8<sup>th</sup> International Conference on Green Computing and Engineering Technologies (ICGCET<sup>®</sup>) 22 - 23 September 2022, Shandrani Beachcomber, Mahebourg, Mauritius

https://icgcet.org/

# Proceedings

# of

## 8th International Conference on Green Computing and Engineering Technologies (ICGCET®)

### 22 - 23 September 2022 Shandrani Beachcomber, Mahebourg, Mauritius

Proceeding Editors:

Bishwajeet Pandey, Arthur James Swart

### Chair Message

As a chair, we have the honor to welcome you with great respect and enthusiasm to the 8th International Conference on Green Computing and Engineering Technologies (ICGCET®) to be held in Hybrid Mode on 22-23 September 2022 (ONLINE for participant who unable to come to Mauritius). ICGCET'2022 intended to attract innovative technical and scientific work in the field of science, technology and engineering. The response to the conference was overwhelming and we are proud to state that we have received really good quality contributions and we are sure as a participant you will share the same sentiment. All accepted papers will be submitted to either SCOPUS or WOS-ESCI Index Journal (see list on conference website) and hopefully these papers will be available online by end of 2022.

As a chair and on behalf of the organizing committee, we are extremely happy to host you at Mauritius and we are working to provide you a memorable hospitality as you are coming from different parts of the world to share and contribute in the areas of their expertise. We hope to provide a good platform to the participants, where not only they meet and share their vision, ideas but also fertilize their thoughts in the ever-growing area of computer science and electronics engineering technologies. We are also confident that our keynote speakers will be able to enrich your knowledge during the conference.

It is the 23<sup>rd</sup> conference hosted by Gyancity Research Consultancy in association with partner university across the globes, next two conference in 2022-2023 are following:

8th International Conference on Recent Trends in Computer Science and Electronics (RTCSE <sup>®</sup>) January 5-7, 2023, University of Hawaii, Manoa 2520 Correa Road, Hawaii, USA <u>https://rtcse.org/</u>

6th International Multi-Topic Conference on Engineering and Science (IMCES) 29-30 June 2023 Yarsi University, Jakarta, Indonesia https://imces.tech

Best wishes. **Prof Dr Arthur James Swart** Central University of Technology, South Africa **Prof Dr Bishwajeet Pandey,** Jain University, India

Tel/Whatsapp: (+27)-82-856-5780, +91-74-28-640-820,

Email: imces@gyancity.com, dr.pandey@ieee.org, aswart@cut.ac.za

### ICGCET-2022 Schedule

### 23 September 2022 (ONLINE PRESENTATION)

### Video Presentation:

Available 24x7 on YouTube Channel of Gyancity Research Lab: https://www.youtube.com/channel/UCHtdIuXB1evhmQb3zQ82uCA

### 9:00-11:00 (Mauritius Time)

Satellite Session Google Meet Link: meet.google.com/zik-xman-amn Paper Id: 0577, 1073, 1969, 2313, 2393, 3222, 5910, 6869, 7134, 7515, 7659, 8112, 8544, 8687, 9252, 9944 Chaired by **Prof Dr. Bishwajeet Pandey, Jain University, India** 

### 22 September 2022 (OFFLINE PRESENTATION)

**10:00-11:00 AM (Mauritius Time)** 

• Inaugural Speech: General Chair Prof Dr. Arthur James Swart, Central University of Technology, South Africa

11:00-12:30 (Mauritius Time)

• Session 1: Chair: Prof Dr. Ben Kotze, Central University of Technology, South Africa

Paper Id: 2604, 2702, 5270, 6593,

12:30-13:00 (Mauritius Time) Keynote Speech by Prof Dr. Bishwajeet Pandey, Jain University, India 13:00-14:30 (Mauritius Time) LUNCH

14:00-16:00 PM (Mauritius Time)

• Session 2: Chair: Prof Dr. Noman Shabir, Tallinn University of Technology, Tallinn, Estonia.

Paper Id: 2169, 2498, 3783, 4644, 4900

# ICGCET'2015: 1st International Conference of Gyancity at Dubai, UAE



## RTCSE'16: 2<sup>nd</sup> International Conference of Gyancity at Kuala Lumpur, Malaysia





### ICGCET'2016: 3<sup>rd</sup> International Conference of Gyancity at Aalborg University, Esbjerg, Denmark

### Institut i Esbjerg samler forskere fra hele verden

DEL f 🎔 Af Er nd Jacobsen 15. august 2016 kl. 05:31 40 forskere og studerende fra hele verden samles på Institut for Energiteknik, Aalborg Universitet Esbjerg, i tre dage i denne uge, når der afvikles en international konference, der handler om at gøre D.M. Akbar Hussain, lektor ved Institut for computerteknologi mere Energiteknik på Aalborg Universitet Esbjerg, grøn. har sammen med en kollega fra Indien arrangeret konferencen International Conference on Green Computing and Engineering Technologies.

Det er planen, at disse konferencer skal afvikles i Esbjerg hvert andet år – ganske enkelt fordi Institut for Energiteknik i Esbjerg er internationalt anerkendt.



## RTCSE'17: 4<sup>th</sup> International Conference of Gyancity at Kuala Lumpur, Malaysia





### IMCES'17: 5<sup>th</sup> International Conference of Gyancity at Kuala Lumpur, Malaysia





## ICGCET'2018: 6<sup>th</sup> International Conference of Gyancity at Limerick, Ireland





### RTCSE'2018: 7<sup>th</sup> International Conference of Gyancity at Bangkok, Thailand





### ICGCET'18: 8th International Conference of Gyancity at Aalborg University, Esbjerg, Denmark





### RTCSE'2019: 9<sup>th</sup> International Conference of Gyancity at Univeristy of Hawaii, USA



## IMCES'2019:10<sup>th</sup> International Conference of Gyancity at Port Louis, Mauritius





### ICGCET'2019: 11th International Conference of Gyancity at Casablanca, Morocco





## RTCSE'2020: 12<sup>th</sup> International Conference of Gyancity at University of Hawaii, USA





### IMCES'2020: 13th International Conference by Gyancity at Jakarta, Indonesia

### ICGCET'2020: 14<sup>th</sup> Conference by Gyancity at St Petersburg, Russia



Conference on Green Computing and Engineering Technologies (ICGCET®).

The international conference is scheduled from 16th-18th September 2020 at Herzen State Pedagogical University, St Petersburg, Russia. The traditional face-to-face meeting was replaced by the online meeting due to a pandemic situation. The first online session was conducted through CISCO WebEx app.

Dr. Pandit along with co-chair Dr. Bishwajeet Pandey, Birla Institute of Applied Sciences, Bhimtal Uttarakhand, and associated with Gyancity Research consultancy conducted the first session and an introductory talk.

The attendees across the world presented their work through an online meeting and recorded video presentations. The presentation and other videos are uploaded for public viewing on YouTube channel for wider academic sharing,

The convener of the conference Prof. Jason Levy, University of Hawaii, USA, Prof. Geetam S Tomar, Director Birla Institute of Applied Sciences, Bhimtal, India, congratulated on the successful organizing of the sessio

Dr. Amit Kant Pandit thanked coordinators for arranging such academic meetings in difficult times

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9:36 AM @ jammubulletin.com 35%

### SMVDU Faculty chairs Online Session at 6th International Conference on ICGCET

JAMMU BULLETIN NEWS KATRA, SEP 18:

Dr Amit Kant Pandit, Faculty, SoECE, SMVDU chaired an online session in 6th International Conference on Green Computing and Engineering Technologies (ICGCET®) today. The international conference is scheduled from 16th-18th September 2020 at Herzen State Pedagogical University, St Petersburg, Russia. The traditional face-to-face meeting was replaced by the online meeting due to a pandemic situation. The first online session was conducted through CISCO WebEx app.Dr. Pandit along with co-chair Dr. Bishwajeet Pandey, Birla Institute of Applied Sciences, Bhimtal Uttarakhand, and associated with Gyancity Research consultancy conducted the first session and an introductory talk. The attendees across the world presented their work through an online meeting and recorded video presentations. The presentation and other videos are uploaded for public viewing on YouTube channel for wider academic sharing. The convener of the conference Prof. Jason Levy, University of Hawaii, USA. Prof. Geetam S Tomar, Director Birla Institute of Applied Sciences, Bhimtal, India, congratulated on the successful organizing of the session. Dr. Amit Kant Pandit thanked coordinators for arranging such academic meetings in difficult times.

### RTCSE'2021: 15th International Conference of Gyancity at University of Hawaii, USA



### BMESS'2021: 16th Virtual Conference by Gyancity

### IMCES'2021: 17th International Conference by Gyancity at Yarsi University, Indonesia



### ICGCET'2021: 18th International Conference by Gyancity at National University of Federico Villareal, Lima, Peru

Evento se dará el 22 y 23 de septiembre. Foto: difusión





16 Set 2021 | 12:40 h Actualizado el 16 de Setiembre 2021 | 12:40 h

Este 22 y 23 de septiembre se realizará la 7ª Conferencia Internacional sobre Tecnologías de Ingeniería y Computación Ecológicas 2021 (ICGCET-2021) y la 13ª Conferencia Internacional en Inteligencia Computacional y Redes de Comunicación 2021 (CICN 2021), eventos que tendrán como sede a la Universidad Villareal (UNFV).

Juan Alfaro, rector de la UNFV, será el encargado de inaugurar los referidos certámenes, el miércoles 22 a las 10.00 a.m. Previamente, Akbar Hussain, de la Universidad Aalborg de Dinamarca, será el encargado de brindar las palabras de bienvenida.

La ICGCET-2021 presentará las investigaciones de diferentes áreas de la ciencia y la tecnología, y proporcionará una plataforma para que investigadores y científicos de todo el mundo intercambien y compartan sus experiencias y resultados de investigación.





### ICGCET'2021: 18th International Conference by Gyancity at National University of Federico Villareal, Lima, Peru





### RTCSE'2022: 19th International Conference of Gyancity at University of Hawaii USA





### BMESS'2022: 20th International Conference by Gyancity at Bath Spa University UAE





### ICAIC'2022: 21st International Conference by Gyancity at University of Houston-Victoria, USA



22

# IMCES'2022: 22<sup>nd</sup> International Conference by Gyancity at Aalborg University, Esbjerg, Denmark



577	
	The Impact of Human Resources Management
	in Strategic Plan Preparation
	Rateb Almajali <sup>1</sup> , Asmahan Aljaafreh <sup>2</sup> , Sayel Al-nethami <sup>3</sup> , Nabeel Asasfeh <sup>4</sup> , Abdalrahman Alabadleh <sup>5</sup>
	Mutah University, Jordon
	rateb@mutah.edu.jo, asm2927@mutah.edu.jo, sayel@mutah.edu.jo, Nabeelasasfeh@yahoo.com, abadleh@mutah.edu.jo
	ABSTRACT
	The quantity and quality of Human Resources HR available in the organization is very important. Thus, the HR through which the various business activities are done. Hence it is considered vital to the organization's strategy. Moreover, HR planning is a link between the organization's strategy and management of these resources, so that in the light of the data and the requirements of the strategic plan of the organization and trying to achieve its goals in the future, the HR planning shall forecast and then estimate and identify the needs of the Strategic Plan of HR, on which Human Resources Management HRM initiate establishing its work strategy so as to serve and contribute to the implementation of the organization's strategy. In the light of the needs of the organization of HR in terms of their numbers and quality, HRM shall draw their policies and programs of activities and practices in the areas of recruitment, selection, appointment and training and development etc., and determine the scope of the exercise of these policies and programs within the organization. Hence, the results of HR planning are shaping the general framework of the strategy for the management of these resources, which will work within it, to be integrated and consistent with the implementation requirements of the Organization's strategy of human skills and competencies efficient and eligible for work with a high level of productivity and efficiency. <b>Keywords:</b> Human Resources, Strategic Plans, Modern Management.

1073 An intelligent quality management system for flexible manufacturing systems: Case of circuit breakers assembly system with interchangeable tools/stations Thabo George Bihi and Kanzumba Kusakana Department of Electrical, Electronic and Computer Engineering Central University of Technology, Free State Bloemfontein, South Africa tgbihi@cut.ac.za, kkusakana@cut.ac.za, ABSTRACT The aim of this study is to design, construct and evaluate an Intelligent Quality Management System (iQMS), which may learn and adapt to the change of the Flexible Manufacturing System (FMS). The literature on flexible manufacturing is used to provide context and highlight the problem statement. A case study is used to showcase the challenges encountered, when circuit breakers of varying specifications are set up in an assembly system with interchangeable tools/stations. The development of the Quality Management System, is discussed, detailing the hardware and software aspects of the research study. The concluding discussion focusses on the results from the iOMSs testing and data collection process, as well as suggested future work. The main contributions of the study, in comparison with further available research, regarding the manufacturing industry and industry 4.0, are also highlighted. The study realized a data management system that caters to the unique data management requirements of Flexible Manufacturing Systems. A major highlight of the study shows the benefit of reworking quality management practices using new digital advances. Keywords: Flexible Manufacturing, Cyber-Physical, Quality Management



2169	
	Analyzing the impact of pigeon droppings on the output performance of a Pico solar system
	Arthur J Swart <sup>1</sup> Pierre E Hertzog <sup>2</sup>
	<sup>1,2</sup> Department of Electrical, Electronics and Computer Engineering Central University of Technology, Private BagX20539, Bloemfontein, 9300
	<sup>1</sup> aswart@cut.ac.za <sup>2</sup> phertzog@cut.ac.za
	ABSTRACT
	Renewable energy systems have become commonplace around the be, especially as many countries encounter load shedding, where power is switched off periodically to specific neighborhoods within a city. Keeping the lights on at night during load shedding can help to reduce crime and improve security for a household. This can be achieved by using a small renewable energy system, such as a Pico-solar system (less than 20 W). However, the efficiency of such a system needs to be maintained through ongoing preventative maintenance. The purpose of this paper is to analyze and verify the impact of pigeon droppings on a Pico-solar system so as to recommend preventative maintenance to mitigate accelerated degradation. Quantitative data is collected from an experimental setup where a LabVIEW model was built to log data from several identical 10 W PV modules. A data logging circuit was designed as an interface that was connected to an Arduino Mega microcontroller board that sensed current and voltage values from the PV modules with an infrared camera (FLIR E60). Data used in this study was collected in the first half of 2022. Results show that the surface temperature of a PV module increased significantly (~17% higher than a non-shaded module) due to the original forward current being forced through a higher resistance path within an individual cell that is partially shaded by a single pigeon dropping. It is recommended that PV modules be cleaned regularly to reduce output power losses and premature degrading due to pigeon droppings.

2313	Implementation of Novel Power Efficient AES Design on High Performance FPGA
	Yashwant Aditya, Keshav Kumar
	ABSTRACT
	In the age of Information and Communication Technology (ICT), the globe is much concerned about two major challenges that are secured data transmission and power efficiency. This work highlights both challenges. In this work, we have designed a power-efficient design of the Advanced Encryption Standard (AES) algorithm using the Field Programmable Gate Array (FPGA) device. The implementation of the AES is done on VIVADO Design Suite, and the results are observed on Spartan-7 FPGA. To optimize the power consumption of the AES on the FPGA device, Stub Series Terminated Logic (SSTL) Input Output (IO) is used. IO standards are used in FPGA to match the impedance so that the power consumption is optimized. On analysing the power consumption, it is observed that as the input voltage of the IO standard is increased the Total Power Consumption (TPC) also gets increased. The TPC observed is minimum for SSTL 135 IO and it is maximum for SSTL_18_II IO. <b>Keywords:</b> Advanced Encryption Standard (AES), Field Programmable Gate Array (EPGA). Information and Communication Technology (ICT). Stub
	Array (FPGA), Information and Communication Technology (ICT), Stub Series Terminated Logic (SSTL), and Total Power Consumption (TPC).

2393	
	<b>Optimal Sensor Placement Strategy for Event</b>
	Monitoring in Smart Homes
	Khaled Mohammed <sup>1, 2</sup> <sup>(1)</sup> Programming Technology Department, Sana'a Community College, Yemen <sup>(2)</sup> Administration Information System Department, Faculty of Economic & Administration Science, Queen Arwa University, Yemen, <u>Khaled.Mohammed@scc.edu.ye</u>
	ABSTRACT
	Optimal sensor placement in smart homes aims at complete coverage, cost reduction and minimization of energy consumption. This paper presents a heuristic strategy for sensor placement through cooperation of multiple sensors. Wireless cams, passive infrared sensors (PIRs) and RFIDs cooperate through a master gateway. Algorithms are presented for the cooperative control of the smart home environment, Frist time uses Minimum Ratio (MR) algorithm in smart home. System performance is evaluated through an intensive use in a real home setting. Results indicated complete coverage of home areas, optimal number of sensors and high savings in both energy consumption and video-storage requirements.
	<b>Keywords:</b> SMEs, integrated system, risk management, information security, business continuity Internet of things, smart homes, optimal sensor placement, Minimum Ratio, and cooperative control

2498	
	Short-term PV Energy Generation Forecasting
	using Deep Learning
	Noman Shabbir <sup>*,1,2</sup> , Roya Ahmadiahangar <sup>1,2</sup> , Argo Rosin <sup>1,2</sup> , Victor Astapov <sup>2</sup> , Jako Kilter <sup>2</sup> <sup>1</sup> FinEst Centre for Smart Cities (Finest Centre), <sup>2</sup> Dept. of Electrical Power Engineering & Mechatronics Tallinn University of Technology, Tallinn, Estonia. {noshab,roya.ahamdia,argo.rosin,victor.astapov, jako.kilter}@taltech.ee
	ABSTRACT
	Solar photovoltaic (PV) energy generation has witnessed exponential growth in the last few years due to increasing energy costs from fossil fuels and environmental factors. However, this PV generation energy has intermittent characteristics due to seasonal variations and time. The future electrical grids require stability and flexibility for smooth operation. Therefore, accurate PV energy generation forecasting can be beneficial in this regard. In this paper, deep learning (DL) based recurrent neural network (RNN) has been proposed for short-term PV energy generation forecasting. The PV energy generation data was measured in rural Estonia for a 600-kW power plant for the whole year with a one-hour time step. The weather data and the historical PV generation data have been used in the development of this forecasting algorithm. The long short-term memory network (RNN-LSTM) has been used for a 24-hours ahead of forecasting. The comparative analysis of these forecasting gives a value of root mean square error (RMSE) of around 9 kW.
	<b>Keywords</b> : Renewable Energy, Solar PV, Energy Forecasting, Deep Learning, Recurrent Neural Networks

2604	
	Potential of PCM Materials in Building Walls in
	La Reunion Island: A Numerical Study
	<u>Dimitri BIGOT<sup>1</sup></u> , Bruno MALET-DAMOUR <sup>1</sup> , Lionel Trovalet <sup>1</sup> , Lisa Liu <sup>1,2</sup> Nadia Hammami <sup>2</sup> and Jean-Pierre HABAS <sup>2</sup>
	<sup>1</sup> University of La Reunion Island, PIMENT Laboratory, La Reunion (France) <sup>2</sup> Institut Charles Gerhardt, University of Montpellier, CNRS, ENSCM, Montpellier (France) <u>dimitri.bigot@univ-reunion.fr</u>
	ABSTRACT
	The French government has set up thermal regulation policie to minimize building energy consumption and ensure occupant's comfort in residential buildings. In French Overseas Countries, such as Reunion Island, this regulation is named RTAADOM for "Acoustic, Aeraulic and Thermal Regulation applied to French overseas country." It is used to design building walls, particularly the insulation materials they are made of, according to the building environment, which is described by four major climatic zones in the island. The present work highlights the potential of using phase change materials (PCM) as a candidate to improve insulation solutions traditionally used to comply with the regulation. The paper focuses on building's indoor temperatures and the related thermal comfort conditions to show that using a PCM can be an excellent solution to improve building thermal behavior in compliance with regulation needs.
	<b>Keywords:</b> PCM, thermal modeling, thermal regulation, comfort.

2702	
	Re-use waste for building thermal insulation :
	case study of loose-fill plastic waste in cold and
	humid climate
	Bruno MALET-DAMOUR <sup>1</sup> , Laurane RUGGERI <sup>1</sup> , Dimitri BIGOT <sup>1</sup> and
	Jean-Pierre HABAS <sup>2</sup> <sup>1</sup> University of Reunion Island, PIMENT Laboratory, Reunion (France)
	<sup>2</sup> Institut Charles Gerhardt, University of Montpellier, CNRS, ENSCM, Montpellier (France)
	bruno.malet-damour@univ-reunion.fr
	ABSTRACT Plastic waste is a major environmental and scientific challenge of our century. The current paradigm of "waste management" must evolve towards "resource management" by identifying a highly sustainable material consuming sector. The general objective of this paper is to propose a simple, economical and efficient solution for the recovery of plastic waste for the building sector. We have experimentally evaluated the performance of a Loose-Fill Plastic Waste (LFPW) as a thermal insulation solution. For this purpose, a literature review was conducted to guide the design and conduct of an experimental study on test cells in the cold and humid climate of Reunion Island (France). Our literature review shows that this form of plastic waste recovery is a world first. The LFPW reduces surface temperatures by nearly 5.4 °C, with a maximum difference of nearly 16.5 °C. The thermal phase shift is also remarkable (between 70 and 150 minutes). This technical solution makes it possible to achieve performances comparable to conventional thermal insulation solutions while combining circularity and technological development. It is a realistic opportunity for emerging countries.
	<b>Keywords:</b> recycling   plastic waste   construction   thermal insulation   loose-fill

3222	
	A Multimodal Wireless System for Instant
	Quizzing and Feedback
	Khaled Mohammed <sup>1, 2</sup>
	<sup>(1)</sup> Programming Technology Department, Sana'a Community College, Yemen
	<sup>(2)</sup> Administration Information System Department, Faculty of Economic & Administration Science, Queen Arwa University, Yemen, <u>Khaled.Mohammed@scc.edu.ye</u>
	ABSTRACT
	This paper presents a wireless system for instant quizzing in the classroom and collecting students' feedback on teachers performance. This system is integrated with a student attendance management system to facilitate management of quizzing and quiz marking in addition to questionnaires about Quizzes. Such a system is very essential for following attendance and student learning progress in addition to formative assessment. The system uses two communication technologies: Wifi, and Radio Frequency Identification (RFID). Such a low-cost system assures attendance follow up to assure abiding by the university bylaws, avoid spoofing and cheating, and enhance both teaching and learning. A student recommendation system is also implemented to increase student retention and enhance students success rate.
	<b>Keywords:</b> Educational Platform, Student Attendance Management, Quiz Management System, Radio Frequency Identification (RFID), Face Verification, Students Alert System.

3783	
	Development of IoT-based Machine Learning
	Application for Data Anomaly Detection Within
	a Smart Manufacturing Plant
	T.G Kukuni <sup>1</sup> , E. Markus <sup>1*</sup> , B. Kotze <sup>1#</sup> , A.M. Abu-Mahfouz <sup>2</sup> <sup>1</sup> Department of Electrical, Electronic and Computer Engineering Central University of Technology, Free State Bloemfontein, South Africa <sup>1</sup> tgkukuni@gmail.com, <sup>1*</sup> emarkus@cut.ac.za, <sup>1#</sup> bkotze@cut.ac.za, <sup>2</sup> Council for Scientific and Industrial Research, Gauteng Pretoria, South Africa <sup>2</sup> aabumahfouz@csir.co.za
	ABSTRACT
	The application of machine learning in resolving complex cyber-security challenges in smart manufacturing plant is growing. Network intrusion and anomaly detection is posing high risks in sensory data integrity and optimisation of processes leading to high efficiency and high profits within smart manufacturing plants. This research paper makes use of interquartile range algorithm for the detection of anomalies. The data is collected within a 5-hour period and is transmitted to Google sheets via WiFi connectivity. However, the data transfer requires the user to permit access to the google account for this process to take place. After the addition of errors for every 11 <sup>th</sup> entry, the file is resent back to Raspberry PI for the execution of interquartile range algorithm. Once the results are obtained, the results file is transmitted via WiFi connectivity to the output monitor. This research results demonstrates that if the data collected is higher or lower than the required threshold (11-14°C for temperature and 45-50% for humidity) the system will automatically detect and flag the anomaly. This paper therefore concludes that the use of interquartile range algorithm for anomaly detection based on sensory data is relevant and efficient for such an investigation.
	<b>Keywords:</b> Anomaly, Intrusion Detection System, Machine Learning, Cybersecurity, IoT, Sensory Data, Smart Manufacturing Plant.

Application of Machine Learning for Image Artefact Detection based on Computer Tomography Scanner
J.H.B Benganga <sup>1#</sup> , B. Kotze <sup>1*</sup> , T.G. Kukuni1 <sup>**</sup> <sup>1</sup> Department of Electrical, Electronic and Computer Engineering Central University of Technology, Free State Bloemfontein, South Africa <sup>#</sup> hervebenganga@gmail.com, *bkotze@cut.ac.za, **tgkukuni@gmail.com
ABSTRACT
The application of machine learning in solving complex medical and non-medical challenges keeps growing. The use of CT scanners is very crucial in saving lives hence the need to investigate alternative approaches for solving artefacts found in Computer Tomographic images. In some instances, such faults takes a while to figure out the types of artefacts and their causes due to large datasheets. It is, therefore, against this background that such a study needs to be investigated. This paper makes use of 180 image datasets and feature detection is applied on each dataset (ring and metal) and both datasets are trained for both 25 and 50 epoch test. After completion of both epochs, unknown datasets are inputted into the model. This research results thus concluded that the model is efficient with an accuracy of 87% and 91% respectively for both 25 and 50 epochs. As a result, these results demonstrates the stability of the model and shows that the more images with higher resolutions are in a dataset, the higher the

4900	Investigating the Current and Potential
	Distribution of Lightning on a Building to
	Determine Adequate Protective Measures
	Jacques Johan Keyser, James Swart, Pierre Hertzog
	Department of Electrical, Electronic and Computer Engineering, Central University of Technology, Free State jjkeyser34@gmail.com aswart@cut.ac.za phertzog@cut.ac.za
	ABSTRACT
	In South Africa, lightning is responsible for millions of deaths, which is significantly more than the global average. In particular, Bloemfontein (a large city in the Free State Province of South Africa) is classified as having a high susceptibility to direct lightning strikes, making it a focal point for imposing lightning education and protection measures, owing to the city's rapid population growth. The challenge exists when people are not educated in lightning protection measures, which is the last thought when constructing new structures, thus leaving a blank space when it comes to budgeting. A proposed lightning protection system was designed for the Free State Provincial Government building based on the results of a lightning risk analysis. The proposed LPS was evaluated in terms of mitigation to demonstrate the economic impact of lightning to the study, ten down-conductors would suffice and would only increase the required separation distance by 11 cm, as opposed to the recommended number of sixteen down-conductors, to prevent lightning from flashing to any structural metallic elements of the building.
	<b>Keywords:</b> Lightning Protection System (LPS), Advanced Lightning Simulation Software (XGSLab), Lightning Protection Level (LPL), Lightning Electromagnetic Impulses (LEMP), Surge Protection Devices (SPDs)

5270	
	Metric comparison between Google Scholar and
	Research Gate for engineering academics
	Arthur James Swart
	Central University of Technology
	<u>dijuniosswart e gnan.com</u>
	ABSTRACT
	A researcher's reputation is influenced by the quantity and quality of his or her publications. A record of these publications is usually kept by an academic in a resume or on an online platform, such as LinkedIn, Google Scholar or Research Gate. The purpose of this article is to contrast the major metrics of Google Scholar with that of Research Gate of a number of engineering academics employed at a university of technology in South Africa, in order to determine any notable differences. A quantitative study is undertaken to gather the total number of citations, h-index values and Research Gate scores for engineering researchers present on both databases. Results indicate that Research Gate has the highest number of authors present from the Faculty of Engineering, Built Environment and Information Technology at the Central University of Technology. However, Google Scholar records the highest number of citations for these authors. Only 31 out of the possible 86 academic staff members maintains a profile on both databases, where only 4 researchers have more than 500 citations. It is recommended that management mandate the presence of their academic staff on one of many available databases in this regard, thereby enhancing the visibility of the research done at the university and enabling an easier review of the achievements of staff for performance management purposes or for promotion. <b>Keywords:</b> citations, h-index, score, quantitative, data mining, data analytics

A consumer VPN framework to address its
associated security and privacy risks
Yashwant Aditya Department of Computer Science, University of Warwick, UK <u>Yash.adi01@gmail.com</u>
ABSTRACT
There is no debate that Virtual Private Network (VPN) is one of the fastest-growing internet-based technology of the day. It is purely an innovative item which has become indispensable for numerous individuals. VPN technology and its associated tools have been widely adapted by the IT industry to connect to remote website through secure tunnels and is also popular among consumer VPN users for widespread consumption. Consumer VPN is generally used to give security and privacy to the web-based movement of its clients. This research aims to identify areas for possible consumer VPN enhancement and current gaps in order to make it a more dependable solution for most clients. These undertakings will go quite far in winning the trust of those web clients who are not confident with customer VPN for confidentiality and security of their data. In order to understand and address the security flaws in consumer VPN systems and to suggest areas of improvement, an extensive literature review was conducted. This research additionally endeavors to cover the recent security breaches in the consumer VPN system. Going above and beyond, data has been gathered from consumer VPN. This work has been made to figure out the areas of improvement and to potential solution(s) for improvement. Due to the absence of any standard and guidelines in consumer VPN services, it is essential to characterize a norm or standard to address existing challenges in customer

6593	
	Social Stress and an Urban Planning Conflicts that
	Changes the Historical Appearance of
	Megalopolis: Social Media Data
	Aleksei Raskhodchikov Moscow Centre of urban studies "City" <u>silaslowa@mail.ru</u>
	Maria Pilgun
	Russian State Social University
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	ABSTRACT
	Objectives: the aim of this project is to elaboration of an algorithm for analyzing opinion mining and social stress on the material of social media data using the example of an urban planning conflict. Methods: to analyze the content of social media, a multimodal approach was used involving neural network technologies, text analysis, sentiment analysis, analysis of word associations and content analysis. Findings: this algorithm has shown its effectivenessthe. Dynamics of communication processes in the information space around the project is characterized by an escalation of the conflict between residents, builders and city authorities. Data analysis suggests about the presence of social stress and further development of the conflict as the project progresses. Application: the results of the study can be used in urban planning policy to timely identify conflicts between the city authorities and citizens and to prevent the growth of social tension.
	Keywords: Social Stress, Perception, Urban Conflict, Social Media Data, Opinion Mining, Neural Network Technologies



7137	
7134	LEVEL OF UNDERSTANDING AND
	PERCEPTION AMONG STUDENTS OF KUIPs
	ON THE T&L METHODOLOGY OF HADITH
	STUDIES
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	ABSTRACT
	The study of hadith has taken place since the Prophet PBUH by various methods. The issue of teaching and learning hadith is an issue that researchers often study to improve the standard and quality of Teaching and Learning (T&L). This is because there is a statement that hadith lecturers are not creative in teaching, lack pedagogical skills and do not apply the latest innovative methods in the T&L process. Therefore, this study aims to examine students' perceptions and understanding of the study of hadith, their perceptions of the study methodology and observe the problems students face in the study of hadith. The importance of this study is to reveal the form of implementation of the hadith study and the methodology used in learning. This study was conducted at Kolej Universiti Islam Perlis (KUIPs) with the participation of 141 students from the Diploma in Islamic Studies. The quantitative method was used in the form of questionnaires. The data obtained were analyzed descriptively to identify the hadith study system among KUIPs students. The value of Cronbach's Alpha validity and reliability for the entire questionnaire item was high, i.e. 0.802. The study results found that students' level of understanding and knowledge of the study of hadith is 4.09, and the mean level
	of students' perception of the methodology of lecturers in the study of hadith is 4.10.
	Keywords: Student understanding, student perception, hadith study, Perlis.

7515	
	Designing of Modified Scissor Lift with Enhanced
	Mechanical Advantage
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	ABSTRACT
	This research paper is a brief report on the working, types and design elements of a simple scissor lift. This paper highlights the material properties of the components in the lift and its design.
	Keywords: Scissor lift, stress, force, Design, insert

7659	
	AI Based Improved Optimizer for Solving Energy
	Issues
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	ABSTRACT
	In order to distribute energy over a large area, an overhead power line contains multiple conductors attached to poles. Transmission line parameters are critical to power system stability analysis and state estimation. By taking into account four different aspects of the problem - dimension identification, exploration controls, improved prey encircling and candidate solution choosing - authors have presented an AI based improved grey wolf optimization (IGWO) method for determining the parameters of the overhead AC transmission lines. Improved grey wolf optimization algorithms for calculating capacitance and inductance per unit length were developed for 3-phase with different bundle conductors. Global or nearly global optimal control variable sets are better served by the IGWO methodology than other approaches. Furthermore, the proposed research shows that the or AI based IGWO can compete with existing methods and solve real-world optimization challenges. Because the AI based IGWO algorithms have been enhanced, they are more effective than other methods. It has been statistically proved that the strategy under investigation generated the best possible results for several of these functions. It has been found that the suggested method is computationally faster, more accurate, and more reliable in terms of durability and accuracy.

8112	A review of Rubber Tyred Gantry cranes energy efficiency improvements based on energy monitoring, energy storage systems and optimal operation control strategies
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	ABSTRACT
	To cater for the growing world seaborne transport sector, harbours are looking for ways to enhance the efficiency of their handling and transfer infrastructure, in terms of the performance, operation, equipment and technology. Terminals mostly use Rubber Tired Gantry (RTG) to organise container aisles, loading and moving cargo-containers. This work reviewed the available literature published on the efficiency improvement of RTG cranes, including the general operation and main components of a RTG crane, the energy monitoring of RTG cranes during their operations, the different energy storage systems used in retrofitting RTG cranes, as well as the various strategies and algorithms used for the optimal control and energy management of RTG cranes. Gaps in the available literature and scope for future research related to energy efficiency of RTG cranes have been identified.
	<b>Keywords:</b> Energy Efficiency, RTG cranes, Diesel Generator, Storage systems, Control methods

### Abstract of Paper Accepted in ICGCET'2022

8544

Preclinical tests of Vaccine against
Rhinopneumonia and Strangles of young
horses

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#### ABSTRACT

Efficacy and safety of the combined vaccine against rhinopneumonia and strangles of horses were evaluated on outbred mice and rabbits. Acute toxicity, pyrogenicity and immunogenicity were carried out in accordance with the methods regulated by the Rosselkhoznadzor of the Russian Federation. The absence of toxicity was established with a single intragastric administration of the vaccine to white mice. An analysis of the dynamics of the body weight of white mice revealed an increase in both the control and experimental groups. Thus, the increase was 9.2% in the experimental group that received the vaccine preparation, and in the control group - 5.05%. Therefore, in mice treated intragastrically with the vaccine preparation, active growth is observed in comparison with the control. The difference was 4.15%. The disease and mortality among vaccinated mice were not noted, which indicates its harmlessness and safety. The test of the vaccine preparation on rabbits showed its non-pyrogenicity. In the third hour after the administration of the drug, the temperature of rabbits in the control group rose by 0.2°C, and in the experimental group by 0.4°C. However, during a clinical examination of the experimental animals of both groups, signs of illness and changes in the general condition were not recorded. Thus, the studied vaccine preparation was considered non-pyrogenic, since after its administration to rabbits, a slight short-term increase in body temperature is observed in animals of both groups, in which the general condition of the animals remains favorable. The aim of our research was to study the efficacy and safety of the combined vaccine against rhinopneumonia and strangles of horses in laboratory conditions. This paper presents the results of preclinical studies on laboratory animals. The absence of acute toxicity, allergenic, pyrogenic properties and the safety of using the associated vaccine against rhinopneumonia and strangles of horses on laboratory animals have been proven.

**Keywords:** combination vaccine, acute toxicity, pyrogenicity, immunogenicity, horse strangles, rhinopneumonia, immunomodulator

Dynamic RFID Data Filtering and Application
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<b>ABSTRACT</b> Radio-frequency Identification "RFID" Technology uses the radio frequency waves to transfer the RFID data between RFID readers and tags which are used to identify objects/ employees without line of sight. The RFID data which is captured by the tag reader may contain false readings, noise, and duplicates which implies data filtering and cleaning. Therefore, it is necessary to develop efficient processing algorithms of RFID data. This paper presents a dynamic technique to filter the RFID data, eliminate duplicates and filter noise. Data filtering during employee identification in the work place enhances the performance of employee attendance management systems. The proposed system compared to De-noising and duplication Elimination approach under different arrival rates at a rate 0.1tag/sec and under the noise rate at rate between 0.08501 tag/sec
noising RFID data, Dynamic RFID Data Filtering and Employee Attendance Management

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9252	
	E-Business Tools Capabilities for Mobility and
	Integration Enterprise System
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	ABSTRACT Enterprise systems, as opposed to agency or group specific programmes are software applications with pass capabilities. These platforms enable cross organizations corporations and interaction by collecting information and data that is searchable and usable for many organizations. The purpose of this paper is to empirically analyse the capabilities of the enterprise business system of organizational factors that are used into the capabilities of some organizations such as adhocracy culture and top management support, e-business implementation, and organizational performance which is efficiency, sales performance, customer satisfaction, relationship development. Enterprise systems also have a particular role in structural changes in the economy and also must respond to these unforeseeable changes by providing suitable solutions to customer at a reasonable cost and time without experiencing of the entire systems in the first place which can result in more time. As a result, businesses should consider the mobility element while installing their system, because diverse customer needs should not be deferred or rescheduled again for the next time. This document is dedicated to outlining the criteria for a conceptual view. Thus, to adopt an adaptable enterprise system model, businesses must take them into account in order to acquire an adaptable system, minimizing time and cost while dealing with other enterprise systems in terms of cost and time and budget utilization for construction in order to process and satisfy the request for environment.
	Solutions and utilization, Business environment.

9944	
	AI Based Improved Optimizer for Solving Energy
	Issues
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	ABSTRACT
	In order to distribute energy over a large area, an overhead power line contains
	multiple conductors attached to poles. Transmission line parameters are critical to power system stability analysis and state estimation. By taking into account four different aspects of the problem - dimension identification, exploration controls, improved prey encircling and candidate solution choosing - authors have presented an AI based improved grey wolf optimization (IGWO) method for determining the parameters of the overhead AC transmission lines. Improved grey wolf optimization algorithms for calculating capacitance and inductance per unit length were developed for 3-phase with different bundle conductors. Global or nearly global optimal control variable sets are better served by the IGWO
	methodology than other approaches. Furthermore, the proposed research shows that the or AI based IGWO can compete with existing methods and solve real- world optimization challenges. Because the AI based IGWO algorithms have been enhanced, they are more effective than other methods. It has been statistically proved that the strategy under investigation generated the best possible results for several of these functions. It has been found that the suggested method is computationally faster, more accurate, and more reliable in terms of durability and accuracy.
	<b>Keywords:</b> improved grey wolf optimization; 3-phase; bundle conductors; parameters calculation

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