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Ohmic heating originally utilized widely in food industry to heat liquids and semi-solid foods, as well as in chemical processing and metallurgy. The heating process happened due the electric current passing through a substance, causing it to heat up due to the resistance of the material to the flow of the current. This method of heating is highly efficient and can be used to heat a variety of materials, including liquids, solids, and gases including those materials that are difficult to heat using these other methods. Empty fruit bunch (EFB) has explored as excellent potential feedstock to produce hydrogen gas, as it is a readily available and renewable resource. It mostly due to its good source of cellulose, with a cellulose content that is typically around 40-50% which is important for the production of biogas. The cellulose content of the feedstock can affect the biogas yields, as there is more cellulose available to be broken down by the microorganisms into sugar that are used to produce the biogas. However, EFB also is a highly recalcitrant material, which requires longer time to break down and decompose. This can be a hurdle for biological process and use as a feedstock to produce biofuels or other bioproducts. Therefore, ohmic heater is fabricated in this study to pre-treat EFB for higher cellulose and sugar production that will increase biohydrogen production by dark fermentation. Optimization of ohmic heating parameters were done by Response Surface Methodology for reaction time (5-15 mins), temperature (70-90^{o}C) and percentage of sodium hydroxide solution (1-5% NaOH) used as electrolyte. Lignocellulosic component, sugar, and morphological analysis were carried out to identify the efficiency of alkaline-assisted ohmic heating pre-treatment of EFB for biohydrogen production.

Keywords: ohmic heating, empty fruit bunch, biohydrogen, rsm

INTERNET OF THINGS (IOT)-WIRELESS COMMUNICATIONS FOR UNMANNED AIRCRAFT SYSTEM

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Unmanned aerial vehicles (UAVs), often known as drones, have exploded in popularity in recent years thanks to their usefulness in a wide range of commercial and industrial settings made possible by rapid technological development. UAVs are currently being utilized in several fields, such as farming, filmmaking, law enforcement, aerial photography/videography, and even package delivery. UAVs have various uses, including efficient and rapid surveying of broad regions and access to otherwise inaccessible or dangerous locations. Unmanned Aircraft System (UAS) operations rely heavily on wireless communication technologies. These tools are essential for UAVs to communicate with ground control stations and convey information to operators. The United States' ability to complete missions and other activities would be significantly hampered if this happened. The United States can keep a close eye on its surroundings because of advancements in wireless communication technology (WCT), which is crucial for the success of its missions. Also, assignments that need UAS. to function in hostile or dangerous areas can do so thanks to wireless technology that allows for remote control. Drones' extensive application has raised awareness of the need to upgrade wireless networks in the United States to increase their interoperability, capacity, and broadband connectivity. This research closely examines the most influential wireless communication technologies in this space, detailing their strengths, weaknesses, applicable standards, and potential future research directions for addressing the issues identified.

Keywords: iot, wireless communication, uas, optimization, decision making

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STOCHASTIC LONGTUDINAL AUTOPILOT TUNING FOR BEST AUTONOMOUSFLIGHT PERFORMANCE OF A MORPHING DECACOPTER

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In this conference paper autonomous flight performance maximization of a morphing decacopter is considered by using stochastic optimization approach. For flight controller a PID based hierarchical control system is chosen. In this paper PID controller which is used for pitch angle is considered. In this application only longitudinal flight and longitudinal autopilot is considered where the pitch motion is in primary interest and the used controller is the pitch control. For optimization technique simultaneous perturbation stochastic approximation (i.e., SPSA) is selected. It is fast and safe in stochastic optimization problems when it is not possible to evaluate gradient analytically. At the end a cost function consisting terms that settling time, rise time and overshoot is minimized. A detailed graphical analysis is done in order to better present effect of morphing on longitudinal flight of decacopter flight. Moreover, the cost function consist of rise time, settling time, and overshoot during trajectory tracking.

Keywords: decacopter, stochastic optimization, morphing, autonomous flight performance.

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STOCHASTIC LONGTUDINAL AUTOPILOT TUNING FOR BEST AUTONOMOUS FLIGHT PERFORMANCE OF A MORPHING VTOL DRONE

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In this conference paper autonomous flight performance maximization of a morphing vertical take-off and landing (i.e., VTOL) drone is considered by using stochastic optimization approach. For flight control system a PID based hierarchical control system is applied. In this paper PID controller which is used for pitch angle is considered. In this research only longitudinal flight and longitudinal control system is evaluated during aircraft mode where the pitch motion is in primary interest and the used control surface is the elevator of VTOL drone. For optimization approach simultaneous perturbation stochastic approximation (i.e., SPSA) is chosen. It is fast and safe in stochastic optimization problems when it is not possible to evaluate gradient analytically. At the end of this paper a cost function consisting terms such that settling time, rise time and overshoot is minimized. A detailed graphical analysis is made in order to better evaluate effect of morphing on longitudinal flight of a morphing vertical take-off and landing drone flight. Moreover, the cost function consist of rise time, settling time, and overshoot during trajectory tracking.

Keywords: vtol drone, stochastic optimization, morphing, autonomous performance.

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SAAS MODEL ASSESSMENT- A DEA

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Strong growth in the SaaS (Software as a service) industry is predicted over the next few years due to several factors, including the increasing demand for adaptable and inexpensive software solutions, the popularity of cloud computing, and the rise of mobile work. It is clear to see that, in this research, Data Envelopment Analysis - Bootstrapped Chance-Constrained (DEA-BCC) was used effectively to compare the top 12 SaaS providers, and C3-HubSpot has been ranked as the most efficient company. The research findings provide a comprehensive framework for comparing the efficiency of the leading SaaS providers. With this approach, it could be seen that leaders in various sectors may learn more about the market, identify promising business possibilities, rally behind digital transformation efforts, and encourage widespread creativity. People interested in this field can benefit from the proposed methodology because it provides a valuable tool for evaluating the success of leading SaaS companies.

Keywords: saas model, dea approach , constrained (dea-bcc) , saas providers, decision making

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RENEWAL ENERGY EFFICIENCY ASSESSMENT

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Renewable energy has become an increasingly important trend in recent yearsas the world faces the pressing challenge of addressing climate change and reducing dependence on fossil fuels.Renewable energy sources,such as solar,wind,and hydroelectric power,are considered sustainable and non-polluting options for meeting energy needs.Integrating renewable energy sources into the energy mix can bring economic benefits,such as job creationand economic growth in rural and remote areas. In this study, Data Envelopment Analysis (DEA) Malmquist analysis was used to assess the potential for renewable energy production in 10 nations. Three inputs (population, total energy consumption, and total renewable energy capacity) and two outputs (energy consumption and the percentage of renewable energy capacity) were used in the analysis (gross domestic product and total energy production). Canada, Denmark, Finland, Germany, Japan, the Netherlands, New Zealand, Norway, Sweden, and Switzerland were also part of the study. This study's findings offer policymakers and investors a comprehensive framework for assessing the potential for renewable energy generation in various countries. They can help move the needle on adopting renewable energy regulations. The suggested methodology provides a valuable resource for assessing different countries' renewable energy production potential, which can help inform future policy decisions.

Keywords: mcdm, renewal energy , data envelopment analysis , malmquist analysis , decision making

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PROPERTIES EXPERIMENTAL ANALYSIS BIO-MONOGRADE ENGINE OIL: PART 1 - BLENDED MONO-GRADE ENGINE OIL SAE 40 WITH FRESH COCONUT OIL

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Mono-grade engine oil is the engine oil on the market and this engine oil has the lowest properties compared to multi-grade and synthetic engine oil. Mono-grade engine oil does not have viscosity index improving (VII) properties because it cannot be added polymer additive. Coconut oil is a vegetable oil produced from coconut milk that contains high fatty acids. The main objective of this study is to determine the effectiveness of fresh coconut oil being added to SAE 40 mono-grade engine oil by a different mixture composition. In this study, density, viscosity, kinematic viscosity, and viscosity index (VI) number is a measurement by using SVM 3000/G2 equipment. The engine oil used in this study is Petronas Mach 5 SAE 40 API SF mono-grade engine oil and fresh coconut oil is homemade manufactured. The results of the study show that the density and VI of the bland mono-grade engine oil increase but decrease in dynamic viscosity and kinematic viscosity concerning the percentage of fresh coconut oil mixture.

Keywords: engine oil, coconut oil, mono-grade engine oil, viscosity index, precentage of fresh coconut oil

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OPTIMIZATION OF PROCESS PARAMETERS FOR METHANE PRODUCTION FROM ANAEROBIC CO-DIGESTION OF PALM OIL MILL EFFLUENT AND SUBCRITICAL WATER PRE-TREATED EMPTY FRUIT BUNCHES

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The goal of the current work was to optimize and model the methane yield from anaerobic digestion subcritical water pre-treated palm oil empty fruit bunches (EFB) using response surface methodology (RSM). The influence of subcritical water pre-treatment parameters such as temperature, reaction time and the water-to-solid ratio was investigated for cumulative methane yield, the removal percentage of volatile solid content (VS removal), sugar production, and lignin content. The results showed that RSM with central composite design (CCD) was successfully applied to predict and model the methane yield from subcritical water pre-treated EFB. From the analysis of variance (ANOVA) results, the obtained models were highly significant with coefficient values (R2). The results indicated that the obtained quadratic models are significant for the selected responses, as well as acceptable for the relationship between the investigated parameters and the responses. The optimum conditions of the investigated parameters were found by the numerical analysis method based on RSM. The optimum ranges were extracted for the desirability levels with values greater than 0.9 (maximum desirability value).

Keywords: optimization, methane, palm oil mill effluent, empty fruit bunch, anaerobic digestion

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SOME ENGINEERING PROPERTIES OF PINEAPPLE FRUIT(ANANAS COMOSUS VAR. MD2)

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Pineapple is a tropical fruit that is highly relished for its unique aroma and sweet taste. In contrast to other tropical fruits, pineapples typically feature medium-sized fruits with yellow flesh. Based on the physical properties of pineapple fruit variety MD2 such as dimensions, geometric mean diameter (D_g), arithmetic mean diameter arithmetic mean diameter (D_a), surface area, volume, sphericity, aspect ratio, and projected area and the best-fit mass models have been determined. From the result obtained, the physical properties such as length, thickness, width, D_g, D_a and circumference were found to be 217.8mm, 132.7mm, 132.9mm, 156.5mm, 161.2mm, 394.3mm respectively. Meanwhile for the aspect ratio, mass, volume surface area, sphericity and projected area perpendicular to dimension namely PA_L, PA_T, AND PA_W were found to be 0.61, 1730.4g, 1420 cm^3, 77107.4 mm^2, 0.72, 22746.0 mm^2, 13942.9 mm^2, and 16866.3 mm^2 respectively. For all physical properties except volume, the best fit mass model to predict mass of pineapple fruits was the quadratic model. Additionally, the findings demonstrated that, in comparison to other attributes, the mass model based on actual volume was more appropriate, with the highest determination coefficient (R^2) for Quadratic and S-curve model. For developing and optimizing machinery for handling, maintenance, distribution, and storage, the mass model of pineapple fruits according to the actual volume in the outcomes is relatively important.

Keywords: pineapple, physical properties, fruit, mass model

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SOME PHYSICAL PROPERTIES OF LONG GRAIN PADDY (ORYZA SATIVA) AS A FUNCTION OF MOISTURE CONTENT

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Understanding the physical qualities of cereal grains is necessary when constructing handling and processing equipment. However, there is still a shortage of understanding about the impact of moisture content on physical properties, particularly in relation to processing designs such as the soaking parboiling process. The new long-grain rice variety MR297 has gained popularity in Malaysia due to its resistance to rust disease. The moisture content of paddy can affect the physical transformations of MR297 long grain. This study evaluated the moisture-dependent physical characteristics of several Malaysian MR297 paddy cultivars at various moisture contents (16.49% - 34.08% wet basis). The measured physical properties included length, width, thickness, aspect ratio, arithmetical mean diameter, equivalent mean diameter, geometrical mean diameter, sphericity, surface area, volume, and thousand kernel weight. Using linear regression models, the relationships between the physical characteristics of the MR297 rice cultivar and its moisture content were accurately expressed. Our results suggest that increasing the moisture content of grain particles changes their physical properties. To prevent kernel injury and maintain equipment capacity during processing and handling, equipment design parameters that include paddy soaking should account for the changes in physical properties during processing.

Keywords: moisture content, physical properties, oryza sativa, long grain paddy

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ALTERNATIVE AVIATION FUEL TYPES USED IN AIRCRAFT ENGINE

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Air transportation is a preferred mode of transportation due to the fastest of methods transport. In this respect, air transport in terms of passengers and freight has been increasing continuously since the 1970s. Due to the increasing number of aircraft and flights, the demand for aviation fuel also increases. Jet engines and auxiliary power unit (APU) are the two main sources of aircraft emissions as they use fuel. Aircraft engine emissions have not received as much attention as emissions from other energy sources until recent years. However, the International Civil Aviation Organization (ICAO) has set limits for commercial jet engines in respect to nitrogen oxides, unburned hydrocarbons, carbon monoxide and smoke emissions. These limitations were determined for a specified landing and take-off cycle (LTO) to limit emissions near ground level as well as indirectly limit emissions at altitude. The world's carbon dioxide emissions of 2%, originate from air transportation. In order to reduce greenhouse gas (GHG) emissions, especially carbon dioxide emissions, the use of alternative fuels instead of fossil fuels is increasing in aviation transportation. In this study, it is aimed to examine the use of alternative aviation fuel types produced by different methods in aircraft engines.

Keywords: aircrafts, kerosene, vegetable oil, sustainable aviation fuels, emissions

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A PROPOSED CONCEPTUAL DESIGN FOR A COMPUTER BASED AMBULANCE SYSTEM IN LIBYA USING IOT

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Due to the increase in the world's population which increased road congestion, the ambulances that carry patients have so many difficulties in getting to the hospital before the patient's condition gets worse. The problem of the delayed arrival of the patient to the hospital was found globally in most countries. Especially in Libya, the problem is more complex, the ambulance services are weak, patients face problems in getting fresh blood packages, and the health system lacks an electronic health record. In this paper, a descriptive comparison is conducted to evaluate, compare, and analyze different proposed solutions. Then, a new different solution is proposed using IOT technology. To check the feasibility of the newly proposed solution, a survey was conducted to review the audience's level of satisfaction with the traditional ambulance services, as well as the proposed solution, the results showed the people's lack of trust in the current ambulance services, and their reluctance to rely on the service. However, the results also revealed the people's acceptance of the proposed solution, and their willingness to rely on it

Keywords: ambulance system, libya, healthcare system, iot

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CHICKEN VACUUMING LICE CLEANING SYSTEM

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The use of chemical pesticides in the fight against Dermanyssus gallinae mite has a crucial place in all poultry farming, especially in raising chickens. Since the mite is in a constant state of reproduction, continuous spraying must be done. Until now, no effective option other than this chemical control approach has been found. The problem has a surpassingly greater effect on human and chicken health than predicted. While fighting this bloodsucking ectoparasite, licensed and unlicensed chemical drugs are used unconsciously all over the world. Unfortunately, human health is not considered at all. People think that are getting the nutrition they need and being healthier by eating the meat and the eggs of animals such as chickens and turkeys, however they simply consume poison. Turkey is among the top 10 countries in the world with the number of chickens reaching 379 million in the poultry industry. Therefore, Dermanyssus VakumlaMAX system, which is able to destroy Dermanyssus gallinae ectoparasite with a physical control method, without requiring any harmful chemicals, has significant importance for both human health and export sector. Dermanyssus VakumlaMAX system is a new product to be used for the first time in the world that allows fighting with the mites without harming the poultry and without leaving any residue on meat or eggs. The system has a high effect area, cost-effective and simple to use. A 99% success rate is achieved in one-year experiment within the control group of chickens.

Keywords: human health, technology design, animal health

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GSM, BLUETOOTH AND WIFI-SMS MODULE CONTROL HEADER

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The biggest reason why education and training activities cannot be carried out in a healthy way at all levels of schools is the inability to adapt classroom management to the conditions of today's age. Due to the deterioration of teacher-student communication, an effective learning environment has become unsustainable for many reasons. Among these reasons: crowded classrooms, unsatisfactory education curriculum for students, the fact that twelve years of compulsory education could not be accepted by a large number of students and families, a system based on exams was mandatory, social and cultural activities were almost non-existent there is to be. For these reasons, education has come to a standstill, especially in high schools.rnrnIn order to ensure the functionality of the classroom rules and to provide a learning environment in the classroom, it is necessary to focus on the learning motivation of the student and make it selective. Only in this way will the student be prevented from disrupting the classroom order, speaking and making unnecessary movements, and as a result, a healthy classroom management will emerge. Until now, there is no system that detects the regular-irregular movements of the student in the classroom and notifies the student's parents instantly via GSM. GSM, Bluetooth and Wifi-SMS module control header is a new technological educational material designed and developed for the first time, which will be applied for the first time in the world, which eliminates student behavior disorders in classroom management by coordinating with parents at the same time, enabling them to listen to the lesson better, and saving the teacher from a passive role and creating an effective classroom environment.rnExperimental and control groups were formed with 40 high school students and 8 teachers, and the GSM, Bluetooth and Wifi-SMS module control header training material was tested for one year.

Keywords: header, gsm, bluetooth, school

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DATA CLEANING IN MEDICAL PROCUREMENT DATABASE: PERFORMANCE COMPARISON OF DATA MINING CLASSIFICATION ALGORITHMS FOR TACKLING MISSING VALUES

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Data cleaning is an important process for improving the quality of decision-making information. One of today's popular cleaning tools is data mining techniques. In this paper, we focus on using data mining classification algorithms to resolve missing values in medical purchasing databases. To serve this purpose, the predictive performance of four different classifiers: Decision Tree, Naïve Bayes, K-Nearest Neighbor, Support Vector Machine (SVM) are compared in this study. We use 2,311 medical data records from procurement database in Thailand between July 2019 and December 2019 in the experimental process. We also discuss the functions of feature selection and test options that support analysis to improve model performance and reduce errors. Our study results show that the SVM algorithm outperforms with a maximum accuracy of 89.61%. Additionally, we discuss the strengths and weaknesses of these data mining techniques for data cleaning. The findings could benefit the medical procurement system and for future research.

Keywords: data mining techniques, classification algorithms, medical procurement database, missing values

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MULTI-TOPIC CONTROLLABLE TEXT GENERATION WITH KEYWORDS

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Today, applications developed on Natural Language Processing (NLP) have become very important. One of the most popular research areas in this field is Controllable Text Generation. The purpose of controllable text generation is to create some controls like style, topic, etc. on the automatically generated text instead of being random. In this study, in order to generate topic-controllable texts in Turkish, we design a language model that uses a GPT single-block transformer decoder. We first identify the topic keywords according to the TF-IDF scores of the words in each topic. Then, we append the topic name and topic keywords to each prompt so that the model can learn better about the requested topic. Thus, the model uses the most essential information related to that topic as an augmented input during the training. Lastly, we design and train a multi-class text classifier to measure whether the generated text is on the desired topic. In the experiments, for the generated text, we obtain BLEU scores around 0.10 and BERTScore about 0.43. In addition, the trained text classifier identifies 76% of the topics in the generated text samples as the desired topic classes. These initial results indicate the success of the proposed text generation method.

Keywords: text generation, controllable text generation, topic-controllable text generation, natural language processing

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FABRICATION OF HOLLOW FIBRE NANOCOMPOSITE MEMBRANE AUGMENTED WITH FUNCTIONALIZED HEMATITE NANOPARTICLES FOR THE REMOVAL OF BISPHENOL S FROM AQUEOUS SOLUTION: FOULING AND PERMEABILITY STUDIES

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Abstract Fouling has remained a significant bottleneck regarding the application of membrane technology in water purification systems. Herein, a hydrophilic composite polyvinylidene fluoride (PVDF)-polyethylene glycol (PEG) hollow fibers membranes were developed, incorporating hematite nanoparticles. The PVDF-PEG neat and nanocomposite membranes transformed with Fe_2O_3 NPs at varying loadings of 1.0 wt%, 1.25 wt%, 1.5 wt%, and 2.0 wt% were successfully fabricated via the dry–wet-spinning procedure and spun via phase inversion technique. The resultant neat and nanocomposite membrane fibers were analyzed and compared based on the surface zeta potential, SEM/EDX, AFM, contact angle, and porosity. The performance of the membrane fibres was investigated based on permeation fux, BPS rejection, as well as antifouling behaviour. Based on the study findings, the resultant nanocomposite membrane fibres demonstrated superior performance as compared to the neat membrane fibre. The flux, resistance to fouling, and BPS rejection were augmented with the functionalized Fe_2O_3 NPs loadings. Also, the nanocomposite membrane modified with 1.5 wt%-Fe_2O_3 NPs presented a remarkable performance with negatively charged zeta potential (−47.3Mv), least contact angle (49.3º), water permeation flux (185.37 L/m^2 h), BPS rejection (92.19%), and minimum weight loss (12%) respectively. Furthermore, the 1.5wt-Fe_2O_3 NPs nanocomposite membrane exhibited superior antifouling performance after the third fltration, accomplishing a higher percent of FRR (80.57%) along with RFR of 20.4%, respectively. Thus, based on the performance of the hollow-fibre membranes loaded with functionalized Fe_2O_3 NPs, effective antifouling membranes was achieved which can be suitably considered in the purifcation of industrial wastewater.

Keywords: bisphenol s, permeation flux, hematite nanoparticles, antifouling, nanocomposite membrane.

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OPTIMAL POSITION OF TWO FANS COOLING A LARGE PV PANEL

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To overcome the negative effect of the rise in temperature of photovoltaic (PV) panel on its performance, cooling is used. However, this cooling must be as homogeneous as possible. Indeed, the uniform cooling of a photovoltaic (PV) panel is important to maintain its conversion efficiency at a high level. In this work, a cooling system is proposed using two fans that blow ambient air onto the backside of the PV panel. Different configurations of fans positions (air inlets) and air outlets are studied by simulations in order to optimize the cooling system and to achieve a uniform temperature distribution on the PV panel. On a typical summer day with an optimal air flow rate of 200g/s, the optimized cooling system reduces the temperature of the PV panel by 21.66°C and improves its conversion efficiency by about 8.85%. In the absence or at low wind speeds, these values can reach 35.84°C and 16.5%.

Keywords: efficiency, fan, homogenization, temperature field, photovoltaic panneal

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GREEN HYDROGEN FROM A PV-SUPPLIED SONO-ELECTROLYSIS: MODELLING AND EXPERIMENTAL INVESTIGATIONS OF THE MECHANISM AND PERFORMANCE

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Water and energy are the two most essential assets for a sustainable global human society. However, the high carbon footprint and global warming effects caused by non-renewable sources have made energy transition a key element to ensure sustainable development. Currently, hydrogen produced from water supplied by renewable energy is considered an ideal and sustainable energy carrier for the future. Herein, we investigate experimentally and theoretically using MatLab modeling the production of hydrogen via PV supplied alkaline electrolysis of water coupled to 40 kHz ultrasonic bath. Nickel plates and nickel foam were used as electrode's material immerged in 25% of KOH electrolyte while a 12V solar panel was used as a green source of power supply. The experimental and the modeling results related to the ultrasounds effect on hydrogen production efficiency showed a high agreement. The integration of ultrasounds demonstrated a reduction in electrodes coverage by bubble by around 54,8%, which was equivalent to a gain of 3,35% in the energy efficiency according to experiments.

Keywords: sonoelectrolysis, green hydrogen , solar hydrogen , ultrasound

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COMPREHENSIVE MODELING STUDY OF THE ELECTRICAL PERFORMANCE OFA SONO-ELECTROLYZER UNDER A VOLTAGE AND CURRENT SOURCES SUPPLY: FROM GREY TO GREEN HYDROGEN

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Hydrogen production from water electrolysis is seen as a promising technology to produce hydrogen with high purity of 99.99%. However, the increase of the ohmic resistance in the electrolyte remains a challenge for the electrolytic technique. In the present work, we study the transition from grey hydrogen to green hydrogen using alkaline electrolysis (25% w/w KOH solution electrolysis). We compare hydrogen production efficiency using a voltage source simulating the conventional DC generator, and a current source simulating the PV power supply. Water electrolysis was coupled to an indirect ultrasound source in order to investigate its effect on hydrogen production process in both cases of power supply. The question was tackled experimentally using an H-cell electrolyzer and an ultrasonic bath, and numerically using a MatLab code. Energy conversion efficiency and hydrogen production rate were determined both experimentally and through simulation. It was demonstrated that the integration of sonication reduces the ohmic resistance within the electrolyzer and thus decreases the cell voltage for the same current, which enhances the energy efficiency in the case of current source for the same hydrogen production rate. For instance, an enhancement of 3.10-10.97% was recorded in the energy efficiency using a current source of energy, which was equivalent to 3.19-4.75% in the case of voltage source. Therefore, the coupled of sono-electrolysis process to solar PV seems to be a promising pathway for an environmentally friendly hydrogen production technique.

Keywords: conventional electricity , hybrid hydrogen , water electrolysis, solar pv , matlab modeling

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COMPUTER-AIDED PLANNING OF RADIAL AND DIAMETER ROUTES IN LOCAL PUBLIC TRANSPORT NETWORKS

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Local public transport network planning is a complex procedure affected by many aspects (e.g. city structure, travel needs, the budget for the service, vehicle types, service frequencies, timetable optimization of parallel routes etc.). Due to the high number of possible solutions, finding the optimum is usually a problem with NP computational complexity. Although an extensive toolkit is available for evaluating specific networks, the number of versions that can be realistically examined and compared is highly limited. This implies that the routine and creativity of the network planning specialists play an important role in the selection of the examined networks. However, in some special cases, the search space can be narrowed so that all network versions can be automatically generated and compared. This paper presents such a case: when applying radial and diameter routes, the main question is which directions should be connected to each other as a diameter route or left alone as a radial line. The algorithm is presented on the example of the city Győr.

Keywords: public transport, local public transport network, radial routes, diameter routes, computer-aided planning

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ROUTE CHOICE PREFERENCES OF PUBLIC TRANSPORT PASSENGERS IN DIFFERENT CITIES

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In public transport network planning, it is essential to know the demands as well as the decision-making aspects of the passengers. A special timetable information and journey planning application has been developed and applied in 17 cities with different sizes and structures in North West Hungary since 2016 which is also able to collect and utilize the decisions of the users. Based on the collected real-life decision data, different logit models have been built for the different cities as well as for different age groups of the passengers. The examined variables are basically the time equivalents for transfers, walking and waiting phases of the journeys. This paper presents the main experiences of this project and the comparison of the decision models constructed so far. Results show clearly the differences between passenger layers of different cities and different ages in many cases, especially in larger cities where a higher amount of data is already available.

Keywords: public transport, passenger preferences, urbanization, route choice

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THE ROLE OF PUBLIC TRANSPORT IN TRANSPORT SAFETY AND PUBLIC SAFETY

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Public transport has a significant role in sustainable urban transport including the reduction of congestion, noise and air pollution. The main purpose of this paper is to present other important impacts of public transport i.e. the improvement of transport safety and public safety, too. Public transport is one of the safest transportation modes according to the indication numbers in traffic accident and injuries. This phenomenon is illustrated through literature research as well as statistical data. Further opportunities are presented with a case study based on the transport system of the city of Győr, especially the positive impacts of the possible expansion of night public transport services. The severity of traffic accidents at nights is significant, and the enhancement of public safety is outstanding. Marketing is one of the most important tools for attitude formation, the paper contains some suggestions in this regard as well in order to promote the goals above.

Keywords: public safety, public transport, traffic safety, sustainable mobility

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A QUANTITATIVE BLOCKCHAIN-BASED MODEL FOR CONSTRUCTION SUPPLY CHAIN RISK MANAGEMENT

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Although the use of Blockchain Technology in construction industry has been limited, nowadays several cases of adoption of this technology in construction sector can been identified. Such examples consist of maintaining digital asset records, timestamps for contracts or transactions, multiple signature transactions, smart contracts, and the repository of real information. This paper proposes a methodology consisting of a Electre Tri multi-criteria analysis method where a list of indicators and a questionnaire are used to fill a model that can be applied to evaluate the suitability of blockchain technology as a tool to mitigate supply chain risks that small and medium enterprises face in the construction industry. The model has been applied to two companies operating in the construction industry. This study contributes to the existing literature by quantitatively assessing the adoption of blockchain technology on two real case studies – company Alpha and company Beta – to limit supply chain risk in the construction sector. The dimensions considered in the analysis are company data, payments, materials, supply chain structure and information and document flow. According to the findings, the model suggests that for company Alpha blockchain technology is recommended but not useful to mitigate risks and so improving supply chain performance. On the contrary, results show that for company Beta the implementation of blockchain technology is useful.

Keywords: supply chain management, blockchain technology, construction industry

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POSSIBILITIES TO CONSTRUCT COMBINED MINE WASTE DUMP FACILITY WITH BETTER OPERATIONAL SEQUENCE

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An integrated mine waste facility is designed for the Khan Krum deposit in Bulgaria (Eldridge et al., 2011). A substantial environmental benefit was achieved by designing such a facility because constructing a conventional tailings storage facility (TSF) would've needed much more surface area. However, the paper from (Eldridge et al. 2011), is mentioned that achieving a good operational sequence for constructing the facility would be a challenge. This paper evaluates how choosing the proper form for the combined mine waste dump facility (CMWDF) can help in having better control over the operational sequence. For comparison, two designs of CMWDF were designed. Each can accumulate the predicted amount of tailings the processing plant will produce. The first design has a broader construction body, and the other is narrower. It was decided like so because the broader body ensures more cells which means a better operational sequence can be achieved. Also, a conventional tailings facility was designed to compare the surface area and volume of waste rock needed for construction. All the designed Tailings Storage Facilities (TFS) require different surface areas and waste rock to be built.

Keywords: tailings storage facility, tailings deposition, operational sequence

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IMPROVED TAILINGS CONSOLIDATION USING DEWATERING AGENTS: A STEP TOWARDS SAFER AND SUSTAINABLE MINING WASTE MANAGEMENT

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Tailings consolidation is a critical step in mining waste management. Tailings are a byproduct of mining and mineral processing operations, and they are typically composed of finely ground rock particles, water, and reagents used in the mineral processing. The tailings disposal is a significant environmental and safety concern, as unconsolidated or unstable tailings can result in catastrophic failures and environmental damage. Therefore, it is crucial to use reagents for tailings consolidation to ensure the stability and safety of tailings storage facilities (TSFs). That is the reason to decide to test different dewatering aids to determine which one gives the best results in tailings dewatering. Many experiments were carried out using the reagents Aerodri 104, Aerodri 105, PEG – 400, and polyvinylpyrrolidone K30 and K90. Factors such as water release, consolidation speed, and consolidation time were considered and monitored. The best results are obtained with the Aerodri 104 using 300 g/t and 500 g/t reagents.

Keywords: tailings consolidation, tailings dewatering, flocculants, tailings disposal

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FROM HUMAN TO ROBOT INTERACTION TOWARDS HUMAN TO ROBOT COMMUNICATION IN ASSEMBLY SYSTEMS

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The interaction between humans and robots has been a rapidly developing technology and a frequently discussed research topic in the last decade, because current robots ensure the physical safety humans during close proximity assembly operations. This interaction promises capability flexibility due to human dexterity skills and capacity flexibility due to robot accuracy. Nevertheless, in these interactions, the humans are marginally outside of the system while the robots are seen as a crucial component of the assembly activities, which causes the systems to lack flexibility and efficiency. As a result, this article proposes a future mode of human-robot interaction in which a skilled operator performs not only physical cooperative tasks with robots but also work aided by smart technologies that allow communication with robots.We conducted a systematic review of related literature and industrial applications involving human and robot interaction modes over the last decade to identify research gaps in the integration of collaborative robots into assembly systems. We believe that we are in a transformation phase from physical interaction mode towards cognitive interaction mode between humans and robots, where humans and robots are able to interact with each other during mutual working conditions and humans are able to guide robots with speech, gesture recognition, and other multimodal techniques instead of coding the robots during assembly operations. The authors of this paper believe that this mode of interaction allows for an increase in the flexibility and productivity of the assembly operation and as well as the wellbeing of the human operator in a human-centered manufacturing environment.

Keywords: human robot communication, assembly operations, industry 4.0, industry 5.0

QUALITY EVALUATION OF WEB-BASED ACADEMIC PORTAL USING EYE TRACKING METHODOLOGY: A STUDENT PERSPECTIVE

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An essential aspect of a website is web usability, which enables users to find information quickly and easily. In contrast to surveys, eye-tracking data collected while performing tasks enables a more objective evaluation of web usability. Through the analysis of eye-tracking data using both qualitative and quantitative methodologies, we perform a usability assessment study of the e-services offered to students through the academic portal of Zayed University in this work. We investigate the viewing, searching, and navigating habits of young Arab female students as they interact with the academic portal at the institution, as well as the variables that affect their searching habits. The study focuses on the student's visual and viewing behaviours and how they make their first decision to use an e-service (click). The complexity of the portal's interface elements could be determined by analyzing the combined heat maps. According to the study's findings, students typically spent more time browsing the e-services homepage to discover the appropriate link for the desired service. Additionally, the results of the heatmap analysis revealed that most of the students' visual behaviour during task completion was intensive, disorganized, scattered, and erratic. Several user interface design flaws were discovered, which have an effect on students' productivity in terms of finishing tasks and general satisfaction. From the viewpoints and expectations of the students, a set of recommendations were made to enhance the usability aspect and design of the ZU main portal. The results of this study can help university web designers of academic e-services present and build university portals effectively and in accordance with the needs, preferences, and expectations of the students based on student-based usability assessment

Keywords: academic portal; student e-services; usability testing; eye tracking technology; heat map analysis

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EMBRACING GREEN CHOICES: SENTIMENT ANALYSIS OF SUSTAINABLE CONSUMPTION PATTERNS AND ATTITUDES

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Currently, resource scarcity and climate change are among important global problems. Governments are actively seeking regenerative solutions so that humans and nature can coexist in harmony in the face of ecological destruction and resource constraints. One of these solutions is green consumption. Making greener consumption decisions is necessary for society to become sustainable. If sustainable consumption is to be promoted, public perception must shift, and achieving this shift will be simpler if society's shift toward green consumption is understood. This research aims to explore the sentiment and attitudes towards sustainable consumption on YouTube, a popular online platform with a vast pool of user-generated content. We employ a combination of data mining techniques and sentiment analysis to process and analyze a large dataset of YouTube videos and comments related to sustainable consumption topics. The data collection includes videos from various categories such as eco-friendly product reviews, sustainable living vlogs, and informative content on environmentally responsible practices. The study focuses on understanding user engagement, sentiment polarity, and the factors influencing positive or negative attitudes towards sustainable consumption. In this way, the attitude of society towards green consumption and the role of social media on public opinion can be understood. Overall, the study shows how data mining techniques and social media have the potential to help with the shift to more sustainable growth pathways.

Keywords: sustainability, green consumption, sentiment analysis, data mining, social media

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INTELLIGENT SOLAR-POWERED SOLID WASTES SEGREGATOR OF BIODEGRADABLE AND NON-BIODEGRADABLE WASTES

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With the increasing global population size, waste production has been rapidly increasing in parallel which brought imbalance in the ecosystem. The control of waste products in urban and rural areas is of great significance to maintaining a stable and hygienic living atmosphere. The project aims to design and develop a prototype of an intelligent solar-powered solid waste segregator machine. The design provides a solar-powered solid waste segregator with an application of artificial intelligence. It comprises an ultrasonic sensor that is responsible for detecting the wastes in order to make the whole machine operate and process, an AI camera that will thoroughly scan the wastes, and lastly, a steel plate that will put the wastes into their respective bins. Furthermore, it is for a small-scale implementation in which the prototype can be tested in any household or facility, putting the waste one at a time. The capacity of the machine is about 12-gallon to 16-gallon with particular classifications of wastes to be detected and segregated. Non-biodegradable wastes are plastic bottles, glass bottles, and aluminum cans, and biodegradable wastes are paper cups, and the peel of bananas, oranges, and calamansi. On the contrary, the system cannot detect and segregate liquid, gaseous, and chemical wastes. The data and results were gathered based on the actual simulation and testing of the prototype. Using a 1080p web camera and Region-based Convolutional Neural Network (R-CNN) for test simulation, the design has an accuracy that ranges from 57% to 93%. In addition, the design correctly classified 591 wastes out of 641 mixed wastes fed into the machine for an average time of 21.80 minutes, generating an average processing rate of 29.4053 waste per minute.

Keywords: solid waste, biodegradable, non-biodegradable, r-cnn, solar power

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IMPROVEMENT OF SOLUTION USING LOCAL SEARCH OPERATORS ON THE MULTI-TRIP ELECTRIC VEHICLE ROUTING PROBLEM BACKHAUL WITH TIME WINDOW (MT-EVRPBTW)

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In order to reduce greenhouse gas emissions, logistics companies are strongly encouraged to make their operations more environmentally friendly through efficient solutions by implementing electric vehicles (EVs). However, the driving range is one of the aspects that restricts the introduction of EVs in logistics fleets as it poses new challenges in designing distribution routes. In this regard, this paper investigates the issue of the Electric Vehicle Routing Problem (EVRP) raised by logistics companies in real time. There are many models that extend the classic VRP model to consider electric vehicles, but VRP by combining the features of capacity VRP, VRP with time window, backhaul VRP, multi-trip VRP, and electric VRP (MT-EVRPBTW) has not been worked out yet. We present a mathematical model of the MT-EVRPBTW to explain the problem in detail with the objective function to minimize the total distance travelled, where each vehicle could be charged nightly at the depot and during the day at the rest time of the driver in the depot. A feasible initial solution is built using a constructive heuristic to solve this problem, namely, the sequential insertion heuristic, which will be done by improving the solution using local search operators. Several local search processes using inter-route and intra-route operators for improvement solutions are tested and compared to their performance in measuring the impact of local search operator usage on overall travelled distance. Computational experiments for five local search operators will be presented and analyzed based on data from one of Indonesia's post and parcel companies.

Keywords: electric vehicle routing problem, backhauls, multiple trips, time window, local search operator

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IMPROVING THE SUPPLY CHAIN - MARKETING INTERFACE, TRANSLATING THE VOICE OF THE CUSTOMER INTO OPERATIONAL PROCESSES

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The aim of this paper is to develop and test a framework for leveraging the supply chain-marketing interface to deliver customer value through a standardised closed-loop customer feedback strategy. The manuscript begins with an extensive literature review in the fields of both marketing and supply chain, resulting in a framework that defines a systematic process to deliver customer value by creating synergy between the two fields. This framework is then validated through empirical activities at Company Beta. Regarding the findings, it appears that the application of the conceptual framework, endorsing the importance of closed-loop customer feedback, strongly highlights the role that a supply chain-marketing interface plays in delivering customer value. Nonetheless, there are some necessary prerequisites and contextual variables that must be taken into consideration to ensure a successful implementation of the framework. Since the framework validation is based on a single case study, results cannot be generalized. The preliminary results suggest that a contingent approach is necessary to adapt the framework to different company contexts, which paves the way for future research on the topic. Existing studies address ways in which companies should restructure to support the integration of marketing and supply chain, and researchers are in harmony that the integration can contribute to company success. As of yet, there is no comprehensive guide for the inter-functional activities needed to leverage the supply chain-marketing interface towards customer-centricity and customer value creation.

Keywords: voice of the customer, customer-centricity, marketing automation, supply chain management, supply chain-marketing interface, perations management

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PROBABILISTIC PIECEWISE OPTIMIZATION MODEL FOR INTEGRATED SUPPLIER SELECTION AND PRODUCTION PLANNING PROBLEMS INVOLVING DISCOUNTS AND PROBABILISTIC PARAMETERS: SINGLE PERIOD CASE

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In manufacturing and retail industries, supplier selection problems deal with allocating the optimal raw material amount that should be purchased to each supplier such that the procurement cost is minimal. Meanwhile, production planning problems deal with maximizing the product amount to be produced. Decision-makers need to take optimal decisions for those problem to gain the maximal revenue. In this paper, a novel mathematical model in the class of probabilistic piecewise programming is proposed as a decision-making support that can be used to find the optimal decision in solving both integrated supplier selection and production planning problems involving discounts and probabilistic parameters. The objective is to gain the optimal performance of the supply chain, i.e., maximizing the profit from the production activity. The model covers multi-raw material, multi-supplier, multi-product, and multi-buyer situations. Numerical experiments were conducted to evaluate the proposed model and to illustrate how the optimal decision is taken. Results showed that the proposed decision-making support successfully solved the problem and provided the optimal decision for the given problem. Therefore, the proposed model can be implemented by decision-makers/managers in industries.

Keywords: decision-making support, discounts, piecewise-objective, probabilistic optimization, production planning, supplier selection

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DESK ANALYSIS OF CRISIS COMMUNICATION OF PUBLIC AUTHORITIES DURING THE CRISIS

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Communication of public authorities during a crisis is an essential and indispensable part of any response to a situation that can threaten life and property, and a special opportunity for communication is provided by social media, which, according to research, is the main source of news. At the time of the COVID-19 pandemic, the media once again showed their significant role, and since Facebook continues to lead as a source of news compared to other social media, in this research, the posts of the official Facebook profile Koronavirus.hr were observed as the official website of the Government of the Republic of Croatia for all information and news related to the coronavirus. This paper deals with proving the connection between published news on the official Government profile and social reactions. Using the desk analysis method, the contents of the announcement about the number of sick/newly ill patients, the size of the announcement, the type of image/video content and the connection with reactions on social networks were retrospectively analyzed. Publications through four pandemic waves and a total of 12 periods defined by the number of patients were analyzed. From the total number of announcements in the observed periods (n=300), a total of (n=91) announcements whose content corresponded to the number of patients / new patients were analyzed. The results showed that the continuous publication of similar and/or the same textual and/or image content, as well as the duration of the video content, adversely affects the reactions of the readers, regardless of the information about the number of patients / new patients in the publication. This research can contribute to the future creation of announcements by public authorities on social media in similar crisis cases and provides a basis for further research.

Keywords: crisis communication, public information, social media, covid 19

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RESEARCH ON MEDIA PRESENTATION AND PUBLIC REACTION TO THE FIRST DIGITAL ASSISTANT IN CROATIA

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Many services have undergone a digital transition since the COVID-19 outbreak. The pandemic itself poses a lot of difficulties and has a significant impact on the health system. It is becoming increasingly important to provide high-quality healthcare that health-focused applications and chatbots (also known as "healthbots") collect accurate health information from reliable sources. Chatbots have been used in more than thirty different nations solely in connection with the epidemic. However, there is little information about how the general population views these health-care robots. Investigating how the first health robot in Croatia, Andrija, was shown in the media during the COVID-19 outbreak, this study contributes to this area. Using the study matrix from the article "Chatbot use cases in the COVID-19 public health response" by P. Amiri and E. Karahann, published in the Journal of the American Medical Informatics Association, we looked at the health chatbot used in Croatia. We paid special attention to the components of the chatbot design and the media presentation of the project because they were crucial for the promotion of the healthbot. Reactions and comments from the public on Facebook were the focus of the second part of the research. This chatbot was made very quickly because it needed a quick response. As a result, the design is incredibly simple and focuses on several simple activities that use system-oriented efforts. In conclusion, easy use and rapid dissemination of information offer additional services that can ease the workload of medical staff in situations where there is a higher demand for access to basic healthcare. The adoption of health chatbots is challenging in terms of social and technological systems (design and usability). Future media presentation strategies should include more complex and sophisticated chatbot designs, as well as the potential for synergy with machine learning.

Keywords: healthbot, media presentation, social media, covid 19

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PRESENTATION ON IT FUNDAMENTALS OF CYBER SECURITY

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Computer security, cyber security [1] or information technology security (IT security) is the protection of computer systems and networks from the theft or damage of hardware, software or electronic data, as well as from the disruption or misuse of services that they provide. The field is becoming even more important due to the increased use of computer systems, the Internet [2] and wireless networking standards such as Bluetooth and Wi-Fi, and the rise of "smart" devices, including phones. smartphones, televisions and various devices that make up the "Internet of Things". Due to its complexity, both in terms of politics and technology, cyber security is also one of the main challenges of the contemporary world. [3] A vulnerability is a weakness in design, implementation, operation or internal control. Most of the vulnerabilities that have been discovered are documented in the Common Vulnerabilities and Exposures (CVE) database. An exploitable vulnerability is one for which at least one functional attack or "exploit" exists. [4] Vulnerabilities are often tracked or exploited with the help of automated tools or using manual custom scripts. To secure a computer system, it is important to understand the attacks that can be made against it.

Keywords: cyber security, computer security, information technology

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SECURITY FRAMEWORK FOR IOT-BASED PUBLIC TRANSPORT SYSTEMS: A COMPREHENSIVE ANALYSIS AND DESIGN

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The Internet of Things (IoT) has transformed the way in which we interact with the world, enabling us to connect and communicate with smart devices in our homes, workplaces, and public spaces. One of the key areas of application for IoT technology is Public Transport Systems, which rely on a range of connected devices to ensure the efficient and safe movement of passengers. However, the increasing use of IoT devices in public transport systems also creates new security challenges, as these devices are vulnerable to cyber attacks that could compromise the safety and reliability of the system.In this paper, we present a comprehensive security framework for IoT-based public transport systems that address these challenges. The proposed framework includes a thorough analysis of the security measures currently in place in these systems and identifies potential vulnerabilities that need to be addressed. We also propose a set of design principles and security mechanisms that can be implemented to enhance the security of IoT-based public transport systems.

Keywords: internet of things, communication protocols, cybersecurity, security framework, public transport systems

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DEVELOPMENT OF INVENTORY MODEL FOR PERISHABLE PRODUCT WITH DYNAMIC PRICING

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Perishable products are products whose value decreases over time. Inventory management for perishable products is a challenge experienced by retailers. Problems arise when inventory costs increase due to the large amount of waste products. The aim of this research is to maximize profit by providing policy recommendations for inventory procurement under dynamic pricing. The focus of this research optimization is to determine the optimal lot size and reorder level. To solve this problem a simulation model is created by considering changes in product prices as product quality decreases. The simulation method in this study is a discrete event simulation using simulation software. Events in this inventory simulation include the arrival of customers and the addition or reduction of inventory levels. The replenishment policy in this study is continuous reviews. Simulation scenarios were generated to obtain an optimum lot size and reorder level. The best scenario is obtained from a combination of optimum lot size and reorder level. An inventory simulation model was generated based on fruit product data at one of the major retailers in Indonesia.

Keywords: perishable product, inventory model, dynamic pricing, discrete event simulation

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COMPARATIVE EXPERIMENTAL AND THEORETICAL STUDY ON THE STRUCTURE OF POTASSIUM 2,4- HEXADIENOATE: STRUCTURE-ACTIVITY RELATIONSHIP.

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For the first time, a density functional theory (DFT) study was conducted on the structure of a well-known antibacterial agent namely potassium 2,4-Hexadienoate, in order to elucidate its vibrational, electronic and reactivity proprieties. Structure optimization was performed using three common hybrid functionals (DFT/ B3LYP-D3; DFT/ M05-2X and DFT/M06-2X) to identify the suitable functional. Geometric parameters, IR and UV-vis spectra were well reproduced when using DFT/M06-2X with 6-311(d)G+ basis set (R^2 = 0.99913). The assimilation of IR frequencies has been achieved using potential energy distribution (PED) analysis at M06-2X/6-311(d) G + level. Time-dependent density functional theory (TD-DFT) and natural bond orbital (NBO) analysis were realized to identify the excited states of 2,4-Hexadienoate anion in the liquid phase, using the solute electron density solvation model (SMD). Moreover, reactive sites in the molecule were localized by molecular electrostatic potential (MEP) analysis. Highest Occupied Molecular Orbitals (HOMO), lowest Unoccupied Molecular Orbitals (LUMO) and energy gap (HOMO-LUMO gap), were used to calculate global reactivity descriptors (GRDs), according to the frontier molecular orbitals (FMO) theory, the resulting values were analyzed to explore the chemical reactivity of the molecule and elucidate the structure-activity relationship.

Keywords: sorbate, dft, homo-lumo gap, nbo, mep, antimicrobial activity

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SYNTHESIS, BIOLOGICAL EVALUATION AND THEORETICAL STUDIES OF HYDRAZONE DERIVATIVES.

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The Hydrazones possesses some particular properties which make them a potential candidate for designing new moieties. They contain a C=N bond in conjugated form with a functional nitrogen electron pair. They are distinguished from other members of this class (imines, oximes) by the presence of two interlinked nitrogen atoms . These nitrogen atoms are nucleophilic, while the carbon has both an electrophilic and nucleophilic nature and further combining hydrazones with numerous functional groups leads to the formation of products with unique biological properties. The aim of this work is to synthesize, characterize and evaluate the biological activity of a series of hydrazone derivatives. These new compounds were characterized by elemental analysis, IR spectroscopy, mass spectrometry, UV-Vis Spectroscopy, Scanning Electron Microscopy (SEM) and ^{1}HNMR spectra and thermogravimetric analysis (TGA). In vitro, Their antibacterial and antifungal activities were screened against bacterial species (Staphylococcus aureus, Bacillus subtilis and Escherichia coli) and fungi (Candida albicans). In silico, The Toxicity were studied by ADMET simulations. A structural, energetic and electronic theoretical study was carried out using the DFT method, with the functional B3LYP and the gaussian program 09. A complete optimization of geometries was made, followed by a calculation of the frequencies of the normal modes of vibration. The UV spectrum was also interpreted. The theoretical results were compared with the experimental data.

Keywords: hydrazone derivative , synthesis , theoretical study, antibacterial , activity

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MICROSTRUCTURE AND MECHANICAL PROPERTIES ANALYSIS OF AL-6061/B4C COMPOSITES FABRICATED BY CONVENTIONAL AND BOBBIN TOOL FRICTION STIR PROCESSING

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Friction stir processing (FSP) has garnered the interest of many researchers in developing surface composites. Bobbin tool friction stir processing (BTFSP) is a novel variant of conventional FSP. In the present paper, Al-Mg-Si (6061Al –T6) plates of 6 mm thickness were subjected to BTFSP and CFSP using B_4C reinforcement particles for comparison. The fabricated composites' reinforcement particle distribution and mechanical properties along the thickness direction were investigated. Agglomeration was observed in BTFSP composites. This should be attributed to the crack formation in the BTFSP due to the absence of forging action, leading to the deposition of the B_4C in the crack. CFSP composites obtained excellent dispersion of the B_4C particles. This is due to the tilt of the tool, which helped in effective forging action by the shoulder at the trailing edge. The results of micro-hardness indicated the same level for both the processed composites. Wear analysis revealed the improved wear properties for the fabricated composites as compared to the as-received Al.

Keywords: friction sitr processing, bobbin tool, composite, tilt angle, microhardness

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NUTRITION IN DISASTER SITUATIONS

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A disaster, in its most general definition, is an event that affects communities by stopping or interrupting normal life and human activities. In this case, there is a situation that the affected community cannot overcome by using its own means and resources. Disaster can be natural, technological or man-made. Disaster exposure increases the psychological and physiological vulnerability of individuals. Meeting the nutritional needs without interruption in extraordinary situations such as disasters helps to prevent further loss of life that may occur due to disasters. In addition, it also makes people feel better spiritually. In the first stage of the nutrition organization, providing people with access to foods such as a hot soup and tea will relieve them psychologically. At the same time, the distribution of foods that are easy to obtain, resistant to spoilage and high in calories should be provided at this stage. Bread and other cereal group foods, soups, cheese, yogurt, olives, biscuits, fruit juice, canned foods are the ones that come to the fore. Since the conditions for preserving food after the earthquake will be difficult, attention should be paid to easily perishable foods such as dairy products against food poisoning. The amount of food stocked for use in disasters is insufficient and very few of them can be ready to be eaten without the use of heat and clean water. Many of the traditionally stored emergency foods become unusable after their expiration date. For this reason, it would be more beneficial to establish food systems prepared specifically for disasters.

Keywords: disaster, nutrition, health.

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COMPARING SMARTPHONE COOLING METHODS: WHICH IS THE BEST FOR OPTIMUM PERFORMANCE

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Smartphone cooling methods play an essential role in ensuring the longevity and optimal performance of electronic devices. The natural byproduct of electronic devices, including smartphones, is heat, which can damage components and reduce a device's lifespan. There are various smartphone cooling methods, including heat sink, liquid cooling, fan cooling, and thermal pads that offer different levels of efficiency and effectiveness. Heat sinks are metal cooling plates that work by absorbing and dissipating heat from phone components, while liquid cooling uses a liquid coolant to transfer heat from components to a radiator, which cools the liquid and dissipates heat. Fan cooling involves blowing cool air over components to reduce their temperature in combination with heat sinks or liquid cooling. Lastly, thermal pads use high thermal conductivity materials to transfer heat away from phone components at an affordable cost. The selection of a smartphone cooling method depends on several factors such as heat generation, use, and the device's ambient temperature. Liquid cooling has the highest cooling efficiency and is ideal for high-end smartphones and gaming laptops, while heat sinks and fans are suitable for less-demanding tasks. Thermal pads are an affordable alternative to liquid cooling, although they have lower efficiency. In summary, efficient cooling methods are necessary to ensure the long-term performance of smartphones, and users must choose a cooling method suitable for their specific device to prevent damage and reduce the likelihood of expensive repairs or replacements.

Keywords: smartphone cooling, heat sinks, liquid cooling, fan cooling, thermal pads, cooling efficiency, longevity, electronic devices

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DETECTION OF WEEDS IN SOYBEAN CROPS USING UAV AND U-NET

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Recently, the use of unmanned aerial vehicles in agriculture improves productivity. For this reason, it is used in many areas such as determining diseases in plants, estimating harvest time and irrigation time, and detecting weeds. Determination of weeds with traditional methods is a very difficult and time-consuming process, especially in large lands. Thanks to unmanned aerial vehicles, valuable data can be collected from the lands in a short time. These data can be analyzed with deep learning methods and useful information can be obtained.Deep learning methods provide to analyze big data. In this study, weeds in soybean are detected by using the U-net model, which is one of the deep learning methods. Res-net24 is used to extract features. U-net and Link-net algorithms are compared to segmengantion of UAV imagery of soy beans. Experimental studies show that the U-net algorithm has promising results in the automatic detection of weeds in soybean.

Keywords: deep learining

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MECHANICAL, THERMAL AND FLAMMABILITY CHARACTERIZATION OF NANO-COMPOSITES BASED ON POLYPROPYLENE AND B-STRONTIUM HYDROGEN PHOSPHATE NANO-SHEETS

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In this study, β-strontium hydrogen phosphate (β-SrHPO4) sheets (β-SHPs) were used as 2D nano-fillers in different concentrations (5 to 30 wt.%) to functionalize the polypropylene (PP) matrix composites. The PP/β-SHPs composites were prepared by melt mixing process by using a small scale twin-screw extruder. The images of scanning electron microscopy (SEM) indicated the uniform distribution of β-SHPs in the PP with small clusters of aggregation at all concentration levels. According to the tensile test results, a maximum increment (10.85%) in tensile strength with respect to the pure PP was observed in the composite containing 5 wt.% β-SHPs. It was seen from the TGA results that the addition of β-SHPs improved the thermal stability of the composites and increased the char residue. The PP/β-SHPs composite filled with 10 wt% β-SHPs was classified as HB in the UL-94 HB test. In conclusion, the results are promising that β-SHPs can be used as a reinforcing material in nanocomposites with its beneficial properties.

Keywords: β-strontium hydrogen phosphate, polypropylene, nanocomposites, mechanical properties

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UTILIZATION OF SINOP SAND IN CERAMIC CASTING SLURRY

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Casting is a widely used method in ceramic production, and many inorganic raw materials are used in artistic and industrial ceramics to improve the physical and aesthetic features of the ceramic body. Casting slurry is a suspension consisting of mixtures in specific proportions of clays with plastic properties and other non-plastic raw materials. In this study, silica-richsandhas been taken from the Korucuk area in Sinop, Turkey, and its utilization has been investigated in the production of the bodies which can be formed by slip casting method. Firstly, Sinop Sand was ground and characterizedby using X-ray diffractometer(XRD)and X-ray fluorescence (XRF) techniques. Thermal properties of Sinop Sand were obtained by Differential Thermal Analysis (DTA) and Thermogravimetry (TG)analysis.Different ceramic slurry recipes that provide optimum casting concentration were prepared and shaped by plaster mold.Next, the green bodies were sintered at 1000ºC and 1100ºC. Following the firing process, phase, dilatometer, and microstructure analysis of ceramic bodies were performed, and mechanical properties were determined.

Keywords: casting slurry, sinop sand, mechanical properties, characterization, ceramic

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ACTIVATION CONDITION OF A FAN THAT COOLS A PV PANEL BY BLOWING AMBIENT AIR ON ITS REAR FACE

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Under particular climatic conditions, the equilibrium temperature of a PV panel can increase excessively.This can significantly affect its electrical efficiency.The use of a cooling system, minimizing the negative effect of this temperature increase, can improves the efficiency of the cooled PV panel.In this work, we are interested in the cooling by a fan which blows ambient air on the rear face of a PV panel. This fan was activated by the PV panel itself. Thus, for an efficient use of this cooling system, it was necessary to define the activation conditions of this fan. To do this, a thermal model was used to determine the equilibrium temperature of the uncooled PV panel. Then, numerical simulations were performed by CFD code to evaluate the new equilibrium temperature of the cooled PV panel. This allowed to determine, by a one-diode electrical model, the improvement of electrical efficiency. The fan will then be activated from 5% improvement. This difference is then associated to the minimum temperature difference between the uncooled PV panel and the ambient air. For different values of solar radiation and air temperature, a correlation was established with this minimum difference.

Keywords: air cooling , activation condition, cfd, fan, photovoltaic panel

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A COMPARATIVE STUDY ON MICROWAVE ASSISTED DYEING PROPERTIES OF CONVENTIONAL AND RECYCLED POLYESTER FABRICS

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In the literature, microwave studies are predominantly on cellulosic based fabrics and there are not many studies in microwave assisted polyester dyeing. Today, due to the interest in recycle polyester, it was decided to study conventional and microwave heating in the exhaust dyeing methods of recycle polyester and conventional polyester fabrics. The aim of the study was to determine whether microwave heating could be used to shorten dyeing process times and to obtain dyeing with sufficient colour fastness. Accordingly, two samples, %100 polyester and %62 recycle polyester %38 polyester woven fabrics, are used. The samples were dyed with %1,5 Bemacron Smart Red EE disperse dye. The colouristic properties, colour fastnesses and tear strength of the dyed fabrics were investigated and compared with each other. Spectrophotometer measurements were evaluated that 100% polyester fabric dyed with the microwave method had a darker color compared to the conventional method, on the other hand, there was no significant color difference between the conventional and microwave dyeing method of the %62 recycle polyester %38 polyester woven fabric. Colour fastness test results were evaluated that all the fastness results of the recycle and conventional polyester fabrics in the microwave tests were obtained 4 and 4-5. The advantages of microwave heating over the conventional method are that the dyebath heats up in a short time and gives good color fastnesses without any deterioration in the properties of dyed materials.

Keywords: polyester fabric, recycle, dyeing, microwave

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INVESTIGATION AND EXPERIMENTAL INVESTIGATION OF MAGNETORHEOLOGICAL SHOCK ABSORBER USED IN SEMI-ACTIVE SUSPENSION

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The automotive industry is rapidly moving towards autonomous vehicles. In this case, the answers of the vehicles can be change in different scenarios. At this point, the suspension system must be semi-active or fully active. Magnetorheological shock absorbers can be used in semi-active suspension systems. In this study, studies were carried out on the examination and testing of magnetorheological shock absorbers. These systems can change the stiffness of the shock absorber with the effect of magnetic field depending on the data coming from the road and the condition of the vehicle. It does this by changing the viscosity with the nano powders affected by the magnetic field. Ferromagnetic nanoparticle additives are used in the shock absorber. However, one of the biggest risks in these shock absorbers is the precipitation of nano powders in the oil. If this happens, it starts to fail to fulfill its shock absorber feature. To prevent this, oil density and nano powder density should be close. In this study, low density polystyrene coated with magnetic material and this particles was added to the oil in the shock absorber. As a result, particles with a density of 0.877 gr/cm3 were obtained and oil with a density of 0.971 gr/cm3. As a result of the observation, no significant precipitation was observed in the liquid formed. A prototype MR damper was produced using this mixture. In the next step, the effects of the electromagnetic field on the shock absorber were investigated and the shock absorber is controlled by electromagnetic field. As a result, the piston velocities of the damper in response to the force were measured under 3 different forces, without magnetic particles and at different current values after the magnetic particle was added. Damper hardening with current was observed.

Keywords: semi-active suspension system, nanocomposite, mr shock absorber

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EFFECT OF UREA USAGE RATE ON THIXOTROPIC BEHAVIOR OF CEMENTITIOUS SYSTEMS

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It was understood that studies investigating the use of alternative materials have increased in order to develop concrete technology, to expand sustainability and to improve the fresh and hardened state properties of cementitious systems. It was reported that one of these alternative materials is urea, which can increase both the flow performance of the mixture and the freeze-thaw resistance. In this study, the effect of the use of urea on the thixotropic behavior of Portland cement systems was investigated. In addition to the urea-free control mix, 4 different batches of paste mixes were prepared by replacing the cement with urea at a rate of 2.5%, 5% and 10% by weight. The thixotropic behavior of the mixtures was evaluated by comparing the hysteresis area values obtained from the viscosity-shear rate graphs. It was determined that the structural build-up area measured at the beginning and the structural breakdown area measured at the end of the 180 second rest period decreased with the use of urea. It was determined that the optimum urea utilization rate was 2.5% in terms of the thixotropic area value of the mixtures.

Keywords: urea, viscosity, hysteresiz area, loop test, thixotropy

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EFFECT OF CLAY TYPE, FINENESS AND METHYLENE BLUE VALUE ON MINI-SLUMP PERFORMANCE OF CEMENT SYSTEMS

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It is known that the fresh and hardened properties of cementitious systems are adversely affected by the increase in the clay content of the aggregates. Depending on the aggregate source, the clay type varies. It was emphasized that the clay type is effective on the behavior of cementitious systems. In this study, the effects of clay type, fineness and methylene blue value on the mini-slump performance of cement paste were investigated. For this purpose, within the scope of the study, the methylene blue value of 2 different types of clay (montmorillonite and kaolin) and sand was determined. The effect of the aforementioned clays and sand on the properties of the cement paste mixtures of the 0.125 sieve powder fraction was investigated. It was determined that montmorillonite has 5 times higher methylene blue value compared to kaolin. It was determined that the mini-slump value of the mixtures increased with the increase of the water/cement ratio, independent of the clay type, and the said values decreased with the addition of clay. In terms of mini-slump performance, the clay fineness parameter was found to be more dominant than the methylene blue value.

Keywords: montmorillonite, kaolin, water requirement, mini slump, methylene blue

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BLOCKCHAIN SECURITY- EFFICIENCY ANALYSIS BASED ON DEA-SBM MODEL

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The blockchain security market will be valued at $1.4 billion by 2023. This expansion is driven by the broad adoption of blockchain technology across industries like finance, healthcare, and logistics. As more companies use blockchain technology, there is an increased need for tried-and-true strategies to protect their data from hacking and other unwanted activity. The network's security is crucial to blockchain technology's success and general adoption. Due to the rising frequency of cyberattacks and data breaches, the importance of blockchain security is only anticipated to grow over the coming years. The most successful blockchain security companies will be discussed in this research. We utilize three inputs and two outputs as the basis of analysis. DEA-SBM analysis chose the list of potential companies, including Hacken, Quantstamp, OpenZeppelin, Trail of Bits, ConsenSys, Certik, LeastAuthority, PWC Switzerland, Slowmist, and Runtime Verification. This paper aims to assess the efficiency of the blockchain security industry for decision-makers, experts, and government to understand this sector, thereby improving the overall security and integrity of the blockchain network and promoting the adoption and implementation of blockchain technology in various industries.

Keywords: blockchain, security, dea-sbm, decision making, optimization

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EVALUATION OF THE QUALITY OF THE ULTRASONIC MEASURING TRANSDUCER

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Ultrasonic measuring transducers differ from each other in their operating temperature, which depends on the Curie point of selected piezoelectric material (gallium phosphate, lithium niobate, lead zirconate titanate, etc.). Considering the physical and chemical properties of the piezoelectric material, other parts of the ultrasonic transducer and their bonding material (glue, solder, etc.) must be selected responsibly because all of them must be acoustically compatible and have similar thermal expansion coefficients. Our developed sandwich-type ultrasonic transducer comprised piezoelectric material, electrodes, a protector, and a backing element. Lead zirconate titanate (PZT) was chosen as the piezoelectric material and limited the transducer performance to 250 °C. The tensile stress between the PZT and silver electrodes, as well as soldering as a bonding technique, was evaluated using the prompted tension test method up to failure with an extensometer. The weakest adhesion was between the silver and the piezo ceramic (7.844–8.293 MPa). The tension test indicated that adhesion strength between different parts of the ultrasonic transducer was sufficient. The performance of the developed ultrasonic transducer was tested by attaching it to a carbon steel block to measure reflected signals from the bottom of the sample during heating (up to 225 °C) and cooling (to 50 °C). Only a slight hysteresis in signal amplitude during heating and cooling was observed, which could be explained by the physical differences in the ultrasonic transducer and the carbon steel sample, which is larger and heated up more slowly than the transducer. Evaluation of the quality of this developed sandwich-type ultrasonic transducer suggested that it could be used for measurement up to 225 °C.

Keywords: adhesion, temperature, ultrasonic measurement transducer, soldering, prompted tension test

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EFFECTS OF WATERJET REFERENCING AND CALIBRATION ON CUTTING TOLERANCES OF EN 10025 S235JR STEEL AND VARIOUS SERIES OF EN AW ALUMINIUM ALLOY SHEETS

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This work investigates the effects of calibration and referencing mechanism of a waterjet cutting machine on cutting surfaces of different materials. To see the differences at best conditions, multiple cutting tests will be done via waterjet cutting machine before and after doing the machine calibration. Cutting surfaces will be investigated with a professional caliper and hollow depths created by water stream will be measured. Trend graphs will be created for different materials to see how they tend to react under water stream with different precisions. Although waterjet cutting is a well-established technology, there is a lack of comprehensive research on the effects of referencing and calibration on cutting tolerances for different materials. This thesis aims to investigate the effects of waterjet referencing and calibration on the cutting tolerances of EN 10025 S235JR steel and various series of EN AW aluminium alloy sheets. The research will focus on identifying the optimal referencing and calibration techniques that can be used to achieve the desired cutting tolerances for each material. The research questions for this thesis are: What are the effects of waterjet referencing and calibration on the cutting tolerances of EN 10025 S235JR steel and various series of EN AW aluminium alloy sheets? What are the optimal referencing and calibration techniques that can be used to achieve the desired cutting tolerances for each material?

Keywords: waterjet, abrasive, cutting, cnc, aluminum alloy, steel, sheet metal

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ON THE DEVELOPMENT OF THE FLUORESCENCE EXCITATION-EMISSION ETALON MATRIX ALGORITHM OF WINE

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Our research provides the analysis of different types of Georgian wine based on 3D fluorescence spectroscopy (3DF) using the Black Comet (200-950 nm) spectrometer manufactured by StellarNet. In this method, the 3D fluorescence signal is divided into a fixed number of statistical components. For each type of wine, a 3D database is strictly defined, which we conventionally call etalon. The etalon describe the excitation/emission spectra in details. The advantage of the 3DF method compared to other statistical methods, such as peak component analysis (PCA), lies in the uniqueness of the unfolding of the spectra. The fluorescence spectra of the wine will be further analyzed by peak component analysis (PCA). After performing the PCA analysis, in order to reduce the number of tolerant etalons, we will use the tolerant etalon sample (TES) comparison analysis, thus determining how tolerant the researched wine sample is to a particular etalon. Acknowledgement. Work was supported by the 2023 Competition for Targeted Scientific Research Projects „Research of the optical properties of the substance on the example of the creation of statistical-computer reference models of several popular types of Georgian white wine“.

Keywords: fluorescence , spectroscopy , laser

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ETF MARKETS' PREDICTION & ASSETS MANAGEMENT PLATFORM USING PROBABILISTIC AUTOREGRESSIVE RECURRENT NETWORKS

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The significance of macroeconomic policy changes on ETF markets and financial markets cannot be disregarded. This study endeavors to predict the future trend of these markets by incorporating a group of selected economic indicators sourced from various ETF markets and utilizing probabilistic autoregressive recurrent networks (DeepAR). The choice of economic indicators was made based on the advice of a domain expert and the results of correlation estimation. These indicators were then divided into two categories: "US" indicators, which depict the impact of US policies such as the federal reserve fund rate and quantitative easing on the global markets, and "regionspecific" indicators. The findings of the study indicate that the inclusion of "US" indicators enhances the prediction accuracy and that the DeepAR model outperforms the LSTM and GRU models. Furthermore, a web platform has been developed to apply the DeepAR models, which enables the user to predict the trend of an ETF ticker for the next 15 time-steps using the most recent data. The platform also possesses the capability to automatically generate fresh datasets from corresponding RESTful API sources in case the current data becomes outdated.

Keywords: macroeconomic policy, etf markets, financial markets, deepar, economic indicators, machine learning

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ANALYSIS OF TEMPERATURE CHANGE EFFECT ON DISSIPATION OF ENERGY IN FUNCTIONALLY GRADED BEAMS

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Excellent properties of the functionally graded materials make them potential substitute of the conventional engineering structural materials like metals and composites. Therefore, functionally graded materials have been widely used for manufacturing of various load-bearing structural members. In this paper, an analysis of the energy dissipation in functionally graded beam structures of viscoelastic behaviour under bending is presented with considering the effects of temperature change. There is an obvious need of carrying-out of such analyses because very often various load-bearing beam structures made of functionally graded viscoelastic materials are exposed to temperature changes simultaneously with external mechanical loading during their lifetime. Rheological model with one spring and two viscous components is used for treating the beam viscoelastic behaviour. The energy dissipation analysis accounts for the temperature change by correcting the time-dependent modulus of elasticity. A parametric study is performed. The general trend of the results obtained is that the dissipated energy decreases when the temperature increases.

Keywords: energy dissipation analysis, viscoelastic material, temperature change, functionally graded beam structure, bending

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NON-LINEAR VISCOELASTIC BEAMS UNDER PERIODIC STRAINS: AN APPROACH FOR ANALYZING OF LONGITUDINAL FRACTURE

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One of the important tasks of up-to-date material science is the development and perfecting of continuously inhomogeneous structural materials. In recent decades, the functionally graded materials have emerged as an advanced type of materials with continuous inhomogeneity. The change of microstructure of functionally graded material in a structural component can be formed in a desired way. This work describes a longitudinal fracture analysis of beam structure of circular cross-section under periodic strains. The material whose properties vary in radial direction has non-linear viscoelastic behaviour. The beam is loaded in torsion so that the twist angle represents a periodical function. Time-dependent behaviour under periodic strains is dealt with a model having a non-linear spring and a linear dashpot. The complementary strain energy in the beam is considered to determine the strain energy release rate. The balance of energy is examined to verify the strain energy release rate. The ascendency of various parameters over strain energy release rate is assessed.

Keywords: beam structure, inhomogeneous material, periodic strain, non-linear viscoelastic behaviour

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ENHANCING CONDUCTIVITY IN MOBILE PHONES THROUGH REDUCTION IN SIZE OF NON WOVEN FABRIC CONDUCTIVE TAPE USED IN GASKETS

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Gaskets are an essential component in mobile phones, providing a seal between the different parts to prevent ingress of dust, moisture, and electromagnetic interference. Non-woven fabric conductive tape is commonly used in gaskets to enhance their electrical conductivity. However, the size and thickness of this tape can affect the conductivity and overall performance of the gasket. In this study, we aimed to improve conductivity in mobile phones by reducing the size of the non-woven fabric conductive tape used in gaskets. We developed a series of gaskets with varying sizes of tape and conducted electrical conductivity tests to measure their performance. Our results showed that reducing the size of the non-woven fabric conductive tape significantly improved conductivity in the gaskets. Specifically, gaskets with smaller tape sizes demonstrated a 20% increase in electrical conductivity compared to the control group. Overall, this study highlights the importance of optimizing gasket design to enhance electrical conductivity in mobile phones. By reducing the size of the non-woven fabric conductive tape used in gaskets, we can improve the overall performance of mobile phones, ensuring better connectivity and reliability for users.

Keywords: conductivity in the gaskets, non-woven fabric conductive tape , mobile phone signal quality

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BIODIESEL PRODUCTION USING SUPERCRITICAL METHANOL IN BENCH-SCALE REACTOR

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Biodiesel is preferred as an alternative fuel due to its sustainability and easy availability of raw materials. Studies to improve the production time and costs of biodiesel are gaining importance in terms of being used in higher portions as a fuel. Traditional catalytic biodiesel production is a time and energy-consuming process due to feedstock preprocessing, product separation, and purification steps. Non-catalytic biodiesel production using supercritical alcohol may shorten and eliminates the pre- and post-production process stages in terms of time and cost compared to traditional methods. In this study, canola oil was converted to biodiesel using supercritical methanol. Biodiesel production was carried out in the bench-size supercritical reactor that was fabricated as part of this study. The higher yield was obtained from biodiesel produced using canola oil and supercritical methanol compared to the traditional catalytic methods. 98.8 % yield was obtained at 240˚C and 8.3 MPa which were just above the critical temperature and pressure of methanol. Including reaction and separation, the complete process via supercritical transesterification took 180 minutes, while the whole traditional base-catalyzed transesterification process takes approximately one day.

Keywords: biodiesel, supercritical methanol, transesterification

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A COMPARATIVE ANALYSIS OF UNCERTAINTY ASSESSMENT FOR ANNUAL YIELD PREDICTION OF CITRUS GROWTH USING FIS AND ANFIS MODELS

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Accurate prediction of citrus crop yield is essential for effective agricultural planning, resource allocation, and decision-making. This study aims to compare the uncertainty analysis of developed Fuzzy Inference System (FIS) and Adaptive Neuro-Fuzzy Inference System (ANFIS) models in the context of predicting the annual yield of citrus growth. To achieve this, a comprehensive dataset comprising relevant features such as climate variables, soil conditions, and historical yield records is collected. The FIS model is developed by defining linguistic rules based on expert knowledge and using fuzzy logic to approximate the relationships between input variables and citrus yield. On the other hand, the ANFIS model, which combines the advantages of fuzzy logic and neural networks, is constructed using fuzzy membership functions and trained using the same dataset. To evaluate the uncertainty associated with the predictions of both models, a Monte Carlo simulation technique is employed. This approach involves generating multiple random samples of input variables within their respective uncertainty ranges and propagating them through the trained models to obtain corresponding output predictions. The variability in the generated outputs provides an estimate of the prediction uncertainty. Preliminary results indicate that both the FIS and ANFIS models exhibit promising performance in predicting the annual yield of citrus growth. However, a detailed comparison of uncertainty metrics suggests that the ANFIS model tends to provide more precise and reliable predictions, with narrower confidence intervals, compared to the FIS model. This could be attributed to the adaptive learning capabilities of ANFIS, allowing it to effectively capture complex nonlinear relationships between input variables and citrus yield.

Keywords: uncertainty analysis, fis, anfis, citrus fruits yield

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SINGLE OBJECTIVE OPTIMIZATION OF CUTTING PARAMETERS FOR SURFACE ROUGHNESS IN TURNING OF INCONEL 718 USING TAGUCHI APPROACH

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The majority of work in machining processes is focused on choosing the parameters that will result in the greatest rate of material removal and the least amount of surface roughness, cutting temperatures, cutting pressures, vibrations, etc., which are the main quality responses. Surface roughness is one of the most precise quality criteria that affects how machined parts work. By choosing the appropriate cutting settings, it should be possible to get a greater surface finish and a longer service life for the machined parts. The link between changes in surface roughness caused by turning operations with respect to different machining settings is investigated in this study using the Taguchi method L9(3^3). The orthogonal array, signal-to-noise ratio, and analysis of variance are utilized to examine the performance characteristics when turning Inconel 718 bars with CCMT09T308N-SU coated cemented carbide insert tools. The optimal setting of cutting parameters to lessen surface roughness is chosen using the Taguchi method. Speed, feed rate, and cut depth are the three cutting parameters. Experimental results are given to illustrate the effectiveness of this strategy.

Keywords: taguchi, turning, anova, inconel 718, s/n ratio

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APPLICABILITY OF A GAGE R&R STUDY ON A HOME BLOOD GLUCOSE METER

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Home glucose meters have become widely accessible and, in addition to self-monitoring applications, are now commonly used to support biohacking. Accu-Chek Instant is an easy-to-use and cheaply available device, and thus, it is recommended to use in a known lifestyle change program. Participants and users do not require special knowledge, though have due or undue concerns about changes in blood glucose levels. The study aims to find the minimal magnitude of change in blood glucose level, i.e. the effective resolution of the fore-mentioned device. In addition, we are seeking applicability of the standard Gage R&R study method which is well known in the automotive industry. As Gage R&R requires to incorporate several variance factors into the study, we reproduced typical home applications and daily routines of laymen. Our results on measurement uncertainty turned to be in range with the accuracy specified by the manufacturer, and the Gage R&R method helped us to formulate answer to home user concerns on a layman's language.

Keywords: gage r&r, measurement uncertainty, blood glucose meter, biohacking, accu-chek instant

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ENHANCING CYBERSECURITY WITH TRUST-BASED MACHINE LEARNING: A DEFENSE AGAINST DDOS AND PACKET SUPPRESSION ATTACKS

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As technology becomes more intertwined with our daily lives, it is increasingly important to protect our data from attackers. Cyber security has become a top priority for individuals, businesses, and governments, as the threat of cybercrime is constantly evolving and becoming more sophisticated. With the rapid increase in cyberattacks, it has become tricky and cumbersome for cybersecurity experts to react to them all, predict new attacks and analyze the impact of damage being done to business. Traditional security measures such as firewalls, anti-virus software, and intrusion detections are no longer adequate in protecting against new vulnerabilities, especially insider and misbehavior attacks. Recently, Artificial Intelligence based techniques have brought tremendous improvements in cybersecurity with the integration of machine learning (ML) algorithms. ML methods have been built upon large volumes of real-time network data to deploy automated security and threat detection systems. Nonetheless, various cyber-attacks still circumvent traditional security mechanisms deployed to detect those attacks. To address the challenge, in this paper, we propose a machine learning-enabled trust-based routing protocol (TrustML-RP) that identifies the attacking nodes responsible for Distributed Denial of Service (DDoS) and packet suppression attacks. The proposed TrustML-RP scheme first adopts a distributed trust model for establishing trust factor among the participating nodes and later employs an effective combination of ML algorithms e.g., Artificial Neural Network (ANN) and Support Vector Machine (SVM) to find optimal and secure route and identify attacker nodes. A comprehensive performance evaluation of the proposed scheme is carried out to demonstrate the efficiency on a reasonably sized network containing mixed nodes. The results demonstrate the effectiveness of proposed scheme in building trusted network environment and improving network security. The research findings suggest that integration of trust-based model and ML techniques can improve traditional cybersecurity methods thereby enabling cybersecurity professionals to design more effective cybersecurity systems.

Keywords: cyber security, machine learning, cyber-attacks, ddos, packet suppression attack, trust-based routing

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THE OPTIMUM ANGLE OF FIXED LOUVER SLAT FOR MAXIMUM LIGHTING ENERGY SAVING IN OFFICE BUILDINGS

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In this paper, the lighting energy saving by louvers in office buildings is discussed. Currently, heating, ventilation, air conditioning, air purification, and lighting collectively account for 37% of the total energy consumption in buildings[1]. Of this, 35% of the energy used in buildings is consumed by artificial lighting alone, even during office hours when natural light is available. To reduce the energy consumption associated with artificial lighting, there has been growing interest and application of daylighting louvers in buildings, particularly in South Korea, where the demand for such louvers has significantly increased. Daylighting louvers provide an effective way to allow more natural light into buildings during office hours, thereby reducing the need for artificial lighting and saving a significant amount of energy. This paper focuses on determining the optimal slat angle of fixed louvers, which can significantly reduce installation costs, to maximize energy savings from such louvers. In this study, a KILT(Korea Institute of Lighting Technology)'s standardized room for louver testing was used for simulation. As a result of simulation, the optimum angle of fixed louver slat was found to be –20° for maximum LED lighting energy saving of 78.5%.

Keywords: renewable energy, lighting energy, louver, slat

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DEEP LEARNING MODELS (RNN, LSTM , CNN-LSTM, BI-LSTM) TO ARABIC TEXT CLASSIFICATION

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With the increase in the number of Internet users, the amount of data has increased dramatically. Millions of texts are written daily in most fields, whether cultural, scientific, political, health, or others, through websites, social media, and academic or news institutions. This data has become an essential source for providing additional services. One of these services is the classification of texts into previously defined categories according to the information they contain.Texts in the Arabic language are still considered a great challenge to carry out the task of classifying them, unlike other languages, such as English, French and many other languages.rnIn our research paper, four models of deep learning techniques were built to classify texts in the Arabic language, and the models were tested on a data set consisting of news articles and classified based on the content of the article.rnrnrn Texts in the Arabic language are still considered a great challenge to carry out the task of classifying them, unlike other languages, such as English, French and many other languages.rnIn our research paper, four models of deep learning techniques were built to classify texts in the Arabic language, and the models were tested on a data set consisting of news articles and classified based on the content of the article.

Keywords: keywords—arabic classification, deep learning , lstm, arabic text

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COMBATING OBESITY AND OVERWEIGHT WITH A "DIGITAL TWIN OF PATIENT" BASED SYSTEM-OF-SYSTEM

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While technological innovations make life easier in many ways, they also lead to a more sedentary working environment and lifestyle. A sedentary lifestyle and unbalanced food intake are the main sources of obesity and overweight problems. According to the World Health Organization; Overweight and obesity are defined as abnormal or excessive fat accumulation that can impair health [1]. Such nutritional diseases are a major public health problem and continue to endanger the health of our people and the sustainability of our health systems. Also, unbalanced food intake can cause metabolic disorders, malnutrition, overweight, poor mental performance and other medical risk factors such as hypertension and osteoporosis. This can lead to many diseases such as cardiovascular diseases, diabetes, obesity and even Alzheimer's disease and cancer. In this study, we outline a system-of-system architecture constructed around the "Digital Twin of Patient" developed by ARD Group within the scope of the Eureka Project named FoodFriend. We provide extensive information about components that are integrated within the micro-service architecture. It was also revealed that the solution could be implemented partially using existing Open Source components.

Keywords: digital twin of patient, obesity, overweight, system-of-system, microservice

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TECHNOLOGICAL TREND ANALYSIS FOR SURGICAL OPERATION DURATION ESTIMATION

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Surgical procedures are complex in nature and operative time is subject to variability influenced by many factors. Accurate estimation of the surgical operation duration not only helps to maximize Operation Rooms efficiency, but also helps to optimize hospital resources which is a crucial factor in planning surgical procedures. In this regard, AI techniques such as Machine Learning and Deep Learning promiss to significantly improve the duration estimation by identifying hidden factors and make more accurate prediction. They achieve this success by identifying latent factors which are generally hard to be explored by human intelligence. Eventually, accuracy in time estimation added to a good scheduling optimization leads to make more efficient utilization of hospital resources by better aligning Operation Room, relevant equipment, and human resources. This study addresses the recent trends in research on surgical operations duration estimation, considering the complexity of planning, scheduling, and all other aspects in pre-operation, inter-operation, and post-operation. Furthermore, we elaborate the analysis of the features that are rarely used but found most promising with some augmentation.

Keywords: surgical procedure duration, time estimation, operating room scheduling, operation room optimization, scheduling

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THE EFFECTIVENESS OF THE IMPLEMENTATION OF SPEECH COMMAND RECOGNITION ALGORITHMS IN EMBEDDED SYSTEMS

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Speech is the basis of human-computer interfaces, smart house, IoT and control systems. Implementing a real time voice control system through speech commands recognition in different environments requires simple algorithms and special purpose systems. The article analyzes the existing speech commands recognition algorithms in embedded systems. Various methods have been considered to achieve efficiency in speech signal recognition. Based on their analysis, a method with good results was developed. In this work, speech signal features and recognition algorithms were used using different methods. MFCC coefficients were used in speech signal recognition. In addition, the pre-processing of the speech signals was used in the hanning window stage, which gave good results in the analysis. Speech signal recognition was performed using extracted speech signal features and recognition algorithms HMM, VQ, DTW. The results were analyzed. The signal parameters obtained by the STFT + SVD algorithms proposed by us showed 98% accuracy when recognized by the HMM algorithm.

Keywords: hmm, speech command, dct, mfcc, stft, speech recognition, vq, dtw

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INVESTIGATING THE EFFECT OF INFORMATION SYSTEMS AND DECISION QUALITY ON ORGANIZATIONAL PERFORMANCE IN BUSINESS FIRMS

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The development of information systems raised the quality of decision-making, significantly impacting businesses' organizational performance. To evaluate this impact, the current research aimed to investigate the relationship between information systems (IS) success factors, decision-making quality (DMQ), and organizational performance (OP). A quantitative research approach was adopted, and a questionnaire was sent to 163 decision-makers who use information systems in business firms. The research model was tested using the partial least squares-structural equation modeling method. The study's empirical results indicated that information quality (IQ) had a significant positive impact on decision-making quality (DMQ). However, system quality (SQ) had an insignificant impact on decision-making quality (DMQ). Furthermore, information quality (IQ) was found to mediate the relationship between system quality (SQ) and organizational performance (OP). Finally, the decision-making quality (DMQ) was found to moderate the relationship between information quality (IQ), system quality (SQ), and organizational performance (OP). This study has important implications and recommendations for practitioners, firm managers, and decision-makers regarding evaluating information systems' impact on improving organizational performance.

Keywords: : information system, system quality, information quality, decision-making quality, organizational performance.

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ANALYSIS OF THE SUSTAINABILITY OF CLOUD SYSTEMS IN MANUFACTURING

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The work aims to highlight the strict rules of production, in a framework necessary to carry out the assessment and examination of aspects within intelligent manufacturing systems. The role of cloud systems is to revolutionize industrial production processes to ensure sustainability by combining state-of-the-art technologies. For the elaboration of this paper, I started with the idea of approaching cloud manufacturing as a production paradigm and integrated technology. So we started with traditional industry which we transformed into innovative manufacturing to be able to propose a platform architecture based on cloud manufacturing. We built a model for the cloud manufacturing platform. This platform is intended to be an example application that highlights the architecture and functions of the system. Cloud manufacturing, in this case, covers the approach of cloud computing and Internet of Things (IoT) technologies. An empirically flexible and industry-adaptable infrastructure is empirically established and approaches IOT as a complementary technology. For the empirical case study addressed, Petri nets are used for modeling and simulation because they work in real-time, are relatively easily adaptable to requirements, and provide a tracking and control system at critical points. Sustainable development with the help of manufacturing cloud systems, according to the specialized literature, is incorporated by respecting the sustainability concepts of the industry in general. Some benefits and impacts of implementing sustainability in the industry are presented. The paper provides decision-makers with techniques and a vision for the adoption of sustainable concepts at an industrial level.

Keywords: manufacturing, cloud, iot , sustainability

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DETERMINATION OF THE SHEAR FORCE IN RC INTERIOR BEAM-COLUMN CONNECTIONS

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The calculation of frame structures requires special attention when modeling the beam-column connection. Often the joint is assumed to be rigid, but this does not correspond to the real behavior of the beam-column connection, as well as the real response of frame structures. The leading countries in seismic research (USA, New Zealand, Japan) have uniform procedures introduced in their seismic codes for studying the moment resisting frame. However, regarding the determination of the shear force in the beam-column connection, there is still a discrepancy in how it is determined.rnIn the present work, a mathematical model is proposed for the analytical determination of the shear force. The emerging large deformations in the beam, which could be realized during earthquake, have been taken into account. The material is elastic. Results obtained by the finite element method in software products show good shear force magnitude matching. The obtained values are compared with results determined by mathematical procedures proposed in other literature sources.

Keywords: beam-column connection, shear force, reinforced concrete, elastic material, large deformations

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INTEGRATION BETWEEN LEAN AND RISK MITIGATION IN MEASUREMENT OF SUSTAINABILITY PERFORMANCE IN LUBRICANT MANUFACTURING

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Green company is required for companies related to business continuity.It isimportant to evaluate sustainability performance in a manufacturing process and propose strategies for sustainable growth. This research measuresthe manufacturing sustainability performance using sustainable value stream mapping by considering risk in the lubricating oil industry. The selected indicators are mapped using SVSM and a waste analysis is carried out as well as measuring the efficiency of each indicator. Furthermore, sustainable risks in the economic, social, and environmental aspects of each process are identified using the house of risk, and suggestions for improvements are given to address the waste. The indicators in SVSM and risk are then weighed to determine the level of importance of each indicatorusing the Analytical Network Process. The research was continued using Benefit Cost Opportunity Risk Analysis for each proposed improvement based on SVSM indicators and risk. This research makes a significant contribution to science because it has never been conductedbefore. Thisstudy provides a new reference formanagers in assessing sustainability performance by considering the risk factor and analyzed in various aspects. This research also helps to identify waste and risk and shows how sustainable the company. In addition, the proposed improvements will be efficient and feasible to be implemented.

Keywords: sustainable value stream mapping, house of risk, benefit cost opportunity risk analysis, analytical network process, manufacturing sustainability performance

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LSTM-BASED COVID-19 DETECTION USING CLINICAL REPORTS

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COVID-19 has affected the entire globe with its rapid spreading, causing a high transmission rate. A huge amount of people come in contact with this deadly virus, and early diagnosis of such kind of viruses may save many lives. This paper proposes an improved approach for detecting COVID-19 based on Long Short Term Memory (LSTM) and taking advantage of early clinical reports. The data to train such LSTM is collected from the metadata of the available dataset published by the World Health Organisation. Only the clinical reports and Labels are filtered out from the dataset. Various preprocessing techniques and word Embedding are used for training an LSTM-based classifier that detects COVID-19 positive cases. The results were much better after implementing the proposed approach than traditional machine learning algorithms. Testing accuracy of 87% is achieved by this model, and in future, we may work on a larger dataset to improve the efficiency of the model.

Keywords: deep learning, lstm, covid-19diagnosis, clinical report, nlp, word embedding

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EVALUATION OF 6 FEBRUARY 2023 EARTHQUAKE IN TURKEY IN TERMS OF DISASTER MANAGEMENT

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According to the Kandilli Observatory and Earthquake Research Institute data on February 6, 2023, an earthquake of 7.7 magnitude occurred at 04:17 local time in 1 Sofalaca-Şehitkamil-Gaziantep. On the same date, at 13.24, there was another earthquake with a magnitude of 7.6 centered in Ekinözü-Kahramanmaraş. Earthquakes are shallow focused at a depth of about 5 km; It has affected and felt a wide area covering Southeastern Anatolia, Eastern Anatolia, Central Anatolia and Mediterranean Regions. According to the Turkey Earthquake Hazard Map 3 published in the official newspaper on March 18, 2018, two of the biggest earthquakes in our country have occurred in the region covering the provinces of Kahramanmaraş, Malatya, Adıyaman and Hatay, most of which are defined as high danger, and their results have revealed quite devastating effects. According to the data of the Turkish Statistical Institute 6; In the provinces of Adana, Adıyaman, Diyarbakır, Elazığ, Gaziantep, Hatay, Kahramanmaraş, Kilis, Malatya, Osmaniye and Şanlıurfa where earthquakes were effective, 51,14% of the 3,478,575 buildings in which the citizens resided, in 2001 and after, 27.56% of which were built between 1981-2000, 9.96% were built in 1980 and before. The date of construction of 11.33% of the buildings is unknown. The main feature that distinguishes the February 6 earthquakes from the previous ones is that they are more destructive and have a very wide impact area. Risk management is at the forefront of what needs to be done to avoid and/or prevent a disaster. In this context; For seismicity, ground surveys and ground reinforcement studies, appropriate foundation type selection, design and construction, seismicity-friendly building design and construction, appropriate construction material selection, regional and urban planning that minimizes earthquake risk, land use regulation and landscape planning, planting and similar activities should be carried out and concluded before an earthquake occurs.

Keywords: earthquake, disaster management, danger, build

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THE USE OF SEASHELL CALCINED AT DIFFERENT TEMPERATURES FOR ARTISTIC CONTRIBITION IN CERAMIC GLAZES

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In this study, the effect of seashell utilization as a replacement for calcite on the surface features and optical properties of artistic ceramic glazes were investigated. The seashells obtained from Black Sea beaches of Samsun,Turkey, then calcinated at three different temperatures. The calcinated seahells were characterized using XRF, XRD, TG-DTA techniques, and heating microscope.The seashells were used as calcite replacement by 20 wt.% in glaze compositions. Seashell powders were incorporated to glaze compositions which are applied on the surface of different fired clay bodies such as red clay and porcelain bodies by dipping technique. Next, the glazed ceramic bodies were sintered at 1100ºC for 8 h.Finally, coloring parameters and microstructural features of seashell added glazes were determined.The variations in optical parameters were mainly associated with the difference in body compositions. Therefore, the utilization of as seashells by 20 wt.% as calcite replacement allows eco-friendly and cost-effective production of artistic ceramic glazes.rn

Keywords: seashell, ceramic, calcination, calcite, artistic ceramic glaze

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IMPROVE THE RELIABILITY AND RESILIENCE OF SOCIO-TECHNICAL SYSTEMS BY USING FEEDBACK.

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This paper focuses on the use of experience feedback (EF) to enhance the reliability and resilience of socio-technical systems. Socio-technical systems are complex systems that incorporate both technical and human elements. Incidents or accidents that occur in these systems are often the result of human error or technical malfunctions. As such, EF provides a means to learn from past experiences and to prevent or manage future incidents. This communication outlines various methods for collecting, analyzing, and utilizing EF in socio-technical systems, as well as the benefits associated with its use. Concrete examples are provided to demonstrate the positive impact of EF on the reliability and resilience of these systems. Key topics covered include incident management, risk assessment, system monitoring, and organizational learning. The presentation concludes with a discussion on the challenges of implementing EF in socio-technical systems, including issues related to data quality and information sharing. By leveraging the power of EF, organizations can enhance their ability to manage incidents, minimize risk, and promote continuous improvement in socio-technical systems.

Keywords: reliability, resilience, socio-technical systems, experience feedback, incident management.

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EVALUATION OF THE SPREAD OF RESPIRATORY DISEASES IN THE CITY OF BATNA COVER A PERIOD OF FIVE YERARS (2018-2023).

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Knowing the growth in the number of people with respiratory illness from year to year, it was deemed useful to deal with this subject by making an evaluative approach to the degree of impact by trying to seek the probable causes of this scourge and to,propose solutions inducing the minimisation of such risks on the exposed organisms.To carry out our study, an epidemiological survey was carried out to estimate the number of people suffering from multifaceted respiratory diseases within hospital structures , in parallel with an estimate of the rate of atmospheric pollution (industrial and traffic road) is calculated within the collaboration of the environmental service of the city of Batna. The evaluative approach of the risks generated by such environmental impact within the city of Batna has informed us about the obsolescence of the car fleet and this is reflected in the significant flow of pollutants emitted into the atmosphere and therefore the direct impacts on the health of the population by the inhalation of multiform pollutants add to that the fumes emitted by companies bordering the city.

Keywords: respiratory diseases; pollution; hospital road traffic; industries; pollutants; risk

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IMPACT OF DEEPFAKE TECHNOLOGY ON SOCIAL MEDIA: DETECTION, MISINFORMATION, AND SOCIETAL IMPLICATIONS

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Deepfake technology, which allows the manipulation and fabrication of audio, video, and images, has gained significant attention due to its potential to deceive and manipulate. As deepfakes proliferate on social media platforms, understanding their impact becomes crucial. This research investigates the detection, misinformation, and societal implications of deepfake technology on social media. Through a comprehensive literature review, the study examines the development and capabilities of deepfakes, existing detection techniques, and challenges in identifying them. The role of deepfakes in spreading misinformation and disinformation is explored, highlighting their potential consequences on public trust and social cohesion. The societal implications and ethical considerations surrounding deepfakes are examined, along with legal and policy responses. Mitigation strategies, including technological advancements and platform policies, are discussed. By shedding light on these critical aspects, this research aims to contribute to a better understanding of the impact of deepfake technology on social media and to inform future efforts in detection, prevention, and policy development.

Keywords: deepfake, social media, artificial intelligence, generative adversarial networks, deep neural networks.

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ESTIMATION OF RED MEAT PRODUCTION IN TURKEY ACCORDING TO THE GREY-MARKOV CHAIN MODEL

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Today, due to the place and importance of red meat in terms of nutrition and public health, meeting the reliable supply of red meat to meet the demand has become one of the most important issues. The production source of red meat in Turkey is cattle, sheep, goat and buffalo. Although Turkey is a rich country in terms of different species and breeds and animal potential, the yield per unit animal is low. Most of the meat is consumed fresh in Turkey.With the increasing importance of meeting the reliable red meat supply, the necessity of following the sector has emerged. Accurate estimation of red meat production in Turkey is important for establishing short, medium and long-term policies that will balance supply and demand. In this study, Grey-Markov chain model, which is a combination of Markov chains method and Grey estimation model, which can be used to predict future data with very limited data and information, was used in the estimation of red meat production. The obtained results show that the Grey-Markov chain model used has high predictive precision and applicability.

Keywords: grey estimation model, markov chain, meat production

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ESTIMATION OF POULTRY MEAT PRODUCTION IN TURKEY USING GM (1, 1) WITH SECOND PARAMETER FITTING-MARKOV MODEL

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Considering that poultry meat is an economical and stable food source and its place in a balanced diet, it is an indispensable food item for today as well as tomorrow. It is the most produced poultry meat in the world among other meat types since 2015. Turkey ranks 10th in the world in chicken meat production. Chicken farming and backyard poultry farming, which was mostly family-run until the 1980s, has left its place to giant facilities today. There are over 15,000 broiler breeding farms in Turkey and the annual turnover of the sector, which provides a livelihood for approximately 3 million people with all its stakeholders, has reached 5.5 billion USD. It is currently the biggest alternative to red meat. Today, white meat is preferred all over the world in terms of protein source and the per capita consumption of poultry meat is increasing every year in the world. Our per capita consumption of poultry meat has reached 21 kg/year. Accurate estimation of poultry meat production in Turkey is important for establishing short, medium and long-term policies that will balance supply and demand. In this study, GM (1, 1) with second parameter fitting-Markov model, which is a combination of the Markov chain method and the GM (1, 1) model with the second parameter fitting, which can be used to predict future data with very limited data and information, was used in the estimation of poultry meat production. The obtained results show that GM (1, 1) with second parameter fitting-Markov model used has high predictive precision and applicability.

Keywords: grey estimation model, markov chain, poultry meat production

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THE IMPACT OF DIGITALISATION AND PANDEMIC ON THE MARKETING COMMUNICATION ACTIVITIES OF HUNGARIAN SMES AND MICRO-ENTERPRISES

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In the century we live in, digitalization continues at a dizzying pace in every field.. Digitalization has led to a general change in many areas. It affects our buying habits, our communication style, many aspects of our lives. Digitalisation not only has an impact on individuals and consumers, but also has an influence at the level of companies. The focus of our research is to analyse the marketing communication and promotion activities of SMEs and micro-enterprises, specifically to assess the digital impact. Separate studies on the impact of the pandemic on the communication activities of enterprises and, in particular, on the use of digital solutions in communication. The primary data presented in this study are the results of a pre-tested, standardised questionnaire online survey. The sampling was arbitrary, so the results are valid for the sample. It is expected that the research findings will contribute to many areas, especially marketing communication.

Keywords: marketing communications, corporate sector, digitisation

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ONLINE FOOD SHOPPING HABITS AMONG HUNGARIAN YOUTH

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The focus of the research is to analyse the online food consumption preferences of Hungarian youth. Online shopping is becoming increasingly popular, driven by convenience reasons and a number of other consumer trends. The spread of digitalisation has made online shopping a simpler, faster and more cost-effective option than traditional in-store shopping. Online platforms make it easier to compare products based on price, ingredients and consumer reviews. Online shopping is not only a new sales platform, but also a new communication channel that directly influences consumer decision making through consumer generated marketing (CGM). The impact of cgm is particularly relevant for the new generation born into the world of digitalisation, who are the focus segment of our primary research. In this study, we investigated the online shopping habits of Generation Z, particularly in relation to domestic food products. We analysed the results using a pre-tested, standardised questionnaire online survey on a recruited sample using arbitrary sampling.

Keywords: online shopping, domestic food, digitalisation

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DISASTER OF THE CENTURY: 06 FEBRUARY 2023 TURKEY EARTHQUAKE

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On February 6, Turkey awoke to what has been termed the "disaster of the century". At 04:17 in the morning, there was a 7.8 magnitude earthquake, the epicenter of which was on the Gaziantep-Kahramanmaraş border. As a result, a great destruction took place in 10 provinces, namely Kahramanmaraş, Gaziantep, Hatay, Adıyaman, Diyarbakır, Şanlıurfa, Malatya, Adana, Osmaniye and Kilis. Unfortunately, the destruction was not limited to this, and after the first earthquake, in Antep, Maraş and Malatya, one of them was 7.5, the other 6.7, and the other two were 6.0; There were four more major earthquakes triggered by the first earthquake. However, despite the nature of the earthquake chain in the region, the main factor that increased the extent of destruction and disaster was the fact that the building stock in the region did not meet the necessary conditions, in other words, the element of human and negligence. Therefore, it is negligence in addition to the exceptional nature of the earthquake that made the disaster in the region the “disaster of the century”. Turkey is experiencing one of the biggest earthquake disasters that has occurred in the world in recent history, due to the two major earthquakes it has experienced within 24 hours, the type of earthquakes experienced, and the two earthquakes of this magnitude, intensity and type being experienced in a highly populated region. However, it should not be forgotten that the main factor that makes the earthquake “the disaster of the century” is the human factor and its negligence, which caused the destruction despite all the exceptionality of the disaster. After failing to prevent the collapse of structures in such a large-scale, large and severe earthquake, even if all the search and rescue teams of the world intervene and all the resources of the country are mobilized.

Keywords: disaster of the century, earthquake, türkiye

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DIRECT LABOUR MARKET EFFECTS OF ARTIFICIAL INTELLIGENCE ASSISTED APPLICATIONS BASED ON THE OPINIONS OF ILLUSTRATORS AND COMPANY MANAGERS - HUNGARIAN CASE STUDY

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In the creative industry, the last six months have seen a remarkable and rapid change with the widespread availability of certain AI-based applications for the average user, such as the various Stable Diffusion image generators, the ControlNet that goes with them, and ChatGPT. In particular, the world of illustration, corporate design/design planning, translation, film production, copywriting, virtual education are all undergoing significant and irreversible change. In this article, we summarise what can be known about the impact of AI-assisted digital applications on the labour market for the illustration professionals. Based on exploratory research used in-depth interviews, opinions are markedly divided. Some see AI-assisted applications as a new opportunity, a rapid development of a hybrid toolkit to gain a competitive advantage. Others argue that they represent a threat to daily livelihoods and devalue hand-maded creative work. According to business leaders, they can deliver significant cost savings without compromising on the level of quality expected, and on the contrary, they can enhance the user experience.

Keywords: artificial intelligence, ai painting, digital illustration, labour market, midjourney, aintrepreneur, competitiveness

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DFT STUDY OF A SCHIFF BASE LIGAND AND ITS NICKEL AND COPPER COMPLEXES: STRUCTURE, VIBRATION, CHEMICAL REACTIVITY AND IN SILICO BIOLOGICAL ANALYSIS

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Schiff base complexes are extensively studied because of their affinity, selectivity, and sensitivity to a wide variety of metals. They have been found to be very useful in catalysis, medicine as antibiotics, anti-inflammatory agents and also in industry as compounds with anti-corrosive properties. In this work, we will focus on the study of some Schiff base ligands and their complexes based on nickel and copper. An energetic, structural, and spectral study was carried out using the density functional theory method. All the calculations have been made with density functional theory (DFT) using Becke's three parameters hybrid method and the Lee-Yang-Parr correlation functional (B3LYP) with LANL2DZ basis set for heavy metals and 6-31G** for all others atoms in gas phase using Gaussian 03 program package. The stability of the considered complexes has been studied in the basis of the binding energies. A study of reactivity indices will be highlighted in order to predict attack sites. The in-silico biological properties of compounds studied have been calculated and discussed. The theoretical results will be compared with the available experimental ones.

Keywords: dft, schiff base, complexes, reactivity, admet

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ARTIFICIAL INTELLIGENCE AND BIG DATA FOR THE ANALYSIS OF IMAGES CAPTURED BY DIGITAL DERMOSCOPY

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The incidence of skin cancer and other skin lessions is increasing at an alarming rate. This has a direct impact on Primary Care centers, where it is necessary to decide which lesions require a referral to dermatology. This project aims to develop a tool that helps PC centers in this decisions making. For this amobile application will be developed that allows the capture of dermatological images and their analysis using AI techniques. AI techniques are obtaining spectacular results, especially when applied to image analysis. These system are capable of giving health professionals extra support in decission making, improving secondary prevention. Currently, mobile devices incorporate high-definition cameras and great processing capacity. This makes them usuful tools for capturing and analyzing medical images. Develop a mobile application that help the primary care physician in making decisions about whether or not to refer a patient to the specialist office. To this end, an attempt will be made to identify those potentially malignant lessions that, due to their characteristics, do not require urgent referral to a specialist.

Keywords: artificial intelligent

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AN APP FOR THE REGISTRATION OF TRAFFIC INJURIES

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The assessment of bodily harm or the determination of the degree of disability is a field of action of legal medicine and insurance with obvious economic implications. Those people who have suffered an accident or bodily harm demand a quantification of it. The assessment of bodily harm and/or disability by the expert medical professional is not exempt from complexity. Sometimes it is difficult to quantify pain; other times the doctor faces simulators or exaggerators and on many occasions it is difficult to remember the extensive assessment tables whose details are complex to remember and apply. The objective of this preparatory action is to develop a mobile application that facilitates the calculation of bodily damage and the percentage of disability of those citizens who present a functional deficiency [3,4]. The application will guide the health personnel through a series of screens where the relevant information for each case will be requested. Once it has been verified that all the information is available, the application will automatically calculate the coefficients of bodily harm and/or disability. In this way, a user with no previous experience in this field will be able to use the application immediately. Our tool aims to solve these difficulties faced by forensic medical professionals, insurance company medical services, disability rating and assessment centres, private assessment centres, occupational or traffic accident mutuals, rehabilitation services, trauma services , etc

Keywords: traffic injuries

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PROJECT MANAGEMENT ASPECTS IN SMES

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Effective and efficient project management has always been one of the key issues for corporations regardless of industry and size. Numerous authors have defined several methodologies, best practices, tools and techniques, or frameworks. However, a common limitation in these publications is the authors usually conclude their findings based on and for large companies, the SME context is rarely analysed. Despite the fact that smaller companies also initiate or participate in a huge number of projects. Participating in tenders or being subcontractors are common among SME consultancies or smaller engineering companies. Moreover, these firms have different processes, practices, and the amount of resources to manage their projects is also limited, thus, a different toolkit is needed. Based on these, the aim of this paper is to identify the major differences in SME companies who are subcontractors, and also identify the key features for successful project management. The findins were conducted by semi-structured interviews with project managers in SMEs and large companies.

Keywords: project management, sme projects, sme project management

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STRUCTURAL AND OPTICAL CHARACTERIZATION OF TL2IN2S3SE THIN FILMS DEPOSITED BY THERMAL EVAPORATION

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Layered semiconductor materials have become a serious research topic in recent years thanks to their effective optical properties. In this article, the thin film structure of $Tl_2In_2S_3Se$ material with layered structure was grown by thermal evaporation method. The structural, morphological, and optical properties of the deposited thin films were examined. X-ray diffraction (XRD), energy dispersive spectroscopy (EDS) and atomic force microscopy (AFM) techniques were used to get information about structural and morphological properties of the thin films. XRD pattern presented well-defined peaks associated with monoclinic crystalline structure. The crystallite size, dislocation density and lattice strain of the films were also obtained from the analyses of XRD pattern. EDS analysis showed that atomic compositional ratios of the Tl, In, S and Se elements are consistent with chemical formula of $Tl_2In_2S_3Se$. The optical characterization of thin film was performed using transmission and Raman spectroscopy techniques. Raman spectrum offered information about the vibrational modes of the thin film. The analyses of the transmission spectrum presented the indirect and direct band gap energies of the $Tl_2In_2S_3Se$ thin film as 2.23 and 2.52 eV, respectively. The further analyses on the absorption coefficient resulted in Urbach energy of 0.58 eV.

Keywords: thin films, 2d-materials, optical properties, tlins2, tlinse2

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