-line transactions, motivated by way of their perks like price reductions and bonuses, has also caused a substantial upward thrust in credit card fraud. Conventional strategies including hand checks and inspections, even as traditionally employed, have validated great obstacles in identifying fraudulent actions due to their time-intensive task, cost, and imprecision. The emergence of Artificial Intelligence (AI), Machine Learning (ML) and, Deep Learning (DL)-based techniques provides a promising innovative solution for addressing fraudulent actions with the aid of permitting the pattern recognition and anomaly detection of financial transactions. Even with recent advances in research into ML-based credit card fraud detection, the imbalance in credit transaction data makes identifying fraudulent actions a difficult challenge. This paper presents an advanced credit card fraud detection model using ML and DL algorithms; however, it is very important to investigate the scenario of anomaly detection about the characteristics. This paper analyses a specific case study the credit card dataset, highlighting the important preliminary steps in creating the necessary processes before the proposed model is applied. Our experimental results demonstrate that the Logistic Regression (LR) and Convolutional Neural Network (CNN) models, particularly the combined model, achieved superior performance in evaluation metrics compared to the other models tested in our experiment.

Keywords: Fraudulent Financial Transactions, Credit Card, Fraud Detection, Machine Learning, Deep Learning

ENHANCED MUTUAL AUTHENTICATION SCHEME FOR FOG COMPUTING USING BLOCKCHAIN TECHNOLOGY

Saif Kareem (Al-Nahrain University, Baghdad, Iraq), Bashar Hameed (Computer Science Department, Al-Imam Al-Adham University College, Baghdad, Iraq) and Humam Yaseen (Computer Science Department, Al-Imam Al-Adham University College, Baghdad, Iraq)

Abstract. Abstract. Fog computing is an innovative concept that extends cloud services further and brings their capabilities even closer to end-users by extending them out as far as the network edge. Since edges operate on resources that are closer to the source of data, this goes a process in addressing some of the problems with traditional cloud computing - especially latency. Unfortunately, while this proposal offers some benefits it does not by itself ensure that edge devices are trustworthy or behaving securely. As a result, security continues to be one of the key focus points in fog computing deployment. In this context, authentication is an essential component of any security system. Traditional authentication systems do not work well in the fog computing context; therefore, an efficient mutual i.e. two-way authentication process should be used between edge devices and fog servers because of the low end-to-end latency constraints. This paper proposes an improved mutual authentication scheme specifically designed for fog computing environments to overcome these struggles. Our proposal scheme ensures mutual verification between fog servers and edge devices can effectively strengthen security against potential threats. It makes sure there is very low to no storage overhead on fog servers which increases efficiency, especially in resource-constrained environments. Our scheme is tested through extensive experiments and mathematical analysis.

Keywords: fog computing, Cloud computing, mutual authentication, Blockchain, security

ADAPTIVE HYBRID DEEP LEARNING MODEL FOR REAL-TIME ANOMALY DETECTION IN IOT NETWORKS

Esraa Saleh Alomari (Computer Department, College of Education for Pure Sciences, Wasit University, 52001 Al-Kut, Wasit, Iraq), Selvakumar Manickam (National Advanced IPv6 Centre (NAv6), Universiti Sains Malaysia, Gelugor 11800, Penang, Malaysia) and Mohammed Anbar (National Advanced IPv6 Centre (NAv6), Universiti Sains Malaysia, Gelugor 11800, Penang, Malaysia)

Abstract. The exponential growth of Internet of Things (IoT) networks has introduced significant challenges in maintaining security due to the heterogeneous and dynamic nature of connected devices. Traditional anomaly detection methods often fall short in such complex environments. This paper proposes an adaptive hybrid deep learning model combining Variational Autoencoders (VAEs) and Recurrent Neural Networks (RNNs) to address real-time anomaly detection in IoT networks. The VAE component efficiently extracts latent features from high-dimensional IoT data, while the RNN component captures temporal dependencies and detects deviations from normal behavior patterns. The proposed model is evaluated using publicly available IoT datasets, which contains normal and attack traffic from various IoT devices. Prospective results indicate that our hybrid model outperforms traditional machine learning and deep learning approaches in detecting anomalies, with significant

improvements in precision, recall, and F1-score. The adaptive learning mechanism of the model ensures continuous performance optimization in response to evolving IoT data streams. Our findings suggest that integrating VAEs for feature extraction and RNNs for temporal sequence modeling provides a robust framework for anomaly detection in IoT environments. This research contributes to the development of scalable and efficient security solutions, highlighting the potential of advanced deep learning techniques in enhancing IoT network security. Future work will explore federated learning approaches to further improve the model's scalability and applicability in decentralized IoT networks.

Keywords: IoT Networks, Anomaly detection, Deep learning, VAE, RNN

PAPER ID: ICCSIT 70

OPTIMIZING KEY RANDOMNESS IN STREAM CIPHER SECURITY USING PARTICLE SWARM OPTIMIZATION

Omar Dawood (University of Anbar), Hussein Almulla (College of Computer Science and Information Technology) and Mohammed Khalaf (University of Anbar)

Abstract. In modern communication systems, stream ciphers are commonly employed to ensure the confidentiality of the transmitted data. However, the security of these ciphers depends on the randomness and unpredictability of their keystreams. This paper investigates the application of Particle Swarm Optimization (PSO) to enhance the protection of the lightweight stream cipher. This paper introduces a fitness function that fits the domain to evaluate the randomness of the generated key. The fitness function considers the frequency of bits and distances among them to increase the randomness. By applying PSO and suited fitness functions to select the most optimal candidates based on their fitness scores, the resistance to known attacks is improved. The experimental results show that the proposed approach can generate highly random keys based on the NIST tests. Also, the fitness value indicates that the PSO with fitness function can explore a wider space.

Keywords: Stream cipher, Randomness, Particle Swarm, pseudorandom, Lightweight cipher

PAPER ID: ICCSIT 53

DEEP LEARNING BASED NETWORK INTRUSION DETECTION USING AWS CLOUD

Farah Faiq (Information Institute for Postgraduate Studies, Iraqi Commission for Computers and Informatics) and Mohammed Salih (BIT, Business Information College, University of Information Technology and Communications)

Abstract. These days, enterprises rely heavily on intrusion detection systems (IDS) due to the numerous cyberattacks that compromise security concerns related to confidentiality, integrity accessibility. Researchers started depending more on deep learning with the development of artificial neural networks and deep learning algorithms, which can produce features automatically without the need for human intervention. A neural network with a multi-level architecture is used in deep learning; this type of network differs from a machine learning network in that it is capable of learning and processing features on its own, after which it uses the architecture to produce changes in feature values. This study intends to increase the accuracy of intrusion detection for IDSs in cloud environments, as well as other performance measures. We use LSTM (Long Short Term Memory) designed to determine whether or not network traffic represented a hostile attack to deal with binary and multi-class classification on the

updated cybersecurity CSE-CIC-IDS2018 dataset this model demonstrated excellent accuracy throughout a range of tests about 99%.

Keywords: intrusion detection system, deep learning, CSE-CIC-IDS2018, long short term memory, Cloud Security

PAPER ID: ICCSIT 12

INCREASING CYBER-SECURITY IN INDEPENDENT VEHICLES THROUGH THE INTEGRATION OF VERIFICATION VECTOR MACHINES AND DEFENSE MULTIPLICATIVE ADVERSARIAL NETWORKS

Kholood J.Mawlood (Tikrit University)

Abstract. Autonomous vehicles (AVs) are a significant advancement in transportation technology, offering greater safety, performance and comfort. Traditional cyber-security solutions frequently fail to defend antivirus software from sophisticated assaults that exploit software and communication network flaws. This study proposes using Support Vector Machine Fused Defense Generative Adversarial-Network (SVM-DGAN) to improve cyber-security in autonomous vehicles. In cyber-security, SVMs can be employed for threat intelligence by analyzing data to identify patterns and classify data into different categories, such as normal behaviour or anomalous activities indicating potential cyber threats. Defense GANs are employed for adaptive defense mechanisms to enhance the resilience of machine learning models against adversarial attacks in autonomous vehicle cyber-security. Initially we gather dataset from controller area networks (CAN). Pre-process the gathered data using minimum-maximum normalization. The following elements were used to compare the traditional and proposed methods in terms of accuracy (98.50%), precision (98%), recall (98.25%), and F1-score (97%). It shows that our proposed method is effective in autonomous vehicle cyber-security. The findings of our study affirm the viability and effectiveness of the SVM-DGAN framework as a formidable defence against cyber threats targeting autonomous vehicles.

Keywords: Autonomous vehicles, Defence mechanisms, threat intelligence, SVM-DGAN, Cyber-attack

PAPER ID: ICCSIT 11

SECURING HEALTHCARE IOT ECOSYSTEMS: ANOMALY DETECTION AND RESILIENCE MECHANISMS FOR ENHANCED DATA PRIVACY AND TRUSTWORTHINESS.

Kholood J. Mawlood (Tikrit University) and Oqbah Salim Atiyah (Tikrit University)

Abstract. Internet of Things (IoT) device proliferation in healthcare facilities has produced previously unheard of potential for remote monitoring, effective better patient care. In this study we proposed a customized sand cat swarm driven updated random forest (CSCS-URF) comprehensive approach to address the challenges by focusing on anomaly detection and resilience mechanisms to enhance data privacy and trustworthiness in healthcare IoT ecosystems. The dataset is gathered; here we utilize the min max normalization for data cleaning and to select the data using recursive feature elimination (REF) to detecting abnormal behaviors or occurrences in IoT networks, which enables the early identification of potential security or data breaches. Performance evaluates thorough secure assessments of health care sector by using our proposed method. The parameter metrics used in this study are F1-score (95%), precision (94%), recall (96%), and accuracy (97%). To improve security and protect patient data and

anomaly detection has to be consisted in healthcare IoT networks. Healthcare professionals can minimize risks and assure system integrity by consistently keeping a check out for anomalous activity and potential risks. To remain ahead of the ever-changing cybersecurity threats facing the healthcare industry, it is essential to use cutting-edge technology and secure processes.

Keywords: Health Care, Anomaly Detection, Internet of things

PAPER ID: ICCSIT 29

IMPROVED BLOCKCHAIN ENVIRONMENT BASED ON POST QUANTUM ALGORITHM

Rasha Hani Salman¹ (informatics institute for postgraduate studies, Iraqi commission for computers &informatics, Bagdad, Iraq) and Hala Bahjat Abdul Wahab (2Computer Sciences Department, University of Technology, Baghdad, Iraq)

Abstract. Blockchain is a decentralized digital ledger technology that records transactions over a number of machines while maintaining security, immutability, and transparency. One of its main advantages is increased security due to its decentralized architecture, which is quite impervious to fraud and manipulation. Additionally, blockchain promotes openness by granting all stakeholders access to the same data, which guarantees accountability. Eliminating intermediaries also speeds up and lowers the cost of transactions and enhances traceability, making it easier to track the origin and history of assets. This research suggests using the lightweight post-quantum algorithm ASCON with blockchain technology to improve decentralization and security in contexts with limited hardware. The system's goal is to increase overall security and provide resilience against quantum assaults by substituting ASCON for the conventional SHA-256 algorithm. ASCON, a component of NIST's post-quantum cryptography standardization process, is perfect for Internet of Things devices since it is small, effective, and resistant to both classical and quantum attacks. The technology greatly improves the operating environment of resource-constrained devices by leveraging blockchain for data management and security and ASCON for privacy.

Keyword: post quantum algorithms, lightweight block chain, Ascon, SHA256, metric measure

TRACK 3: IOT , MOBILE APPLICATION, IMAGE PROCESS

A ROBUST IRIS LOCALIZATION AND TEXTURE EXTRACTION SCHEME FOR IRIS AUTHENTICATION SYSTEMS

Hayder Najm (Imam Alkadhim University College), Bahaa Kareem Mohammed (Technical Institute Kut), Hala A. Naman (University of Wasit), Hussein Hussein Al Bazar (Arab Open University), Mohammed Salih Mahdi (University of Information Technology and Communications) and Wijdan Rashid Abdulhussien (University of Thi-Qar)

Abstract. Biometrics systems accurately identify and distinguish individuals based on their characteristics. Due to the high accuracy and stability, iris has been widely used in the authentication process of authorized persons. One of the most important processes in developing an iris recognition system is iris segmentation since it has a substantial impact on the accuracy of iris matching. Although there are several influencing factors such as overlapping eyelashes, eyelids, and lighting, it must be the area of the iris that is precisely defined. Several attempts towards robust iris localization and segmentation have been made in light of these challenges. A robust iris localization method based on a circular Hough transform and an active contour model was presented in this study. The precisely extracted iris region, and its distinctive characteristics, are extracted using the GLCM method, depending on different types of images, some of which were captured using near-infrared (NIR) under specific capture conditions. The other part of the pictures was taken with normal visible light (VW). The co-occurrence matrix is used to estimate the Homogeneity, Energy, Contrast, Correlation, and Entropy collection of second-order statistical features. Experimental results on 100 images from CASIA v1, IITDv1, and UBIRIS v1 iris images databases show that our method achieves high accuracy and small time.

Keywords: Data Security, Authentication, Authorization, Active Contour, CHT, CASIA, GLCM, ITTD, UBIRIS

University of Baghdad Campus Navigation and Information Organization Mobile Application

[34] Heba Fadhil (Department of Information and Communication, Al-Khwarizmi College of Engineering, University of Baghdad, Baghdad, Iraq.), Mohammed Kamal (Department of Information and Communication, Al-Khwarizmi College of Engineering, University of Baghdad, Baghdad, Iraq.) and Hussam Saad (Department of Information and Communication, Al-Khwarizmi College of Engineering, University of Baghdad, Baghdad, Iraq.)

Abstract. The large academic University of Baghdad is an institution that needs to address several problematic issues. Due to the spread of this learning institution and the variety of facilities it has, sometimes it may be quite puzzling for learners, faculty, staff and other visitors to identify where to find a particular department or building or any other resource facility. This is especially so since existing information systems may not afford full coverage as well as highly interactive user interfaces to the matter. In order to overcome these challenges, the following application is designed to create a mobile application that specializes in the University of Baghdad Campus Navigation and Information Organization. The solution envisages the creation of an application that is available for download on

smartphones that will allow for easy navigation and obtain the relevant information about the campus. In order to apply this solution, it will be necessary to have maximum information on distances between the buildings, departments' descriptions, and nearby interesting points. The proposed solution will also provide a convenient system of how to get to, for example, a building, a classroom or any other facility on the campus. In addition, the use of the application will allow feasible access to program details, faculty profiles, campus activities, and administrative offices. Using state of the art mobile technologies with an emphasis of user centred design the proposed solution will enable users to move around the campus with ease and efficiency in the manner that will promote togetherness and engagement among the students, lecturers and other members of the University community.

Keywords: Campus Navigation, University of Baghdad, Mobile Application, Information Organization, Cross Platform

PAPER ID: ICCSIT 37

Assessment of Multivariate Prediction Based on Data Fetching Methodology Using Neural Network

Raya Mahmood (Al-Imam Al-Adham University Collage) and Sefer Kurnaz (Altinbas University)

Abstract. This paper uses neural networks in predicting multivariate student's professional identity based on survey result and assessing data fetching methodology to achieve better prediction accuracy under distinct platforms. The majority of educational data mining researchers use logistic regression or decision tree as a classification method in the prediction process which leads to either low accuracy results or over fitting in the predicted results in some cases. On the other hand, selecting data fetching methodology can be deceiving, especially with huge amounts of data, however, the generated prediction results can be misleading if the wrong fetching methodology was used in the wrong platform, considering that most educational institutions store this data on the database and sometimes use cloud platforms. The intended result is to increase prediction accuracy using neural networks, diagnose the best data fetching methodology and storage, and what is the suitable platform used to maintain the intended accuracy. Comparison methodology carried out to clarify the variance in accuracy and running time depending on the selected data source as a comma-separated values (CSV) file or database tables. Moreover, it evaluates the effect of using various platforms on the performance of algorithms such as local computers that use python to carry out the mining process vs. Azure cloud using Azure machine learning studio. The work recorded more than 99.8% accuracy in algorithm performance using CSV file on the local machine against 75% on Azure cloud while fetching data from the database present better accuracy on the cloud.

Keywords: Azure, data mining, machine learning, neural networks, prediction

PAPER ID: ICCSIT 45

STUDY AND ANALYSIS OF A NEW FIVE-DIMENSIONAL HYPER-CHAOTIC SYSTEM

Maryam Thair Alghamazi (Mustansiriyah University, College of Education, Department of Computer Science, Baghdad, Iraq), Sadiq A. Mehdi (Mustansiriyah University, College of Education, Department of Computer Science, Baghdad, Iraq) and Emad I. Abdul Kareem (Mustansiriyah University, College of Education, Department of Computer Science, Baghdad, Iraq)

Abstract. This research presents a novel 5D hyper chaotic system to increase the degree of disorder in the system. The system comprises 10 positive chaotic parameters as well as complex chaotic dynamics properties. The system's basic properties and dynamic behaviour are investigated with the existence of equilibrium points, Lyapunov exponents, chaotic attractor, dissipative properties, symmetry, waveform analysis, Kaplan-Yorke dimensions, Key Space Analyses, bifurcation property, and sensitivity to initial conditions. The new system has 5 Lyapunov exponents in addition to 2 points of unstable equilibrium. According to the study's findings, The Maxim positive Lyapunov Exponent (MLE) and Kaplan-Yorke estimated values are 6.85408 and 4.37292, respectively. The results show that the innovative system exhibits highly complicated, unstable, and unpredictably unstable properties

Keywords: chaotic, five-dimensional, unstable, Lyapunov, waveform analysis, Bifurcation

PAPER ID: ICCSIT 48

EVALUATING THE EFFICACY OF DATA CLUSTERING ALGORITHMS: A COMPREHENSIVE REVIEW OF PERFORMANCE METRICS

Yaser Mahmood (Department of Computer Science, University of Anbar, Ramadi, 31001, Iraq.) and Atheer Bassel (Computer Center, University of Anbar, Al-Anbar 31001, Iraq)

Abstract. Data clustering, a pivotal technique in data analysis, involves grouping data points such that those within a cluster are more similar to each other than to those in other clusters. This review paper explores various performance metrics used to evaluate data clustering algorithms. It discusses the significance of these metrics in different clustering contexts, their limitations, and the challenges in assessing algorithm efficacy. By providing a comprehensive overview of metrics like cluster purity, silhouette score, Davies-Bouldin index, and more, this paper aims to guide researchers in selecting appropriate metrics for their specific clustering problems

Keywords: Data Clustering, Performance Metrics, Algorithm Evaluation, Cluster Purity, Silhouette Score

PAPER ID: ICCSIT 44

A Review on Deep Learning-based Methods for Template Matching.

Mohammed Jasim A. Alkhafaji (Department of Computer Engineering and Information Technology, University of Qom, Qom, Iran), Mohamad Mahdi Kassir (Department of Computer Engineering and Information Technology, University of Qom, Qom, Iran) and Amir Lakizadeh (Department of Computer Engineering and Information Technology, University of Qom, Qom, Iran)

Abstract. Detection of object in images is a never-ending problem in the field of computer vision since it involves many factors that affect the accuracy of detection like minor geometric variations and noise due to various weather conditions. In this paper, to enhance this process several state-of-art approaches like QATM (Quality Aware Template Matching) algorithms supported with Convolutional Neural Networks (CNN) and Kalman filter are proposed. QATM is a recent approach which makes it possible to handle minor changes occurring in the shape or geometric aspects of an object to be detected while CNN integrate continuous measurements with dynamic models for better estimates and reduction on noise plus having learned to extract complex visual features from images which further boosts detection

accuracy as compared with traditional methods. This advantage can at times also prove to be disadvantageous given their tremendous capacity for learning they might become very error-prone when dealing with noisy and cluttered data. Hence, the Kalman filter steps in to further enhance these results by improving the accuracy of detected locations and reducing errors. In this paper, we take an in-depth research on the methods' fusion processes in full especially on how QATM is used and the robustness of this algorithm for extracting initial locations of objects in images and then how they are improved using Kalman filter. How much this influences the test results in terms of detection accuracy and noise reduction and whether such hybrid approach can bring large improvements of performance with respect to object detection applications.

Keywords: Kalman Filter, Template Matching, Image Preprocessing, CNNs, QATM

PAPER ID: ICCSIT 63

PERCEIVED FACTORS AFFECTING MOBILE BANKING CONTINUANCE IN IRAQ

Walaa Hakim (University of Kufa) and Fatina Shukur (University of Kufa)

Abstract. The mobile banking in Iraq marks a significant milestone in the country's financial landscape, bringing modern convenience and accessibility to banking services. The purpose of the research is to investigate the variables that affect users' ongoing intention to use mobile banking apps in Iraq. The study examines how users' intentions to stick with mobile banking applications are influenced by perceived usefulness, perceived ease of use, perceived danger, and trust. It does this by combining the Technology Acceptance Model (TAM) with the trust component. The moderating impact of demographic variables, such as age, on the association between trust and the ongoing intention to use mobile banking apps is also investigated in this study. Our research considers the investigation of many challenges including: security through transactions, data privacy, in addition to addressing concerns about digital literacy and infrastructure development. The study's findings add to our understanding of how developing countries like Iraq are implementing mobile banking.

Keywords: Mobile banking, Technology Acceptance Model (TAM), perceived factors, e-banking

PAPER ID: ICCSIT 67

THE IMPACT OF INTERNET COMFORT ON MOBILE BANKING USAGE BEHAVIOR IN IRAQ

Walaa Alnaseri (University of Kufa) and Fatina Shukur (University of Kufa)

Abstract. Recent advancements in mobile technology have revolutionized the financial sector, offering new avenues for financial institutions to reduce transaction costs and expand their market reach. Mobile banking adoption is primarily driven by migration incentives and service factors, influenced by considerations such as service quality, perceived risk, and security features. Trust, innovativeness, perceived usefulness, and task compatibility are crucial prerequisites for the adoption of mobile banking applications. Segmentation of consumers based on their comfort with mobile internet enhances confidence in message design and aids in targeted market research.

This study focuses on understanding the impact of internet comfort on mobile banking usage behavior in Iraq. With the economy growing rapidly and a rising emphasis on improving ICT infrastructure, it is essential to examine consumer behavior in this evolving landscape. Through a questionnaire survey

conducted with 510 respondents from various regions in Iraq, multivariate statistical analysis was employed to test hypotheses.

The theoretical framework of the study explores the relationship between consumer contentment regarding mobile banking transactions and usage behavior, emphasizing the dimensions of comfort with internet usage and patterns of mobile banking usage behavior. The study reveals the significant influence of comfort with internet usage on mobile banking adoption, shedding light on factors such as ease of internet usage, confidence, satisfaction, anxiety, and contentment.

Keywords: Internet Comfort, Mobile Banking Usage, Decision Tree Algorithm, KNN Algorithm, Naïve Bayes Algorithm, SVM Algorithm

PAPER ID: ICCSIT 22

ENHANCING VIOLENCE DETECTION IN SURVEILLANCE VIDEOS USING DEEP LEARNING TECHNIQUES

Sara Ayad (University of Baghdad) and Yarub Alazzawi (University of Baghdad)

Abstract. Surveillance cameras have been increasingly used in recent years to improve security in both public and private settings. Many organizations continue to engage someone to monitor the cameras, but because human error occurs, the hired individual is more likely to miss some unusual events in the video feeds. It may thus be futile to devote time and effort to monitoring surveillance cameras. On the other hand, a significant number of researchers evaluated surveillance data and proposed a number of approaches for automatically detecting abnormal events. As a result, we a model for detecting odd occurrences in security camera data. In this study, we built a model to extract critical information from each frame of our input stream using a well-known (VGG16). We employ Gamma Correction to improve accuracy, and intend to utilize different Deep Learning models (CNN and RNN) to identify and feature extraction, and then a specialized support vector machine (SVM) architecture to discover anomalous events in our time series dataset. From there, we can raise a detection alert for the situation of a threat, indicating the suspicious activities at an instance of time. Furthermore, unlike previous attempts that mostly focused on hand-crafted datasets, our collection comprised real-time surveillance camera feeds from a variety of themes and environments. The results of the two models were compared, and it was found that the CNN technique gives better accuracy and efficiency in detecting violence compared to the RNN techniques.

Keywords: Violence detection, Convolutional Neural Networks(CNN), Recurrent neural network(RNN), Artificial intelligence, Video features, Support Vector Machine (SVM)

PAPER ID: ICCSIT 19

MULTI-CAMERA SURVEILLANCE SYSTEM FOR VIOLENCE PREDICTION ESTIMATION: A REVIEW

Sara Ayad (University of Baghdad) and Yarub Alazzawi (University of Baghdad)

Abstract. The increasing number of surveillance cameras to watch over human activity necessitates the use of automated systems that can identify violent incidents and other suspicious activity. In an effort to draw in new researchers, the field of computer vision and image processing is actively researching the detection of abnormal and violent behavior. Very few studies from the past have addressed the

application of intelligent video analytics to the identification of suspicious objects. In this review paper, we make the violence detection significantly faster by focusing on the important topic of violence recognition and detection in surveillance videos. The numerous approaches and strategies that have been put forth by numerous researchers in recent years for identifying violent or unusual activity from surveillance footage are reviewed in this research study. For every category, techniques for object detection and feature extraction are also explained. Additionally, covered are dataset and video features that support the recognition process. There has been discussion of the overall research findings, which will support the researchers in their further work in this area.

Keywords: Violence detection, surveillance camera, Artificial Intelligence, Video features, fight detection, video surveillance

PAPER ID: ICCSIT 23

DEEP_IMAGE: AUTOMATED IDENTIFICATION OF BACTERIA BASED ON DEEP LEARNING MODEL

Wasan Maddah Alaluosi (Ministry of Education), Zainab N. Al-Qudsy (University of Information Technology and Communications), Maad M. Mijwil (Baghdad College of Economic Sciences University), Ahmed Adnan Hadi (Al-Mustaqbal University) and Mohammad Aljanabi (Imam Ja'afar Al-Sadiq University)

Abstract. Accurate Classification of bacteria plays a crucial role in microbiology and beyond. It helps to identify infectious agents during epidemiological investigations, food safety monitoring, and detection of biological threat agents. Convolutional Neural Network (CNN) is a deep learning technique that has proven reliable in the field of Classification of medical and biological diseases. In this study, CNNs are utilized to develop a bacterial classification system. Within this system, Classification is subjected to several modifications before the ResNet method is used in order to identify the kinds of Bacteria from among sixteen different classes of bacterial images. The model was fine-tuned by training only the last two layers of the pre-trained ResNet101V2 network, which significantly improved the performance. A large-scale dataset and confusion matrix were used to evaluate the model's performance. The experimental results demonstrate that the accuracy rate reached a peak of 98.66%. Moreover, the suggested approach enhances the advancement of automated diagnostic tools for bacterial pictures that surpass the present state-of-the-art models and provide the groundwork for future enhancements in bacterial image classification utilizing CNNs.

Keywords: ResNet, Bacteria images, Convolution neural network, Classification, Deep learning

PAPER ID: ICCSIT 25

Designing Green Software for the Management of Sensitive Data in Organizations

Yasmin Makki Mohialden (Mustansiriyah University), Nadia Mahmood Hussien (Mustansiriyah University), Rana Ali Abttan (University of Baghdad), Maad M. Mijwil (Baghdad College of Economic Sciences University), Mohammad Aljanabi (Imam Ja'afar Al-Sadiq University) and Mostafa Abotaleb (South Ural State University)

Abstract. Organizations have to protect sensitive data and be environmentally conscious in the digital age. Conventional data management lacks security and sustainability, resulting in higher energy and operating costs. The research proposes new green data management software that emphasizes energy efficiency and sustainability. This system uses energy-efficient algorithms, sustainable storage, and strong security to reduce data management costs and environmental effects. Data security, energy efficiency, storage efficiency, and neural processing are all discussed. It asserts to enhance data security while decreasing energy usage through carefully planned development, implementation, and evaluation, enabling organizations to implement sustainable data management methods.

Keywords: Green software, Sensitive data, Energy efficiency, Sustainable data management, Data storage optimization

PAPER ID: ICCSIT 26

MICROCRYPT: HIGH-EFFICIENCY HASHING FOR NEXT-GENERATION IOT DEVICES

Shatha H. Jafer Al-Khalisy (University of Technology), Wafaa M. Salih Abed (City University Ajman), Adil M. Salman (Baghdad College of Economic Sciences University), Ghada Emad Al-Kateb (University of Information Technology and communication), Mohammed Aljanabi (Imam Ja'afar Al-Sadiq University) and Maad M. Mijwil (Baghdad College of Economic Sciences University)

Abstract. The Internet of Things (IoT) is growing quickly and connecting more devices than ever before. This has made it more important to improve security protocols, especially cryptographic hash functions that work in places with limited computing, storage, and energy resources. This paper presents MicroCrypt, an innovative hash function developed specifically to address the unique requirements of IoT applications. It outperforms traditional hash functions such as SHA-256, BLAKE2s, SHA-3, and MD5 in several key performance metrics, including processing speed, memory efficiency, and energy consumption. Our comprehensive comparative analysis indicates that MicroCrypt reduces processing time by about 40%, decreases memory usage by nearly 30%, and cuts energy consumption by approximately 35% when compared with the most efficient of these conventional functions. Additionally, MicroCrypt enhances security features, offering robust resistance against a variety of cryptographic attacks, which ensures exceptional data confidentiality and integrity. These improvements make MicroCrypt an excellent prospect for ongoing research and potential standardisation in post-quantum cryptography within IoT environments. The findings of this study underline MicroCrypt's significance as a groundbreaking advancement in cryptographic technology, specifically tailored to meet the evolving demands of next-generation IoT devices. This aligns with the critical need for secure, efficient, and scalable security solutions in the increasingly complex IoT landscape.

Keywords: Cryptographic, Hash Function, Quantum Resistance, Encryption, MicroCrypt

SUSTAINABLE LEAF PLANT DISEASE BASED ON SALP SWARM ALGORITHM FEATURE SELECTION

Hamsa E. Mahmood (Department of Computer Science, University of Technology), Yossra H. Ali (Department of Computer Science, University of Technology) and Tarik A. Rashed (Computer Science and Engineering, University of Kurdistan Howler, Erbil, KR, Iraq)

Abstract. Sustainable plant protection and the economy of plant crops worldwide depend heavily on the health of agriculture. In the modern world, one of the main factors influencing economic growth is the quality of agricultural produce. The need for future crop protection and production is growing as disease-affected plants have caused considerable agricultural losses in several crop categories. To do this, crop yield must be increased while preserving food quality and security and having the most negligible negative environmental impact. To overcome these obstacles, early discovery of satisfactory plants is critical. The use of Advances in Intelligent Systems and information computer science effectively helps find more efficient and low-cost solutions. This paper proposed a multiclass classification model that aims to detect diseases in three types of fruit using the leaves plant images dataset. These three types of fruit are (Apple, Cherry, and Strawberry) where Apples have three disease dataset categories (Leaf Scorch, Apple Scab, Black Rot, and Cedar Rust) as well as healthy apple dataset, Cherry have Powdery Mildew disease dataset category and healthy dataset, and Strawberry have leaf Scorch disease dataset category and healthy dataset. These datasets are based on the PlantVillage dataset.

These multiclass classifications need several steps of the processing; the first step is preprocessing the dataset by resizing all images to the same size, segmentation, and removing noise; then, feature extraction from colour and texture features; the next step is feature selection to find optimal features by using the Salp Swarm algorithm (SSA); and classification by using machine learning models (Random forest), (CatBoost), and (XGBoost). In the final step, evaluation criteria were used to select several matrices, such as Accuracy, precision, recall, F1-score, and RUC- AUC.

Keywords: Plant Disease, Features Extraction, Features selection, Salp Swarm Algorithm (SSA)

EVALUATION OF THE ECONOMIC VIABILITY OF HYBRID SOLAR, WIND, AND GRID CONNECTED IN SOMALIA, CASE STUDY; JAMHURIYA UNIVERSITY OF SCIENCE AND TECHNOLOGY

Abdulaziz Ahmed Siyad (Jamhuriya University of science and Technology), Sumayo Mohamed Ahmed (Jamhuriya University of science and Technology), Abdinasir Mohamed Jama (Jamhuriya University of science and Technology), Abdirahman Ali Elmi (Jamhuriya University of science and Technology), Abdinasir Farah Yusuf (Jamhuriya University of science and Technology), Abdillahi Mohamed Ibrahim (Jamhuriya University of science and Technology) and Yakub Hussein Mohamed (Jamhuriya University of science and Technology)

Abstract. The integration of renewable energy sources, such as solar and wind power, into the energy mix of developing countries presents a promising avenue for sustainable development. This study

investigates the economic viability of a hybrid solar, wind, and grid-connected energy system in Somalia, specifically focusing on Jamhuriya University. The aim of the research is to evaluate the potential economic advantages and feasibility of integrating renewable energy sources with the existing grid infrastructure. The analysis includes a comprehensive assessment of the cost-effectiveness, return on investment, and potential energy savings associated with the proposed hybrid system. Factors such as solar and wind resource availability, electricity demand profiles, and financial considerations are taken into account during the evaluation. The study's findings provide valuable insights into the economic viability and sustainability of hybrid energy systems in Jamhuriya University of Science and Technology. The results also highlight the economic advantages, environmental benefits, and potential challenges associated with the adoption of renewable energy solutions in the region, thereby offering a blueprint for other institutions and communities grappling with energy challenges.

Keywords: Photovoltaic, Economic viability, Energy Transition, Economical analysis, Hybrid PV-wind-grid tied system

PAPER ID: ICCSIT 33

Grad Guide : Intelligent Application to Assist 6th Grade Students in Filling Out Iraqi Universities Application Forms

Heba Fadhil (Department of Information and Communication, Al-Khwarizmi College of Engineering, University of Baghdad, Baghdad, Iraq.), Abdullah Jamal (Department of Information and Communication, Al-Khwarizmi College of Engineering, University of Baghdad, Baghdad, Iraq.) and Suhaib Safaa (Department of Information and Communication, Al-Khwarizmi College of Engineering, University of Baghdad, Baghdad, Iraq.)

Abstract. Abstract. Smartphones provide users with quick access to online information sources, simplifying the process of searching for information and keeping up with current events. This accessibility benefits both adults and children, particularly those aged 13-24. High school graduates often face confusion and stress when applying to universities and institutes. Many students are uncertain about which colleges match their grades, leading them to choose programs that do not align with their interests or goals. This paper introduces a mobile application designed to assist secondary school students in applying to Iraqi universities and institutes by selecting colleges or departments that correspond to their cumulative averages. The primary objective of this application is to ensure that students are aware of the departments that suit their academic performance. The application streamlines the search for colleges and institutes using machine learning algorithms. When a student enters their GPA and other features, the app generates a list of over 10 colleges and institutes that match the student's academic profile, facilitating an optimal choice.

Keywords: Mobile Application, High school graduates, GPA, Machine Learning, K- means

PAPER ID: ICCSIT 51

DESIGN AN EFFECTIVE MODEL FOR PLANT DISEASES DETECTION AND CLASSIFICATION

Nedaa Jaber (University of Thi-Qar) and Walaa Khshlan (University of Thi-Qar)

Abstract. Smart agriculture is crucial in ensuring food production by employing advanced technologies to monitor and manage plant health. Accurate detection of diseases affecting plants is crucial for ensuring the long-term sustainability of agriculture. This paper presents an intelligent plant diseases detection system using a modified EfficientNetB2 model, incorporating additional dense layers, activity_regularizer, bias_regularizer, and kernel_regularizer techniques. The model undergoes training using PlantVillage dataset comprising 38 classes of plant leaves. The study achieved impressive results, with an accuracy of 97.70. The results clearly indicate the efficacy of the suggested approach, highlighting its capacity to make a substantial contribution to intelligent agricultural practices. The method facilitates early disease identification, empowering farmers to implement preventive measures and foster sustainable crop farming.

Keywords: Smart agriculture, Plant diseases, Deep learning, EfficientNetB2

PAPER ID: ICCSIT 54

EXPLORING THE EFFECTIVENESS OF LIBLINEAR LEARNING TECHNIQUE IN MULTI-CLASS IMBALANCED DATA CLASSIFICATION

Osamah Mohammed Alyasiri (School of Computer Sciences, Universiti Sains Malaysia, Penang 11800, Malaysia) and Yu-N Cheah (School of Computer Sciences, Universiti Sains Malaysia, Penang 11800, Malaysia)

Abstract. Solving large-scale classification problems is essential in various applications, such as text classification. Classifiers used in multi-class imbalanced text classification often struggle with biases towards majority classes, poor performance on minority classes due to overfitting, and difficulties in handling rare classes. Challenges also arise from inadequate feature representation and the inherent noise and variability in text data, complicating class distinction. Therefore, LIBLINEAR models, known for their effectiveness in large, sparse data settings with numerous instances and features, have become a promising learning technique. These models inherit several features from the widely-used LIBSVM library, including simple usage, comprehensive documentation, and an open-source license. In this study, LibLINEAR with L2-regularized L2-loss support vector classification (dual) and LibLINEAR with L2-regularized logistic regression (dual) were employed as classifiers. Their performance and capabilities were examined across 19 benchmark text collections. The proposed models demonstrated efficacy, achieving an average accuracy of 88.11, 89.13%, and 87.99, 88.92% in F1-measures across all datasets respectively. Moreover, when the performance was compared with three prominent classifiers—Multinomial Naive Bayes (MNB), K-Nearest Neighbors (K-NN), and Decision Tree (DT)—the results further demonstrated the effectiveness of the proposed models.

Keywords: Text Classification, Multi-Class Imbalanced Dataset, LibLINEAR, SVM, LR

A DCNN-BILSTM APPROACH IS USED TO EVALUATE ARABIC HANDWRITTEN POETRY RESPONSES AUTOMATICALLY.

Huda Sabah Shuker (University of Technology), Raheem Abdul Sahib (University of Technology) and Abdul Monem S. Rahma (University of Technology)

Abstract. This research proposes a unique deep learning-based technique for automatically evaluating students' handwritten responses to Arabic poetry poems. The proposed system employs a deep convolutional neural network (DCNN) architecture, bidirectional Long Short-Term Memory (LSTM) networks, and a Connectionist Temporal Classification (CTC) loss function. This design successfully extracts characteristics from handwritten characters and collects sequential information within the replies, allowing for a more thorough and accurate assessment of the students' comprehension and interpretation of the poetry. The system shows good results in recognising and transcribing handwritten characters, even with variances in writing styles and picture quality. Furthermore, the approach efficiently captures sequential information within the replies, allowing for a more thorough assessment of the students' comprehension and interpretation of the poetry. This technique has the potential to considerably increase the efficiency and impartiality of evaluation in educational settings. Future work will focus on significantly enhancing the system's accuracy and resilience, investigating other deep learning architectures, including new features, and increasing the training dataset.

Keywords: Connectionist Temporal Classification (CTC), Long Short-Term Memory (LSTM), deep convolutional neural network (DCNN)

INTEGRATING FACENET AND EXTREME LEARNING MACHINES FOR ENHANCED FACE IDENTIFICATION: ADDRESSING REAL-WORLD CHALLENGES WITH ADVANCED IMAGE PROCESSING TECHNIQUES

Abdul Monem S.Rahma (Al-Maarif University college), Omar A. Dawood (University of Anbar, College) and Areej A. Abed (University of Anbar, College)

Abstract. Face identification forms an important area of computer vision due to its application in many real-time applications related to the security and surveillance of law enforcement agencies. Deep learning algorithms have revolutionized building face identification systems with high accuracy and speed. There is a dire need for systems that achieve more reliability and can handle a diverse range of scenarios. This work uses a junction of FaceNet, a convolutional neural network (CNN)-based model for feature extraction, and extreme learning machines (ELM) to form a face identification system. The projected performance of the proposed system is expected to outperform that of the existing systems in terms of accuracy and resilience. The improved performance of the proposed systems is rooted in FaceNet and ELM, which can capture intricate facial features and patterns accurately. The ELM runs very fast with a single hidden layer feedforward neural network. Extensive experiments were conducted on the Youtube-faces dataset, and images were captured in real time. The proposed method had a recognition accuracy of 99.1 percent, a precision of 98.5 percent, a recall of 97.8 percent, and an F1-score of 98.1 percent. Further, we have also applied pruning and quantization to compress the FaceNet+ELM model for its efficient performance on low computational power devices. Pruning reduces

redundant weights and neurons, while quantization converts parameters from 32-bit to 8-bit, greatly reducing the model size and increasing the inference speed.

Keywords: Identity Verification, Face identification, FaceNet, Extreme Learning Machines

PAPER ID: ICCSIT 71

MITIGATION OF TRANSPORT-LAYER BASED VULNERABILITIES IN END-TO-END ENCRYPTION GROUP CHAT PROTOCOLS

Khalid Ayed (Department of Computer Sciences, College of Sciences, University of Al Maarif) and Omar Dawood (Department of Computer Science, College of Computer Sciences and Information Technology, University of Anbar)

Abstract. Transport Layer Security's (TLS) nature is to decrypt data at a secure endpoint, process it as needed, and then re-encrypt it for delivery to the next transmission path point. This causes the End-to-End encryption method in group chats to break when an administrator performs an action. This proposal introduces a secure cryptographic protocol for group chat management operations in End-to-End encryption environments, enhancing privacy, integrity, and authentication between group members and the central server. It combines symmetric and asymmetric encryption with the Double Ratchet algorithm and One-Time X3DH. Admin operations are encapsulated in a unique "encrypted_modify_concatenated_packet," ensuring only group data is updated on the server the key updates distributed by the group admin. This robust, scalable design adapts to various group chat environments especially signal-based, providing a significant advancement in secure group communication protocols and fully End-to-End encryption between admin, server and members

Keywords: Cryptography, Signal, End-to-End Encryption, Group Chat, Transport-Layer

PAPER ID: ICCSIT 72

A NEW TECHNIQUE FOR VIDEO WATERMARKING WHICH UTILIZES FACIAL FEATURES AND GREY WOLF OPTIMIZATION

Hassan Raisan Hussein (University of Technology), Abeer Salim Jamil (Al-Mansour University College) and Nidaa Flaih Hassan (University of Technology)

Abstract. With the advancement of multimedia technologies, the importance of digital video watermarking technology in enforcing copyright has been increasingly recognized. This paper presents a novel technique to embed video watermarks in facial features using Swarm Optimization algorithms. Unlike previous approaches that rely on manual selection or generic regions, the proposed technique employs Multi-task Cascaded Convolutional Neural Networks (MTCNN) for accurate face detection, followed by the Grey Wolf Optimizer (GWO) to identify optimal facial features for watermark embedding. This ensures the watermark meets the essential criteria of robustness, imperceptibility, and capacity. The watermark embedding process utilizes the Least Significant Bit (LSB) method. Embedding the watermark in the facial region offers semantic advantages, as potential attackers are less likely to tamper with these critical regions to preserve the visual integrity of the face. The locations of host pixels selected by GWO are unique and unpredictable, differing from frame to frame, thus complicating attackers' attempts to pinpoint these locations. Experimental results demonstrate significant

imperceptibility, with a Peak Signal-to-Noise Ratio (PSNR) averaging 40.895685, a Structural Similarity Index Measure (SSIM) of 0.997221, indicating high visual similarity, and an Entropy value of 7.302416; this makes it difficult to perceive or predict the watermark. Despite GWO's randomness, results across frames remained stable. Also, the technique shows minimal degradation in quality, even with larger watermark embeddings, thus proving its reliability and effectiveness..

Keywords: Video Watermarking, Multi-task Cascaded Convolutional Neural Networks (MT_CNN), Swarm Intelligence (SI), Grey Wolf Optimizer (GWO), Facial Features, Face Detection

PAPER ID: ICCSIT 09

AN OPTIMIZE CANNY ALGORITHM WITH TRADITIONAL MACHINE LEARNING FOR EDGE DETECTION ENHANCEMENT

Russel Kareem (Computer Science Department, College of Science, Al-Nahrain University) and Zainab Sultani (Computer Science Department, College of Science, Al-Nahrain University)

Abstract. In Computer vision and image processing, edge detection is a fundamental aspect, and despite the development of computer vision, edge detection still represents a major challenge because of the complexity and variability of real-world images. Canny algorithm is powerful in detecting edges; however, it is sensitive to noise, and in result may produce weak edges. Use of machine learning algorithms have significantly improved the performance of edge detection techniques. In this paper, an improved canny edge detection algorithm is proposed, by replacing gaussian filter with bilateral filter. Also, a new approach for estimating canny algorithm thresholds has been developed using the Flower Pollination algorithm. Subsequently, the improved canny algorithm with machine learning model were integrated to enhance edge detection accuracy. The performance of the improved algorithm was evaluated using 50 images from the Berkeley Computer Vision dataset. The experiment results show that the enhanced algorithm is able to detect edges more accurately than the traditional algorithm for some images.

Keywords: Machine Learning, Edge Detection, Canny algorithm, Optimization, Flower Pollination

PAPER ID: ICCSIT 39

THE CHALLENGES OF ARTIFICIAL INTELLIGENCE AND DEEP LEARNING WITH ARABIC GRAMMAR (NAHW)

Imad Farhan (Imaml Aldham University) and Saadi Sharqi (University of Anbar)

Abstract. This research is aimed at surveying the Arabic grammar situation and its future in view of the recent technology and artificial intelligence developments, highlighting some of the ways to use these techniques to improve teaching Arabic grammar and process it automatically, and thus this problem serves as an opportunity for investigating the difficulty that confronts Arabic grammar at a time when technology is rapidly transforming by assessing how well AI can be applied on this language with all its intricacies. The research intends to explore possibilities and challenges that modern technologies and artificial intelligence have in developing Arabic grammar, with a view to suggesting possible solutions hence automatic learning of teaching Arabic grammar. What are useful insights for improving teaching or learning Arabic based on modern technologies and AI? Consequently, the researcher has used descriptive analytical approach where he discussed contemporary state of affairs of Arabic grammar

through the light of new technologies and artificial intelligence while reviewing a number of previous studies conducted in such areas as innovation generation. The themes that will be addressed by this study include: Modern techniques in natural language processing; reviewing most prominent approaches deployed in natural language processing; Communicating challenges related to using artificial intelligence techniques on Arabic grammar; Give examples of successful applications of artificial intelligence software in Arab grammar then discuss what lies ahead for Arabic grammer regarding current trends in technological changes, then conclude by outlining likely developments which can take place within the area. The study is expected to end up with a range of outcomes indicating large potentials available due to modern technologies availability along with AI impact estimation capability toward improved enhancement within developmental prospects among other things. In addition, it will suggest certain issues that need to be explored further like how can educational programs based on artificial intelligence help develop a student's ability to learn languages naturally? How can we adapt existing algorithms for processing Arabic language texts within their grammatical features? And finally

Keywords: Artificial Intelligence, Deep Learning, Arabic Grammar, Natural Language Processing, Machine Learning

PAPER ID: ICCSIT 01

INTELLIGENT MATH TUTOR CHATBOT

Yasmin Mohialden (Mustansiriyah University) and Ahmed Jaber (Mustansiriyah University)

Abstract. With The Evolving Landscape Of Education And The Increasing Complexity Of Mathematical Concepts, The Intelligent Math Tutor Chatbot Study Seeks To Address The Educational Needs Of Students. Students Want A Personalized, Interactive Math Education More Than Ever, Propelling The Initiative. Students Who Need Help Comprehending Limits And Derivatives Can Use The Python Chatbot, Constructed Using Flask, Plotly, And Sympy.

The Chatbot Provides Real-Time Computations, Graphical Representations, And A User-Friendly Interface To Meet The Demand For Creative Educational Solutions. The Idea Emphasises Personalised Learning By Asking Users To Provide Their Names. This Conversational Interface Helps Users Navigate Complex Mathematical Inquiries With Detailed Explanations On The Chatbot.

Plotly Makes Interactive Graphs, Improving Mathematics Visualization. Since Sympy Is A Symbolic Mathematics Library, The Chatbot Can Calculate Accurately And Meaningfully To Answer User Questions. Flask, The Web Framework, Provides A Smooth, User-Friendly Interface For All Ages And Backgrounds.

The Intelligent Math Tutor Chatbot Study Reflects The Move Toward New Educational Technology And Strives To Connect Traditional And Cutting-Edge Learning Approaches. This Chatbot Uses Flask, Plotly, And Sympy To Provide An Engaging Learning Experience That Deepens Mathematical Comprehension. The Study Shows How Conversational Interfaces May Change Mathematical Instruction.

Keywords: chatbot, Personalized Learning, Math Visualization, Symbolic Computations, Interactive Math Education

A REVIEW OF THE ROLE OF TECHNOLOGY IN ENHANCING THE CAPABILITIES OF GIFTED PEOPLE IN YOUTH SCIENTIFIC TALENT PROGRAMS IN THE GENERAL DIRECTORATE OF SCIENTIFIC WELFARE

Ahmed Saad Elewi (Director General, Ministry of Youth and Sport) and Zena Mohammed Faris (Directorate of Scientific Welfare, Ministry of Youth and Sport)

Abstract. The study aimed to identify the technology used in the programs of the Directorate of Scientific Welfare and its role in discovering and developing the abilities of Talents students in the scientific field, as the Scientific Welfare Directorate plays a pivotal role in caring for the Talents and developing their scientific abilities through its various programs. The importance of the study comes from realizing the challenges facing some talent programs, such as the difficulty of some using technology and weak infrastructure. Accordingly, the Scientific Welfare Directorate took a strategic step to employ technology in its simplest form to implement its programs, in line with reality and the needs of talents people. The study showed that the Scientific Care Department achieved a qualitative leap in its programs after relying on technology. It has moved from local programs limited to Baghdad Governorate, benefiting 9,921 beneficiaries, to comprehensive national programs covering all Iraqi governorates and attracting more than 112 thousand beneficiaries. This expansion has made it possible to discover and nurture more talented people in various scientific fields, through the implementation of a variety of interactive programs implemented using technology, such as scientific competitions, scouting programs, virtual debates, and training workshops. This study emphasized the importance of the role of technology in the programs of the Directorate of Scientific Welfare and the discovery and development of the capabilities of talents students in the scientific field. The study provides recommendations for developing the effective use of technology in these programs.

Keywords: Scientific Welfare Directorate, Talents, Youth Scientific Talent, Technology Development

اللجان:

اللجنة العليا المشرفة على المؤتمر

1. ا م د صلاح الدين فليح / كلية الامام الاعظم
2. ا. م. د سيف علي عبدالرضا / جامعة واسط
3. د. احمد سعد عليوي /وزارة الشباب والرياضة -دائرة الرعاية العلمية

اللجنة العلمية

1. ا د زياد حسين صالح/جامعة تكريت // رئيسا
2. ا د ضياء شهيد صبر/ جامعة واسط
3. أ.د قاسم محمد حسين / كلية الكنوز الجامعة
4. ا د محمد القسنطيني/جامعة صفاقس
5. أ.م.د سنان عدنان ديوان / جامعة واسط
6. ا م د مصطفى عبدالغفور محمد / كلية الامام الاعظم
7. ا م د محمد خميس خليل / الجامعة العراقية
8. ا م د عمر حسين سلمان /الجامعة العراقية
9. ا م د احمد حسين علي / الجامعة العراقية
10. ا م د احمد شاكر عبدالرضا/ جامعة واسط
11. ا م د علي فاهم نعمة / جامعة واسط
12. ا م د بالكلن اي خان / جامعة اليونيماب ماليزيا
13. ا م د اميزا امير/ جامعة اليونيماب ماليزيا
14. ا م د معن نواف عبود /كلية الامام الاعظم
15. أ.م. عبدالهادي محمد دخيل / جامعة واسط
16. ا م د زهراء عدنان عبدالكريم /كلية الامام الاعظم
17. ا.م.د. سحاب ضياء محمد/ كلية اليرموك الجامعة
18. ا.م.د. عدي علي احمد/مكتب وكيل الوزارة لشؤون البحث العلمي

19. م د نزار صالح عبد/كلية الامام الاعظم
20. ا م د بشار طالب حميد /جامعة ديالى
21. أ.م.د. الاء حمزة عمران/مدير قسم الشؤون العلمية دائرة البحث والتطوير
22. د. سعد احمد ذياب /وزارة التربية
23. د.عمار عواد مطلق /وزارة التربية

اللجنة التحضيرية

1. ا.م.د. زهراء عدنان عبدالكريم // رئيسا
2. أ.م.د. مكّي وليد عبدالكريم /كلية الامام الاعظم
3. ا.م. حسين خضر إبراهيم / جامعة واسط
4. ا.م. احمد حافظ إبراهيم / جامعة واسط
5. ا.م. عبد الهادي محمد ادخيل / جامعة واسط
6. م.د. احمد رعد عبد الحسين / جامعة واسط
7. م.د. ندى قاسم محمد /وزارة الشباب والرياضة
8. م. اوس سعد شوكت/كلية الامام الاعظم
9. م.مهند غازي ياسين / الجامعة العراقية
10. م.م. زينة محمد فارس / وزارة الشباب والرياضة
11. م.م. زينب مهند عيسى / جامعة واسط
12. م.م. هند علي عبدالحسن / جامعة واسط
13. م.م. احمد علاء محسن / جامعة واسط
14. م.م. بسمة ابراهيم حسن /وزارة الشباب والرياضة

لجنة النشر

1. أ.م.د. محمد خميس خليل / الجامعة العراقية // رئيسا
2. أ.م.د. مصطفى عبدالغفور محمد / كلية الامام الاعظم
3. م.مهند غازي ياسين / الجامعة العراقية

اللجنة الاعلامية

1. م.د ندى قاسم محمد /وزارة الشباب والرياضة // رئيسا
2. أ.م مصطفى محمود عكاوي / كلية الامام الاعظم
3. م.د مروان حامد /كلية الامام الاعظم
4. م. محمد إبراهيم مهدي/ جامعة واسط
5. م.عامر خضر جرجس/كلية الامام الاعظم
6. م. ياسين احمد محمد داود /كلية الامام الاعظم
7. م.م مروان محمد امين/كلية الامام الاعظم
8. م.م اسامة محمد الياسري / جامعة الفرات الاوسط
9. علي فضيلة الشمري / جامعة واسط
10. حلا خالد /كلية الامام الاعظم
11. م.م بسمة ابراهيم حسن /وزارة الشباب والرياضة
12. علي عبدالغفور اسعد

اللجنة الاعلامية

1. م.م بكر حسين علوان / كلية الامام الاعظم
2. م.م زينب مهند عيسى / جامعة واسط