**List of participants (name, title and abstract)**

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| No. | Name | Title | Abstract |
| 1 | Agbolade Olalekan | 3-Dimensional facial expression recognition in human using multi-points warping | Expression in H-sapiens plays a remarkable role when it comes to social communication. The identification of this expression by human beings is relatively easy and accurate. However, achieving the same result in 3D by machine remains a challenge in computer vision. This is due to the current challenges facing facial data acquisition in 3D; such as lack of homology and complex mathematical analysis for facial point digitization. This study proposes facial expression recognition in human with the application of Multi-points Warping for 3D facial landmark by building a template mesh as a reference object. This template mesh is thereby applied to each of the target mesh on Stirling/ESRC and Bosphorus datasets. The semi-landmarks are allowed to slide along tangents to the curves and surfaces until the bending energy between a template and a target form is minimal and localization error is assessed using Procrustes ANOVA. By using Principal Component Analysis (PCA) for feature selection, classification is done using Linear Discriminant Analysis (LDA). The localization error is validated on the two datasets with superior performance over the state-of-the-art methods and variation in the expression is visualized using Principal Components (pcs). The deformations show various expression regions in the faces. The results indicate that Sad expression has the lowest recognition accuracy on both datasets. The classifier achieved a recognition accuracy of 99.58 and 99.32% on Stirling/ESRC and Bosphorus, respectively. The results demonstrate that the method is robust and in agreement with the state-of-the-art results. |
| 2 | Sina Abdipoor | Meta-heuristic approaches for the University Course Timetabling Problem | Course timetabling is an ongoing challenge that universities face all around the world. This combinatorial optimization task involves allocating a set of events into finite time slots and rooms while attempting to satisfy a set of predefined constraints. Given the high number of constraints and the large solution space to be explored, the University Course Timetabling Problem (UCTP) is classified as an NP-hard problem. Meta-heuristic approaches have been commonly applied to this problem in the literature and have achieved high performance on benchmark datasets. This survey paper provides a comprehensive and systematic review of these approaches in the UCTP. It reviews, summarizes, and categorizes the approaches, and introduces a classification for hybrid meta-heuristic methods. Furthermore, it critically analyzes the benefits and limitations of the methods. It also presents challenges, gaps, and possible future work. |
| 3 | Bilal Ahmed Mohammed | Hybrid Harmony Search Algorithm with Single-based Metaheuristics for the Berth Allocation Problem | Berth Allocation Problem (BAP) is one of the renowned challenging combinatorial optimization problems that plays a crucial role in maritime transportation systems. The aim is to allocate berth location and service time for a certain number of ships in such a way that all BAP constraints are respected. BAP is classified as non-deterministic polynomial-time hard (NP-hard) problems, which is difficult to solve for optimality in a reasonable amount of time. Many metaheuristic algorithms have been developed to solve this problem and yet, most of these algorithms have some drawbacks such as: some suffers from being of complex structure, thus they are not easily enhanced. Also, some of them have weak ability to explore the search space (struggle to escape from local optima). Considering the importance of the BAP on the one hand, and the limitation of the existing algorithms on the other hand, the need to either enhance the existing algorithms or utilize a new one to tackle the BAP is still necessary. Harmony Search Algorithm (HSA) is one of the recent population-based metaheuristic algorithms that is inspired by modern nature. The HSA has confirmed its ability to tackle various difficult combinatorial optimization problems such as university course timetabling, vehicle routing and many others. However, as far as we are concerned, it has never been applied to solve the BAP problem (Thus, it is supposed there is a satisfactory chance that HSA could perform well for the BAP). This motivates us to investigate the performance of HSA in solving the BAP. This study aims to enhance the performance of the HSA by hybridizing the HSA with single-based metaheuristics to tackle the BAP. These single-based metaheuristics are used inside the HSA to enhance the exploitation ability of HSA and to produce good quality solutions. The performance of the hybrid HSA is tested using the BAP benchmark (I3 dataset) and compared with other latest algorithms found in the literature. The trial outcomes evidenced that the HSA is promising, competitive, and that it has surpassed some other algorithms that have solved the same dataset. The results matched the best-known results in all instances. The results also prove the suitability and applicability of the hybrid HSA in tackling the BAP. |
| 4 | WAN MOHD HAFFIZ BIN MOHD NASIR | Big Data Analytics Quality Factors in Enhancing Healthcare Organizational Performance | The advancement of Big Data Analytics (BDA) has aided numerous organizations in effectively and efficiently adopting BDA as a holistic solution. BDA implementation in healthcare can provide an end-to-end solution with better information value insights However, BDA quality assessment has not yet been fully addressed; therefore, it is necessary to identify essential BDA quality factors to assure the enhancement of organizational performance, particularly in the healthcare sector. Hence, the goals of this study are to recognize and analyze the determining factors of BDA quality as well as to suggest a conceptual model for enhancing the performance of healthcare organizations via BDA quality assessment. The proposed conceptual model is based on a related theoretical model and previous research on BDA quality through a systematic literature review. The findings of this study were to develop a conceptual model that is proposed in line with the twelve-research hypothesis and may offer a better assessment quality model to improve the performance of healthcare organizations. The results of this study have confirmed and validated nine BDA quality factors, which consist of reliability, accuracy, completeness, timeliness, format, accessibility, usability, maintainability, and portability. These factors are commensurate with the research model, while user satisfaction mediates the relationship between BDA quality (BDAQ) and healthcare organizational performance. Further, this study will come out with e-BQAS, which is a prototype for BDAQ assessment that will assist users in evaluating the quality factors throughout BDA development and implementation in healthcare organizations. |
| 5 | Hamza smadi | Transfer Learning with Convolutional Neural Networks for Brain Tumor Classification in Multi-sequence MRI: A Systematic Review (2018-2023) | This systematic review critically evaluates the application of transfer learning (TL)-based convolutional neural network (CNN) architectures in the classification and diagnosis of brain tumors using multi-sequence magnetic resonance imaging (MRI) from 2018 to 2023. Through comprehensive searches in databases such as Science Direct and pubmed, 22 relevant studies were identified and analyzed, focusing on the most recent advancements in TL techniques leveraging cnns for brain tumor MRI classification. The findings predominantly emphasize the efficacy and superiority of pre-trained CNN architectures in this domain, as validated by performance metrics, including accuracy, AUC, sensitivity, specificity, and F1 score. While demonstrating the potential of TL-based CNN models for enhancing diagnostic precision, this review also underscores challenges, particularly related to lack of data necessitating ongoing research to optimize these models for broader clinical application. |
| 6 | Niloofar Bozorgvar | Ecology Simulator in Precision Biodiversity | In the face of rapid environmental changes and increasing threats to ecosystems, there is a growing need for innovative tools and technologies to comprehend and manage ecological systems. Ecological Simulators are innovative tools that enable us to analyze, predict, and simulate ecosystem dynamics. The Precision Biodiversity (PBD) and Ecological Simulator represent pioneering advancements in our approach to understanding and managing intricate ecological interactions. In this research, we offer an exploration that merges two vital facets: the practical advantages of the simulator and the broader context of its significance in advancing ecological research and sustainable resource management. We delve into the conceptual framework of the PBD and Ecological Simulator, explore its underpinning principles, and highlight its potential contributions to advancing ecological research and sustainable resource management. This advanced tool holds potential for sustainable forestry techniques and offers a guide for balancing ecological preservation with commercial objectives in the management of forests. |
| 7 | Nabila Wardah Zamani | Framework for Precision Biodiversity | Digitalization and the Internet of Things(iot) can be used to understand and gain knowledge of precision biodiversity. It's like a virtual lab where we can test different ideas to see what's best for biodiversity. This paper proposes a framework of precision biodiversity and ecology simulator to make smart decisions about biodiversity that can be applied to foresters and scientists |
| 8 | Ghodratollah Solimanian | Precision Agriculture through Digital Twins: Real-time Crop Monitoring, Risk Assessment, and Harvest Optimisation | Modern precision agriculture technologies that utilises internet of things support sustainability management of farms by giving updated information about the content of the substances used for the crop, resulting to assisted fertiliser that mitigate unnecessary pollution. Digital Twins have emerged as transformative tools in various industries, yet their potential in enhancing sustainability and efficiency in agriculture remains largely unexplored. This paper aims to bridge this gap by introducing a comprehensive Digital Twin-based system for Smart farming, empowering farmers with real-time monitoring, predictive capabilities, and data-driven recommendations to optimize their agricultural practices. Our study commences with the development of a digital twin specifically tailored for Bok Choy cultivation. This digital replica captures intricate growth dynamics, drawing from real-time data collected through Electrical Conductivity (EC) and ph monitoring. The digital twin acts as the foundation for our predictive analytics, enabling us to anticipate growth patterns and respond proactively to changing environmental conditions. We delve into the integration of machine learning algorithms, which leverage historical growth data and real-time sensor information to forecast Bok Choy growth trends accurately. These predictions serve as a valuable resource for farmers, guiding decisions related to nutrient adjustments, irrigation, and other cultivation practices. Furthermore, we showcase the role of our Decision Support System (DSS) in translating predictive insights into actionable recommendations. By seamlessly incorporating the digital twin and machine learning outputs, the DSS empowers growers with real-time information, enhancing their ability to optimize Bok Choy yield and resource utilization. |
| 9 | Modi Salisu | Extracting Adverse Drug Events from Clinical Notes: A Systematic Review of Approaches Used | Background: An adverse drug event (ADE) is any unfavorable effect that occurs due to drug use. Extracting ades from unstructured clinical notes is essential to biomedical text extraction research because it helps with pharmacovigilance and patient medication studies. Objective: From the considerable amount of clinical narrative text, natural language processing (NLP) researchers have developed methods for extracting ades and their related attributes. This work presents a systematic review of current methods. Methodology: Two biomedical databases have been searched from June 2022 until June 2023 for relevant publications regarding this review, namely the databases pubmed and Medline. Similarly, we searched the multi-disciplinary databases IEEE Xplore, Scopus, sciencedirect, and the ACL Anthology. We adopted the Preferred Reporting Items for Systematic Reviews and Meta-Analysis (PRISMA) 2020 statement guidelines and recommendations for reporting systematic reviews in conducting this review. Initially, we obtained 5,717 articles from the search results from the various databases between 2015 and 2022. Based on predefined inclusion and exclusion criteria for article selection, 100 publications have undergone full-text review, of which we consider 77 for our analysis. Results: We determined the general pattern for extracting ades from clinical notes, with named entity recognition (NER) and relation extraction (RE) as the dual tasks. Researchers that tackled both NER and RE simultaneously have approached ADE extraction as a “pipeline extraction” problem (n=21), as a “joint task extraction” problem (n=7), and as a “multi-task learning” problem (n=5). In contrast, others have tackled only NER (n=27) or RE (n=20). We further grouped the reviews based on the approaches for data extraction, namely rule-based (n=8), machine learning (n=11), deep learning (n=35), comparison of two or more approaches (n=11) and hybrid (n=12). The most used datasets are MADE 1.0, TAC 2017 and n2c2 2018. Conclusion: Extracting ades is crucial, especially for pharmacovigilance studies and patient medications. This survey showcases advances in ADE extraction research, approaches, datasets, and state-of-the-art performance in them. Challenges and future research directions are highlighted. We hope this review will guide researchers in gaining background knowledge and developing more innovative ways to address the challenges. |
| 10 | Somiya Aldweb Almoktar Abukader | Enhancing Rare Disease Diagnosis: A Weighted Cosine Similarity Approach For Improved K-Nearest Neigboourhood | Diagnosing rare diseases is challenging because they affect only a restricted group of individuals, usually identified as one out of every 2,000 people within the European Union and no more than one out of 1,250 individuals in the United States. This makes it difficult for doctors to recognize the symptoms of these diseases. This paper focuses on the challenges of diagnosing rare diseases due to their low prevalence rates and difficulties in recognizing their symptoms. Machine learning techniques often face difficulties in classifying patients with rare diseases because of their small sample sizes, leading to biased results. They proposed a weighted cosine similarity approach as a distance measure for the k-nearest neighbours algorithm instead of the conventional cosine similarity to address this issue. The use of genetic optimization to select the best weights for the weighted cosine similarity. The Rare Metabolic Diseases Database was used as a case study, and the results demonstrated that reducing the classification bias between majority and minority classes improves all classification performance measures. However, as the number of classes and imbalance ratio increase, the approach's effectiveness decreases, eventually reaching zero. Future work will focus on reformulating the g-mean to smooth its values and avoid assigning a zero score when all class instances are misclassified. Keywords: K-Nearest Neighbor, Cosine Similarity, Imbalance Data, Genetic Algorithm, Imbalance Ratio. |
| 11 | Safura Adeela binti Sukiman | Enhancing Personalized Text Simplification through Multi-classification of Dyslexic Students Using Quality of Handwriting Images: A Multi-level Hybrid Convolutional Neural Network and Vision Transformer Method | The term “personalized” refers to generating simplified texts to meet the needs of intended users. As opposed to generic text simplification, the user information i.e., user’s cognitive level must be incorporated. The current personalized text simplification models for dyslexic students capture their diversity using adaptive or controllable approach, where both approaches represent a manual approach which takes longer training time and limits the capability to recommend simplified texts. Alternatively, an automated multi-classification using quality of handwriting images of dyslexic students show a more prominent approach to capture their diversity and further classify them into their corresponding severity level i.e., normal, mild, moderate, and severe. This is due to dyslexic students often exhibit distinct characteristics in their handwriting. The current automated multi-classification using handwriting images is still scarce and limited to using the machine learning methods, where the feature engineering is often a hand-crafted and time-consuming process. Additionally, machine learning has a limited capacity to capture complex patterns, leading towards a struggle with high-dimensional data or intricate relationships. This work proposes a multi-level hybrid Convolutional Neural Network (CNN) and Vision Transformer (vit), a transformation from machine learning to deep learning. The proposed method combines the advantage of local inductive bias from the CNN with global multi-head self-attention in vit for an improved features extraction and recognition of diversity in dyslexic students’ handwriting patterns. The strategy used in this work is multi-level where both the local and global features are extracted parallelly which does not introduce any extra computation cost while at the same time, enlarging the area for computing self-attention within each vit block. The automated multi-classification proposed in this work can serve as an efficient personalization in the text simplification for dyslexic students as their severity level determines how simple the texts must be simplified to enhance their reading comprehension. |
| 12 | Nur farrahin binti maidin | A Comparative Study of Software Product Line Testing Optimization Techniques Using Combinatorial Interaction Testing | A software product line (SPL) is a combination of software products that has similarity in features and functions. These combinations usually resulting in many feature combinations that challenge the testing process. The explosion of the combination of features can lead to exhaustive testing. This exhaustive testing will affect the time and cost for the product to be delivered to market. This paper aims to identify the best algorithm and interaction strength to avoid exhausting testing and reduce the time and cost of the testing process. An experiment has been conducted on most commonly used optimization algorithms in the previous study. The optimization algorithms are the Genetic Algorithm, Cuckoo Search Algorithm, Ant Colony Algorithm and Particle Swarm Optimization Algorithm. Each algorithm was tested with different combinatorial interaction strength from two to six. Results show the best optimization algorithm and the optimum interaction strength that achieve optimum number of features combination that sufficient for the testing process thus can avoid the exhaustive testing in SPL testing. By using the best optimization algorithm with the optimum number of interaction strength, the complexity of the SPL testing process could be reduce without prejudice the quality of the software system itself. |
| 13 | Mashahi Khalafalla Dafaalla Abdelrahman | Adapting Gamification through Reinforcement Learning for Vetting Software Traceability links | Requirement traceability is an important process during the software development, it helps to insure the completeness and validation of the project. Creating traceability links after-the-fact, known as traceability link recovery, creating these links manually is a hard process and it requires long time to achieve it. To create the traceability links automatically, Information Retrieval (IR) techniques are utilized. However, low performance  is found due to some restrictions and limitations. In the literature, there are many studies proposed techniques and enhancement strategies to leverage traceability process and improve the performance, such as natural language processing, artificial intelligence, hybrid approaches, and some works on term weighting scheme. However, although there are some improvement, still some drawbacks are exist. Furthermore, the need for human analysts to examine and validate the traceability links manually or by using some features in the tools is remaining. The involvement of the analyst is necessary to vet the generated candidate traceability links into true or false links, find missing links, and confirm the final traceability matrix. It is a tedious process, moreover, the traceability tools is considered not engaging. The aim of this research is to improve the accuracy of the traceability links by providing a gamified vetting process that use gamification elements and machine learning to motivates the human analyst, increases the engagement, in order to solve the performance issue. Therefore, the research objectives are: 1)To proposed a gamified vetting process to improve the accuracy of trace links. 2) To identify the impact of gamification on promoting the analyst’s motivation and engagements to software traceability. 3)To validate the proposed gamified vetting process through empirical experiment to demonstrate its ability to improve the accuracy of the traceability links. The result is expected to increase the analyst’s motivation and engagement in vetting process, furthermore, improve the accuracy of traceability links in term of precision. |
| 14 | Sivakumar Kalimuthu | To Improve Data Conflict Resolution In A MRAR System By Using A Manual Clustered Activity Labels Approach | Human Activity Recognition (HAR) is a system that is built to monitor human activities, especially those of the elderly living alone in the house. In the last decade, numerous researchers have proposed a HAR system that focuses predominantly on recognizing the activity of a single resident. The activity of a single resident is simple to observe and easy to detect. Numerous state-of-the-art machine learning and deep learning methods have demonstrated promising results for single-resident activity in an ambient assisted living (AAL) environment. However, the smart home environment may have more opportunities for multi-residents, such as companions, neighbors, pets, etc. Multi-Resident Activity Recognition (MRAR) in an ambient sensor environment is somewhat complex and requires certain activity detection and recognition enhancements. Researchers have created MRAR benchmark datasets for further research and implementation, such as ARAS, CASAS, vankasteren, etc., for baseline comparison and performance analysis. Nonetheless, these datasets have limitations in terms of data collection, annotation deficiency, data association, computational cost, etc. Hence, to tackle with the data conflict issues in multi-resident datasets a manual clustered activity label (MCAL) technique is proposed. By clustering the activity labels based on the nature of the activity, the proposed framework overcomes this difficulty in the benchmark dataset. This proposed framework performs a comprehensive analysis of these limitations and manually aggregates the activity labels to record the improvement in the system's performance on the ARAS dataset in terms of recognition rate and computational time. Experiments have been conducted using the ARAS, an ambient sensor-based multi-resident activity recognition dataset. Hence, to tackle with the data conflict issues in multi-resident datasets a manual clustered activity label (MCAL) technique is proposed. By clustering the activity labels based on the nature of the activity, the proposed framework overcomes this difficulty in the benchmark dataset. This proposed framework performs a comprehensive analysis of these limitations and manually aggregates the activity labels to record the improvement in the system's performance on the ARAS dataset in terms of recognition rate and computational time. Experiments have been conducted using the ARAS, an ambient sensor-based multi-resident activity recognition dataset. |
| 15 | Lehka Subramanium | On Identifying the Need for Reliability Risk Assessment Model | Reliability as a non-functional requirement is included in the emergent properties of the software as they are established at the system level. Reliability addresses the loss of functions. Ignorance and lack of understanding of reliability factors during the software development process have evolved into malfunctions in the operational environment. There are significant growing appeals for predicting reliability to account for risks. Prediction of reliability risk has been accounted for to increase customer confidence in minimizing negative effects. The risk assessment techniques are helpful in locating complicated modules, inspecting potentially troublesome modules, and estimating the testing efforts. Nonetheless, a clear definition of reliability risk to identify, classify, and prioritize possible reliability risks is currently lacking. The aim is to demonstrate the feasibility of a reliability risk assessment model at various development phases to minimize the consequences of failure from undesirable emergent properties. |
| 16 | Ahmed Omar | Characterizing the Architectural Erosion Metrics: A Systematic Mapping Study | Software architecture is crucial in determining success or failure in a variety of software development and design fields. Typically, as a system evolves, software architecture deteriorates. This phenomenon is known as architectural erosion. Several studies have addressed architectural erosion based on different solutions. As a result, the metrics technique is the most prevalent solution for architectural erosion. Nevertheless, a comprehensive description of architectural erosion metrics remains unorganized and scattered. This work aims to conduct a systematic mapping to describe and analyze the architectural erosion metrics to provide an overview of erosion metrics and their current trends. Furthermore, no systematic attempts have been made on architectural erosion metrics. The final samples of this study were specified as a total of 43 included papers. Nearly 100 architectural erosion metrics were found. We proposed nine classifications to address architectural erosion challenges, based on adopted approaches in primary studies. The metrics of architectural erosion provide strong evidence for identifying decay and a rapid enabler factor for the adoption of numerous metrics mechanisms to address architectural erosion. The classification of metrics, which is the first of its kind, benefits researchers and practitioners. However, it can be concluded that various aspects are still ambiguous and require further research on architectural erosion measures. |
| 17 | Danga Imbaji Injuwe | Resource allocation for cloud service delivery model | Cloud service delivery model have different resources allocated to each version of service, including: network, compute, server, data, virtualization, erc |
| 18 | Jafar Aminu | An Appraisal on Energy Consumption in Edge Computing: Challenges and Research Direction A Systematic Review | Recently, edge computing has evolved aiming at providing edge services at close proximity. Although the computing capacity at the edge datacenter seems limited, however, the cloud computing environment on the other hand is used to complement edge computing environment through the provisioning of huge computing resources to process applications that requires huge resources. Therefore, minimizing energy consumption at the edge datacenter can be challenging, especially when considering huge demand of resources in processing heterogeneous edge applications. Besides, existing researchers as seen in the literatures have tried to proffer solutions to minimizing energy consumption at the edge datacenter, however, it will be prudent to assume these solutions are different from the already existing ones. Hence, in this research, a review of existing literatures on energy consumption in edge computing environment is carried out. Literatures from Web of Science, Elsevier, and IEEE and Google scholar were drawn. A tabulated literature review on the existing energy consumption approaches was provided together with their strength and weaknesses as well as the simulation environments. Findings show majority of the existing techniques dwell on the use of metaheuristic approaches and thus, are limited in terms of poor convergence speed, imbalance between its local and global search as well as computational complexity. Further findings in the existing literature were outlined and research on future directions were also pointed out. |
| 19 | Tegenu Helen Abeje | Deep Learning Techniques In Recognition Systems For Developmental Disabilities | Developmental disabilities are a diverse group of chronic conditions that impact individuals’ physical, learning, language, or behaviour development. Accurate identification and recognition of these disabilities is crucial for implementing timely interventions .Deep learning plays vital role in identifying between varied disabilities through analysis of complex and heterogeneous dataset. However, the development of precise ,efficient, and robust versions of such systems remains challenging. Therefore, we intend to study the potential of deep learning in the development of advanced recognition systems for developmental disabilities. Thus, through a comprehensive literature review we explored to the advancements in deep learning techniques in recognizing these conditions based on several interdisciplinary studies conducted between 2019 and 2023. The findings show that advanced deep learning approaches such as attention based models, adaptive and robust learning along with multi modal data processing happened to be promising. However both performance accuracy and efficiency of systems to developmental disabilities need to ensured. And the potential trade-offs need to be investigated. There is also an absence of experiments regarding developmental disorders other than Autism Spectrum Disorder(ASD) data. Alongside, online data sources and repositories in the area are indicated. In general, the study emphasizes significance of adopting deep learning techniques in the development of intelligent recognition systems for developmental disabilities. As we move forward inter-disciplinary research collaboration is essential to validate these systems for real-world applications. Key words: Assistive Technologies, Deep Learning, Developmental Disabilities, Recognition Systems |