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Abstract of Accepted Papers

APPLICATIONS OF LASERS IN SCIENCE AND TECHNOLOGY

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Abstract: Lasers are becoming increasingly important in surface science, technology, physics, chemistry, electronic engineering, materials and biology. Lasers have a large influence on our lives because of their uses in coating, medical, production, the nuclear sector, energy, defence, telecommunication, navigation, pollution monitoring, art preservation, fashion, beauty, and recreation. The photo thermal, photo physical and photo chemical processes are mainly involved in ablation mechanisms. Following these ablation processes is laser-induced plasma generation, which is driven by inverse bremsstrahlung and multiphoton ionisation. Laser assisted ablation and plasma formation lead to thin film deposition, direct processing of surfaces, nano/micro structuring, annealing, cutting, welding and drilling of materials in the industry as well as for the diagnostic evaluation. The physics behind such applications is quite complex and is described by localized energy deposition leading to heating, melting and vaporization and plasma formation along with nonlinear absorption and parametric instabilities. Laser wake field accelerators, nonlinear spectroscopy and optics, optical cooling and trapping, and optical tweezers are examples of recent advances in the field of ultrashort pulse interactions with materials.

Keywords: Laser; Plasma; Ablation; Drilling

THEORETICAL STUDY OF A THIN FILM OPTICS

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Abstract: There are number of experimental methods to fabricate a **THIN FILM** on a substrate for the application in different optical devices. Before fabrication, it is better to study theoretical nature of the thin film and to formulate a theoretical model that predicts transmission, reflection and absorption from the thin film successfully. This model will

decide either that thin film may be used for that specific purpose or not, to avoid the loss of time and resources. So, we need to explore the theoretical techniques that help us to study the optical behavior of a thin film. **TRANSFER MATRIX METHOD** (TMM), a theoretical technique in order to explore the optical behavior of a thin film. This method is applied on a zinc telluride (ZnTe) semiconductor thin film and then theoretical results are compared with the experimental findings. This study leads us to explore multilayered structures like **PHOTONIC HYPERCRYSTALS**.

Keywords: Transfer matrix method; Optical properties; thin film; ZnTe

HUMIFICATION OF KITCHEN WASTE BY LACCASE ENZYME

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Abstract: Laccase enzyme was isolated from white root fungus, catalyze the oxidation of a variety of phenolic compounds and aromatic amines. It was tested with Guaiacol and Syringaldazine. The efficiency of crude laccase enzyme to expedite the kitchen waste composting process and to examine the physico-chemical characteristics during composting in controlled digestion unit. The temperature was raised which augmented the ammonification that gradually decline with maturity time. The pH of kitchen composting also exhibited near 8.9 at the end of process. The organic carbon and carbon nitrogen ratio decreased while total nitrogen, P,K, cation exchange capacity, humification index, degree of polymerization, humification rate increased. Further it was found positive correlation between these compost parameters like HA, FA, HI, DP, NO₃ and CEC. It was concluded that laccase enzyme encourage the decomposition rate and humification process.

Keywords: Humification; waste; Enzyme; Laccase

SECURITY AND PRIVACY ISSUES IN THE INTERNET OF MEDICAL THINGS

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Abstract: Internet of Things (IoT) is a system that covers almost all real-world things to communicate with each other through sensors. The fast development in the industry of IoT in past few years enabled the users to exchange seamless data among sensor devices. The health of the patients is the key element in the healthcare practice. The use of IoT can enhance the data analysis, and quality of service for the patients. The Wireless healthcare system brought tremendous changes, improvement, and provides facilities to the patients as well as to the hospitals. The security and privacy issues in the IoT is still challenge for the users and in the healthcare scenario, these challenges become more advance. In the healthcare scenario, it is essential for the researchers to dig out the latest and more severe security and privacy challenges. Therefore, the article examined the current challenges to Internet of Medical Things regarding Security and Privacy, the roadblocks to implement security frameworks, guidelines, models, and solutions.

Keywords: IoT; Sensors; healthcare; Security and Privacy

FRAMEWORK FOR THE ADOPTION OF INTERNET OF MEDICAL THINGS

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Abstract: The Internet of Medical Things (IoMT) is a new term in the field of Information Technology and it plays a vital role in the monitoring of patients, develop remote hospitals, and medical information system. Now in days, healthcare issues are increasing day by day and patient expected a quick response from doctors or hospital to rescue. Although, there are several solutions that are available to cater these challenges but the development of IoMT must ensure the security of the patients, maintain the privacy of the patients, and other healthcare activities. Keep tracking the patient health care activities are still a challenge for the researchers. Therefore, authors proposed a generic solution relates to healthcare system for the patients who are at risk and intensive care is required. The proposed system will generate alters and advices to the doctors or concerned medical staff about the real time values of the patient health and its movement so that relative measures may be taken within stipulated time.

Keywords: Internet of Medical Things; Healthcare; Security

STRUCTURAL, MECHANICAL AND THERMAL PROPERTIES OF CEMENT: EFFECT OF FRACTIONAL ADDITION OF RICE HUSK ASH

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Abstract: It has been established that Rice Husk Ash (RHA) contains large amount of Silica and causes environmental problems, if left to burn. An inevitable and preliminary interest of the current work was to investigate the effect of partial replacement of RHA in ordinary Portland cement (OPC) regarding variation in its compressive strength, thermal conductivity and structural properties. The RHA was obtained via controlled burning followed by grinding and replacement with OPC. RHA has been added at various percentages from 10 to 50% with an incremental step size of 10%. The properties of final product have been investigated after preservation of the samples for 3, 7, 14, 21, 28, 56, and 90 days. The study reveals that samples containing 10% of RHA exhibit maximum compressive strength of 2066.33 Psi with density of 2.65g/cm³ when cured for 28 days. Due to high relative humidity and temperature after 28 days the strength was slightly lower than specimen preserved in water. The thermal conductivity measurements revealed that sample with 50% of RHA exhibit minimum thermal conductivity as 0.81 Btu/ft²/hr/⁰F while maximum thermal conductivity was obtained at 10% RHA replacement. XRD analysis showed a significant transformation in phase and crystallinity of the mixture. Average crystallite size of pure RHA was 2227.69 Å, however for mixture, the crystallite size was observed to be 712.2 and 162.77 Å with 10 and 40 % of the RHA, respectively. This study concluded that partial replacement of RHA in OPC provides a low cost and insulating building material for construction industry.

Keywords: Rice husk ash, compressive strength, thermal conductivity, XRD, OPC

MODIFICATION IN ELECTRICAL AND OPTICAL PROPERTIES OF ZNO THIN FILM BY CU ION IMPLANTATION

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Abstract: ZnO thin films have been prepared on flexible PET substrate by using DC reactive magnetron sputtering at different argon oxygen gas ratios. The as prepared films were characterized to investigate their structural, optical and electrical properties. The optimized films were obtained at Ar:O=90:10 ratio with good crystallinity. The optimized films were implanted by copper ions of different doses by the help of pelltron accelerator. Ion implanted films have been investigated by the x-ray diffractometer, UV-Vis spectrometer and four probe technique. At lower doses of copper ions the crystallite size of ZnO thin films decrease and it started to increase at higher ion doses. Furthermore lattice parameter decrease with copper ion incorporation in ZnO which confirms the substitution of Zn by smaller ionic radius Cu. The best quality copper implanted ZnO films were obtained at higher ion dose with improved band gap and lower resistivity. The ion implanted films were further used for the fabrication of MSM UV photodetector and characterized to test the I-V characteristics. Copper ion implanted ZnO based MSM detector exhibited the improved rise and decay time.

FEEDING OVERLAP INVESTIGATION BETWEEN HYPOPHthalmichthys molitrix AND CYPRINUS CARPIO FROM PUNJAB, PAKISTAN

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ABSTRACT: Freshwater ichthyofauna is facing an intensive stress as a result of urbanization and growing industries in Pakistan. The alien fish species are considered as one of the major challenge due to their deleterious effects. Feeding habit analysis is a basic tool to evaluate the ecological stress on fish species residing at different habitats. The

present study was designed to disclose the feeding overlap between *Cyprinus carpio* (Common Carp) and *Hypophthalmichthys molitrix* (Silver Carp) from Head Marala (river Chenab) and Mangla Dam (river Jhelum). For this purpose, 20 samples (10 from each site) of each fish species (40 in totals) were captured (from March to May 2022) and analyzed at the Department of Zoology, University of Sialkot through gut content analyses. Results indicated that there was a significant feeding overlap with Schoener index value of 0.65 and 0.89 at Head Marala and Mangla Dam respectively between two exotic fish species (Schoener index values range from 0-1 where 0 = no overlap, 0.40 – 0.59 = highly non-significant overlap, 0.60- 0.99 = highly significant overlap and 1 = complete overlap). It is observed that aquatic ecosystem of Pakistan is being depleted, where highly generalist feeder invasive fishes have interspecific feeding overlap. It is recommended that management of freshwater ecosystem and resident ichthyofauna should be treated at top priority; otherwise these may embrace an inevitable and incalculable loss. This functional base line data will help the land managers and aquaculturists to conserve the freshwater ecosystem of Pakistan.

Keywords: Alien invasive fish species, Gut content analysis, Schoener index, Freshwater ecosystem, *Cyprinus carpio* and *Hypophthalmichthys molitrix*

LOUD GAMING: THE FUTURE OF HIGH-QUALITY GAMING ANYTIME, ANYWHERE

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Abstract: Cloud computing is transforming the gaming industry by providing new ways to create, distribute, and consume games. With cloud computing, game developers can access powerful computing resources and tools to create and test games more efficiently while reducing development costs and time-to-market. Cloud gaming, on the other hand, allows gamers to play high-quality games on demand, without the need for expensive hardware or software, and from virtually any device, anywhere. Cloud gaming platforms use cloud infrastructure to run games remotely and stream them to users over the internet, reducing the need for local hardware and improving the gaming experience, including graphics, sound, and multiplayer features. In this talk, I will discuss the innovation and growth introduced by cloud computing in the gaming industry.

Keywords: Cloud Gaming; Graphics; Streaming

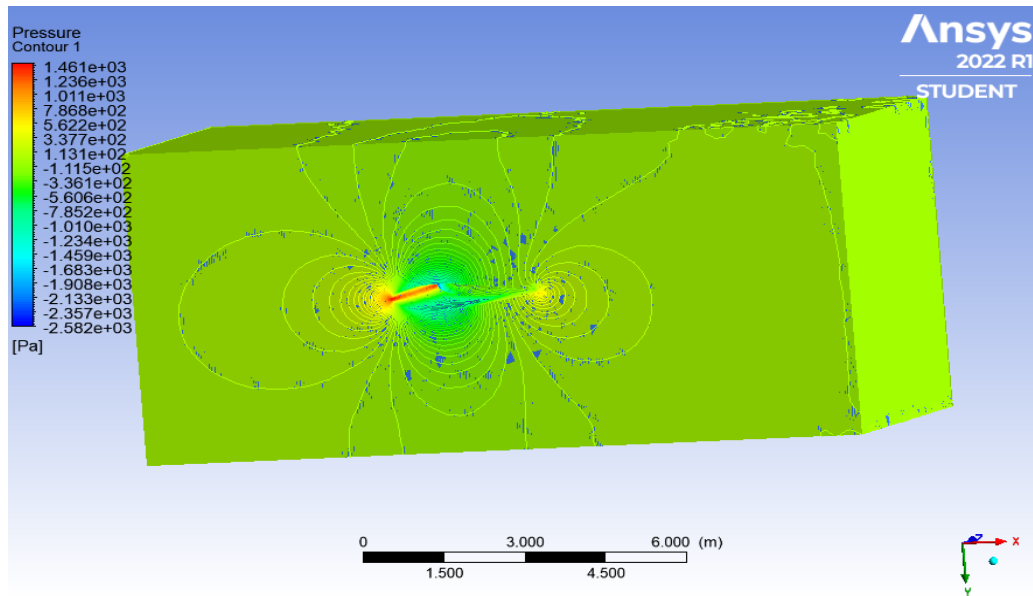
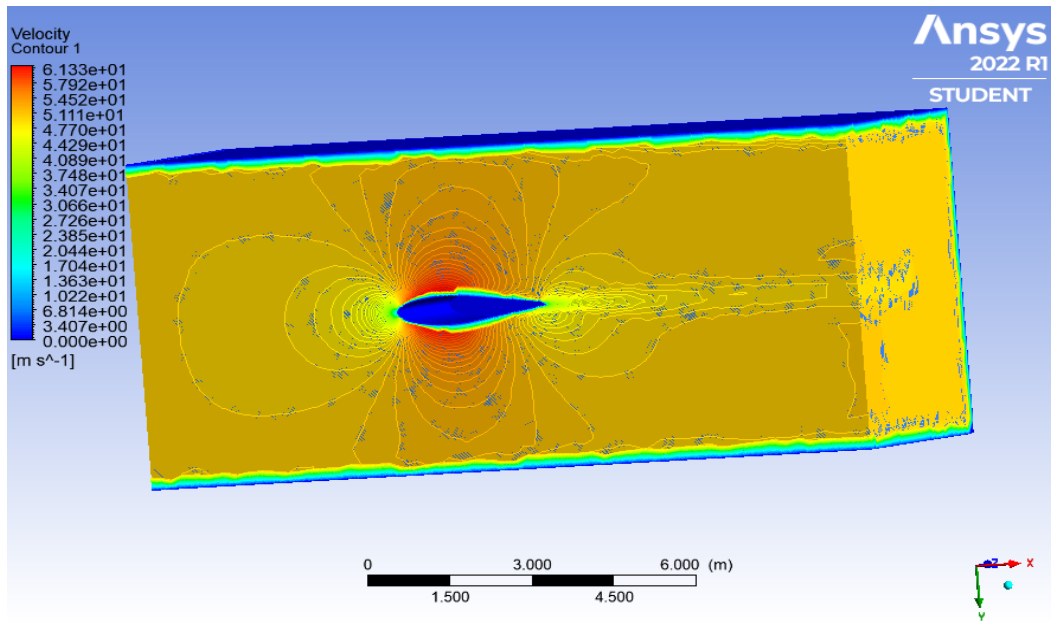
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ANALYSIS OF AERODYNAMIC LIFT FOR AN AIRFOIL

Muhammad Shehzad Arif¹, Muhammad Javaid Afzal¹

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Abstract: There are different parameters of an airfoil that affect the upward lift of an aircraft during the motion of the aircraft through the air. Different researchers found these parameters for different airfoils to generate the maximum lift. They found the values of pressure and velocity of the different airfoils at different angles of attack. They found the different parameters of airfoils at lower angles of attack. The NACA (National Advisory Committee for Aeronautics) 4412 was used in this research paper because of its availability, lightweight, and lower negative ground effects. The chord length of the airfoil was kept at 1 m to get the best design for this simulation. ANSYS fluent solver, velocity formulation, and steady time were used for this simulation. The computational fluid dynamic meshing with the pattern of triangular form was used to perform this simulation. The lift and drag coefficients were 0.49 and 0.55, increasing from 0 to 20 degrees. The pressure on the lower surface of the airfoil was 1.49×10^3 Pa and the velocity on the upper surface was 61.8973 ms⁻¹. A great accuracy has been achieved at 16 degrees. All the parameters were used to find the maximum upward lift for the NACA 4412 airfoil.



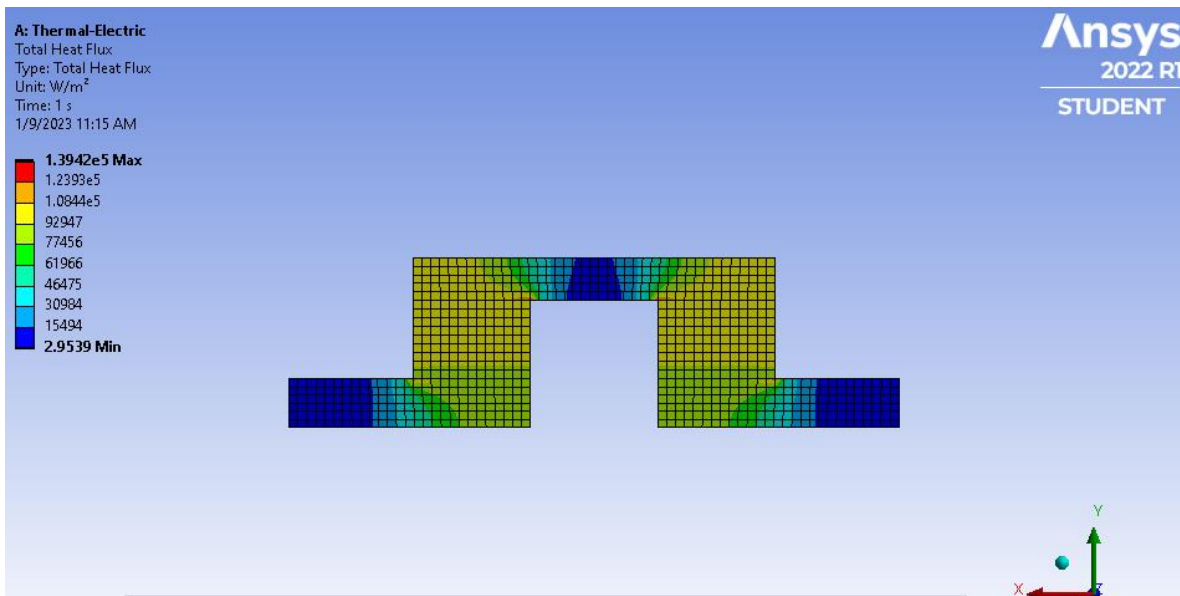
Keywords: ANSYS Fluent; Aircraft; Airfoil; Coefficients; Drag Force; Lift Force.

ANALYSIS OF TOTAL THERMOELECTRIC HEAT FLUX OF THROUGH ANSYS THERMAL ELECTRIC

Bilal Arshad¹, Muhammad Javaid Afzal¹

¹Government Islamia Graduate College Civil Lines, Lahore

Abstract: People today must deal with difficult issues like the worsening energy crisis, industrial pollution and the impact of climate change. Globally, researchers are working on enhancing power production through cleaner means in order to reduce the impact. Recovering waste heat and converting it to electrical energy is a very effective method of battling global warming. Among the many various ways to recover waste heat, the thermoelectric device, which has no moving parts and can transform waste heat straight into electricity, is the most favored. There have been several studies on thermoelectric modules for more than 180 years since the Seebeck effect was discovered. The Seebeck effect has demonstrated that thermoelectric generators (TEGs) are device which has the capability to convert heat produced into electrical energy. Thermoelectric generators are ideal for integrated systems as they can be employed anywhere. This study discovered that when temperature differences increased, the heat flux which is something to keep in mind while designing a thermoelectric generator. The outcome demonstrates that when the temperature difference rose, the thermoelectric generator's maximum heat flux increased continuously to 1.3942×10^5 W/m². The temperature differential between the connections of the thermoelectric generator at $\Delta T = 565$ °C is taken into account when computing the maximum total heat flux value.



Keywords: Seebeck effect, heat flux, temperature difference, thermoelectric generator

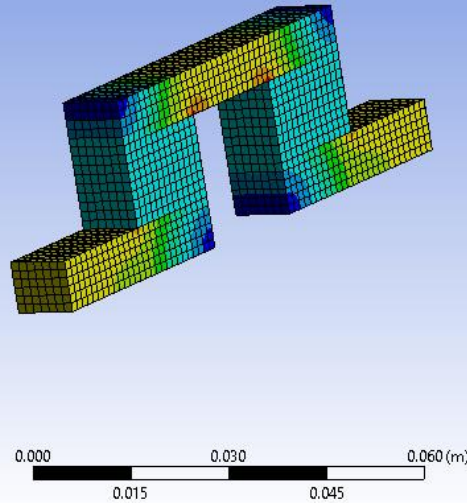
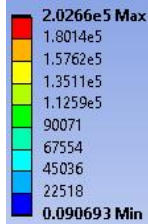
STUDY THE TOTAL CURRENT DENSITY THROUGH ANSYS THERMAL ELECTRIC.

Saddam Ashraf¹, Muhammad Javaid Afzal¹

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Abstract: Currently, individuals have to deal with challenging problems like the escalating energy crisis, environmental pollution, and global warming. To reduce their effects, scientists are concentrating on improving energy-harvesting power generators. A very successful way to combat global warming is to recover waste heat and convert it to electrical energy. The thermoelectric module, which has no moving components and can convert waste heat directly into electrical energy, is the most anticipated option to recover waste heat among the numerous other methods. The Seebeck effect has demonstrated that thermoelectric generators (TEGs) can transform thermal energy directly into electrical power. Because they may be used everywhere, thermoelectric generators are perfect for integrated systems. It was shown in this investigation that a growing temperature differential led to a progressive increase in maximum total current density, which was recorded as $2.0266e5 \text{ A/m}^2$. This outcome is simulated at a junction of a thermoelectric generator with a temperature difference of 150°C .

A: Thermal-Electric
Total Current Density
Type: Total Current Density
Unit: A/m²
Time: 1 s
1/27/2023 9:00 AM



Total Current Density

Keywords: Seebeck effect, temperature difference, thermoelectric generator, Current density, Current

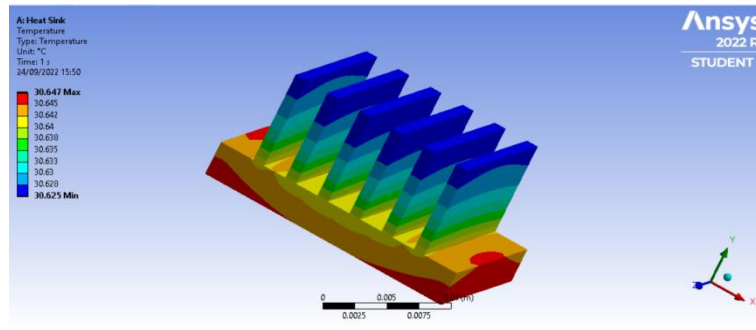
TEMPERATURE SIMULATION OF HEAT SINK

Muhammad Asghar¹, Muhammad Javaid Afzal¹

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Abstract: An electrical device heat sink is the subject of experimental study. The huge rise in power densities seen in microelectronic devices is due to recent advancements in semiconductor technology. For high heat fluxes, conventional air cooling is insufficient; alternative thermal management systems must be taken into account. Several theoretical and experimental research on various facets of this topic have recently been completed and published. Since it negatively affects a number of electrical properties, a large temperature differential is not ideal for the operation of electronics. Because the switching times of the fundamental elements of electronic circuits shorten with temperature, electrical-thermal instability, for instance, emerges in high temperature regions in electronic devices. The results of

the study show that the temperature (30.647 °C) of the heat sink increased continuously due to the increasing heating effect.



Temperature

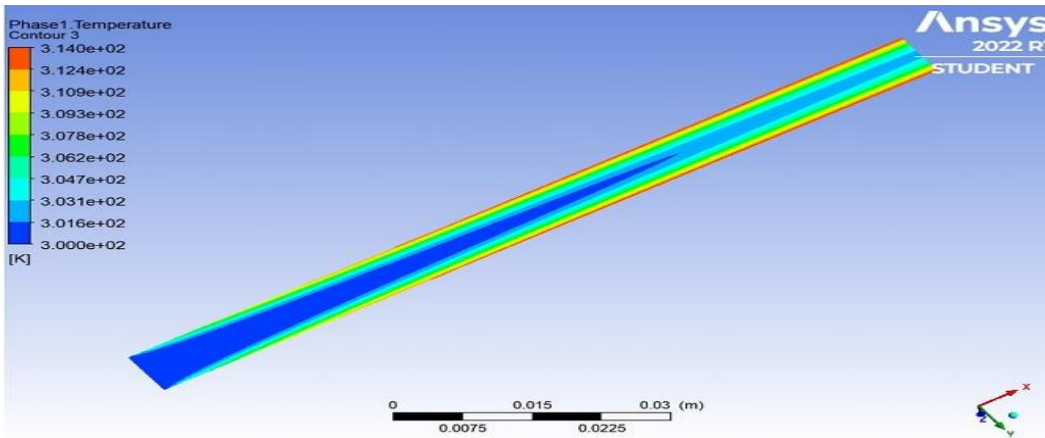
Keywords: Light emitted diodes, Thermal interface material, Junction temperature, case temperature.

CuO NANOPARTICLE HEAT TRANSFER ANALYSIS USING ANSYS

Nazim Ali¹, Muhammad Javaid Afzal¹

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Abstract: The capacity to change temperature is crucial for cooling industrial processes. In industrial systems, cooling is accomplished using a variety of techniques and fluids. Convective heat transfer is looked at in this study. The fundamental fluids are determined by temperature, thermal stability, and heat transfer efficiency. When nanoparticles are incorporated into the basic fluid, thermal properties are enhanced. One of this evolution's most astonishing side effects is nanofluid. This study uses CuO nanofluid at the entrance side and outlet side of a micro-channel pipe with 4 mm of diameter along with 110mm of length to analyze heat transfer and temperature change. The geometry is composed of 48861 nodes and 48000 components. We have a paper explaining a clear procedure for using CuO nanofluids with ANSYS Fluent to examine the effects of several performance optimization parameters (temperature, heat transfer rate pressure, heat transfer coefficient, and pressure). Previous scientists and engineers looked into how CuO nanofluids affected the heat transfer coefficient, temperature change, heat transfer rate, and pressure drop. We have investigated, the temperature of the nanofluids was determined to be 300 K and 314 K, respectively, at the intake and outflow. It has been found that increasing the nanofluid's temperature, heat coefficient, thermal conductivity, and viscosity causes a decrease in pressure.



Temperature Contour

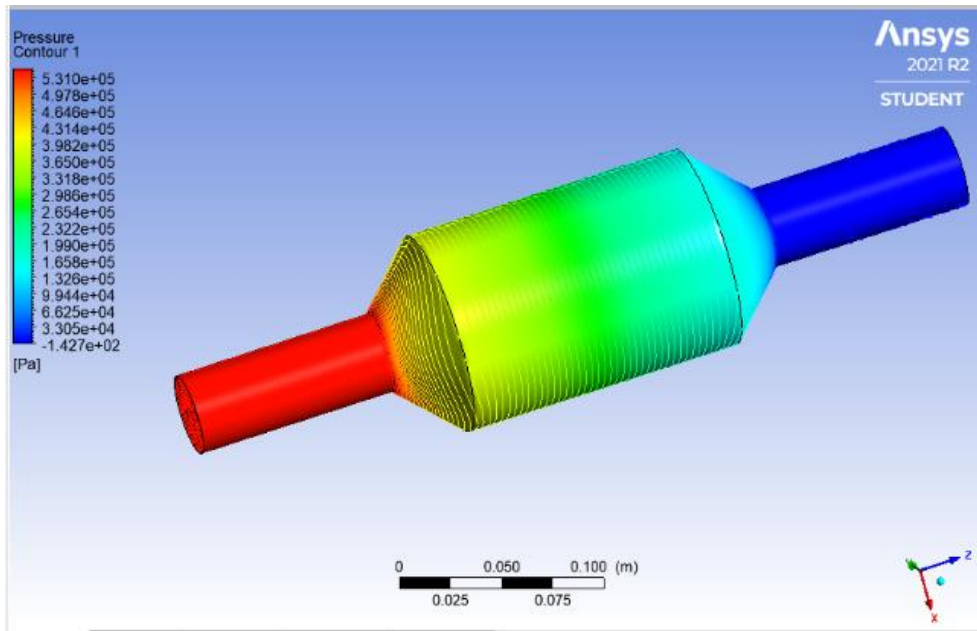
Keywords: Heat Transfer Coefficient, Nanofluids, Stability, Thermal Conductivity & Viscosity.

ANALYSIS OF THE CATALYTIC CONVERTER THROUGH ANSYS

Muhammad Sufian¹, Muhammad Javaid Afzal¹

¹Government Islamia Graduate College Civil Lines, Lahore

Abstract: Pollution was mainly caused by two chemicals created by automobiles: low-level ozone and photochemical smog. Carbon monoxide, carbonized hydrocarbons, and nitrogen oxides are dangerous gases that harm both people and the environment. A catalytic converter rids the air of harmful pollutants by transforming dangerous smoke into less dangerous gases. By transforming dangerous smoke to less dangerous gases, a catalytic converter gets rid of air of harmful pollutants. Catalytic converters are typically seen in vehicles. We provide a comprehensive physics-based model for the pressure drop and velocity increase via a honeycomb substrate for different channel shapes using ANSYS Fluent. This research uses ANSYS to simulate the catalytic converter (Fluent). The catalytic converter's length, density, entrance velocity, and outlet pressure have all been reported to affect it. The one-meter-long catalytic converter runs at 278.6 K. The pressure and velocity contours in the results were also produced using ANSYS (Fluent) for the same input values. The results are improved over models of earlier catalytic converters by three planes, each of which has two blocks for oxidation and reduction. In contrast to current catalytic converter models that only turn two problematic gases, this catalytic converter simulation converts three harmful chemicals into less dangerous gases. As a result, it operates more effectively than other converters.



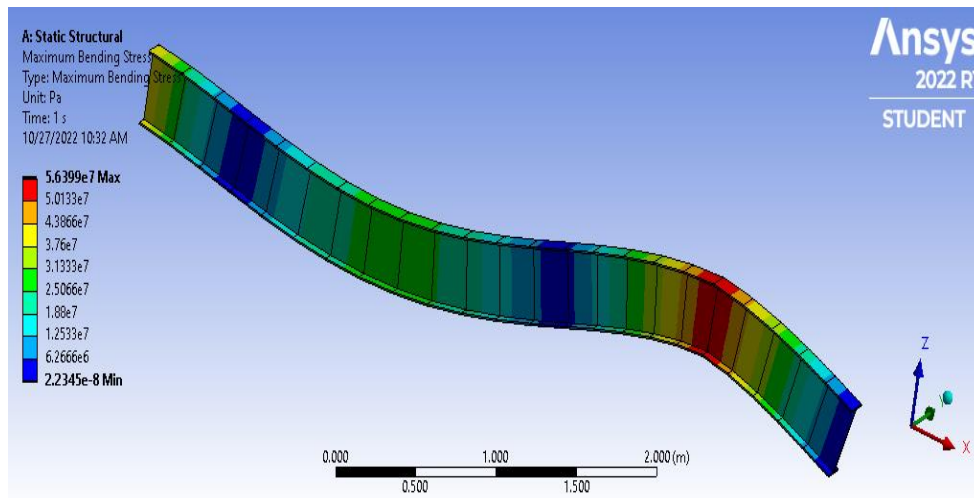
Keywords: ANSYS Fluent; Catalytic converter; Pollution; Vehicles

MAXIMUM BENDING STRESS ANALYSIS THROUGH ANSYS

Naeem Ul Rehman¹, Muhammad Javaid Afzal¹

¹Govt. Islamia Graduate College Civil Lines Lahore

Abstract: A structural steel product, a steel beam, is made to carry heavy loads. Steel beams are utilized in several ways while creating constructions and buildings since they are available in a wide range of sizes and types. The specification of a structure determines the geometry, size, and form of beams. In this work, I present an optimization procedure for a steel beam's maximum combined and bending stress. In construction, the beam is used to increase bending and shear strength. When a suitable hot-rolled segment does not fulfil the design criteria, they are also used. The analytical investigation was carried out using the ANSYS programme. Straight and curved beams are both recognized to transfer loads more effectively than one another. Also, they are strong enough of handling heavy loads. The accuracy and simplicity of the proposed model make it suitable to predict experimental investigations. The maximum combined and bending stress is $1.2873 \times 10^8 \text{ Nm}^{-2}$, $1.1772 \times 10^8 \text{ Nm}^{-2}$ by applying a force of $9 \times 10^4 \text{ N}$ respectively.



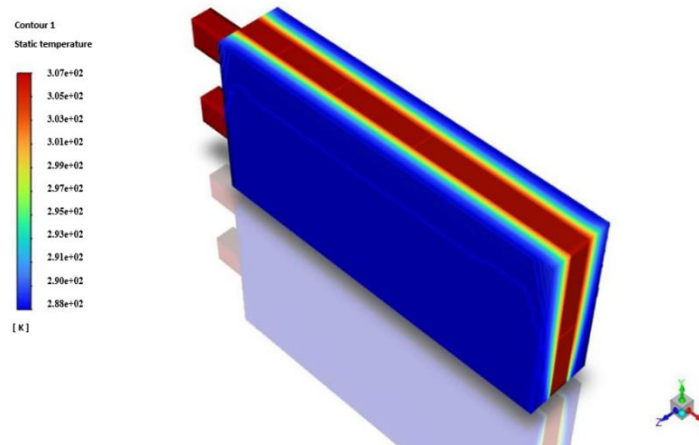
Keywords: Maximum Combine and Bending Stress, Pressure, and Force.

COOLING SYSTEM ON LI-ION BATTERY THROUGH ANSYS SIMULATION

Zia ul Qasmi¹, Muhammad Javaid Afzal¹

¹Government Islamia Graduate College Civil Lines, Lahore

Abstract: Unexpected heat production during lithium-ion battery operation might affect the battery's energy storage capacity and also the lifetime of the batteries. This problem is addressed by such an innovative cooling scheme based on an oscillating heat pipe. Due to the limited space available for electric cars, the cooling channel is located on the exterior of the battery module. In this research, a rectangular lithium-ion battery model was created using ANSYS/Fluent, and its functionality was assessed utilizing the cooling system on the battery cell. The fluid absorbed heat produced in the flow direction during the cooling operation, reducing the cooling capacity. It follows that the temperature downstream is always greater than the temperature upstream. The temperature in this procedure ranges from 288 K to 307 K. This could dramatically increase airflow and temperature distribution instability. Even if it affects the temperature difference between the passageways, the input temperature directly impacts the maximum temperature in the coolant channels. When a cooling system is present, the temperature of the battery rises gradually as opposed to rapidly when it is not. The cooling system, therefore, contributed to a better result.



Keywords: Li-ion battery, Temperature, Fluid, cooling ability, Improved Performance, Increase the lifetime.

ECOLOGY & DIVERSITY OF URBAN & SUB-URBAN BIRDS OF VEHARI, PAKISTAN

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Abstract: The avifauna diversity of large populated and important agricultural district Vehari in Punjab province was assessed from last 6 months. This research study was planned to assess the avian diversity of urban and sub-urban areas of district Vehari. The ecological complexity of urban settings, i.e. the diversity of elements and the spatial and temporal dynamics of cities, prevents simple beginning points and explanation lines from being possible. We may gain a better understanding of the incidental relationship between urban areas and biodiversity if cities are compared using appropriate measures and appraised in terms of urban biodiversity. Three approaches are utilized to monitor ecological systems: embedded city, urban patches, and urban matrix. The data was collected through the visit of areas, e.g., railway station, urban home town and park to record the diversity indices. A total 25 avian species were noted from urban and sub urban areas of Vehari. It was noted that diversity was rich in sub-urban areas as compared to urban. It also noted during this study that food, shelter and nesting habitats are the main sources that attract avian species.

Keywords: Urban; Ecology; Diversity; Sub urban

ACADEMIC RESEARCH TOWARDS TECHNOLOGY ENTREPRENEURSHIP IN PAKISTAN

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Abstracts: Academic & Technology Entrepreneurship is the relationship of higher education, technology, innovation with the business or commercial aspects of the proposed product. A Technology Entrepreneur is a person who studies, develops and incubates the academic idea into technological innovation/invention. Due to its global importance, few Colleges/Universities in Pakistan are now taking interest to teach and train the skills to student in the domain of entrepreneurship that may have tremendous impact on generating innovative ideas. This potentially enhance the economic value of a technological innovation by developing alongside a good network of these innovators/entrepreneurs widely in the region through their incubators and scientific and technology parks. In developed countries, EU, USA etc., many young entrepreneurs start up their spin off companies at their universities via in-house facilitation, training, but in developing countries like Pakistan opportunities are scare and there are many challenges yet to be faced by new starts up. Policymakers, Academicians, Researchers and Technological experts and Industries must turn their heads into innovation and development in Pakistan to practically motivate and inspire the current and coming generation to explore the excitement and freedom of being a Technology Entrepreneur. Here we explore various opportunities and related threats where billion-dollar market may be attracted to academic and technology entrepreneurship, where it may facilitate the strangling economy of Pakistan.

Keywords: Technology entrepreneurship, High Education, Developing economies, Business Incubation Centers

ROMAN URDU TWEETS HATE SPEECH DETECTION WITH TEXT MINING: A SYSTEMATIC REVIEW

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Abstract: Rapid growth of internet has increased activity on social media specially twitter; with the freedom of speech, every individual can express his ideas, views freely without any restrictions. People views can be positive or negative. Hate speech is also spreading very fast and getting out of control. The text mining mechanism is helpful technology, which used to identify hate speech. Many researches has conducted to detect hate speech on social media platform. The purpose of this systematic literature review is to evaluate research trends, identify data sources, and analyze reviews, methodologies and features extraction techniques in order to identify hate speech. Hate speech got research attraction from many researchers. Until early 2022, hate speech found against the women, religion, politics, racism, sexism, minorities and general election agenda. Twitter is the prominent short text data source (data corpus) which has used. Hate speech can categorized into Hate speech and Not Hate speech as well as it will further sub categorized into offensive, threats of violence and sectarianism. As per criteria of inclusion and exclusion, 15 studies has selected in this systematic literature review for analysis. However, the criteria of features selection and methodology utilization in the selected studies do not provide assurance for good performance regarding hate speech detection. The performance has effected by dataset type, its features and attributes pattern selection and belongs to which type of data classes.

Keywords: Hate speech detection, Label, Feature, Classification

SINDHI GENRE RECOGNITION

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Abstract: In past decayed researchers try to address the different types of problems related with music information retrieval where deep learning models and approaches are helpful. In this paper we try to solve mostly occurred of problem these are genre recognition from common piece of music, basically the genre recognition is already solved by many researchers with different types of techniques but there is no work is done for sindhi audio files. The audio files that we selected are songs of sindhi singers. For the music recognition first we separate the vocal features of singer from background music to clearly excerpt the features than we extract music features in which we select number of different music features and with the help of Bayesian theorem we perform music recognition for genre and singer, the Bayesian theorem help to train the system with given dataset, after training of models we test our classifier with different unknown audio files and the results are accurate the system will identify the singer as well the genre of the song from same segment of file. For the data set we use 60 different sindhi male and female singers' audio files and different types of genre these are rock, pop, jazz, blues, country music, folk and classic to classify the genre.

Keywords: Genre Recognition; Bayesian Theorem; Deep Learning

THE OPTICAL AND PHOTOLUMINESCENCE INVESTIGATIONS FOR NANO-FIBROUS ZNO/NIO THIN FILMS VIA CHEMICAL BATH DEPOSITION METHOD

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Abstract: Doping of semiconductor material zinc oxide with nickel has gained importance in optoelectronic applications. In this work, nickel doped zinc oxide (Ni_xZnO , $x=0, 5, 10, 20, 30$) nano-fibrous films were deposited by chemical bath deposition method. More fibrous nature of the film surface was found for higher doping percentages of nickel, elucidated by SEM images. All the deposited films produced transmission greater than 70%. The band gap value of 3.37 eV revealed for higher doping concentration. Furthermore, a refractive index, extinction coefficient, optical conductivity and photoluminescence (PL) studies were also explored.

Keywords: ZnO; Semiconductor materials; Bandgap

RFID BASED PREDICTION FOR THE REQUIREMENT OF DIALYSIS USING FUZZY ANALYSIS

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Abstract: With the prevailing need for automation, data storage and transfer in the field of bio-medical, RFID tags are gaining momentum in order to predict the disease and the treatment requirement as well as patient monitoring. These tags when used with chip and battery are considered as a low cost and efficient way to reduce any negative impact created in human body due to transfer of the radiations. Similarly, patients with hazardous diseases like kidney failure require medical treatment with any hazardous radiation transmitted in their body. The work provide a chip less RFID based system on hemo-dialysis requirement and prediction. The data from the RFID system for the patient is taken when the RFID tag when it

appears in the close vicinity to the receiver. The tag provide the requirement and urgency to the hemo-dialysis treatment thus results in reduction in the pain associated with the dialysis process.

Keywords: RFID; Fuzzy Analysis; Chipless technology; Hemo-dialysis; Biomedical

AI BASED DETECTION AND TARGET PREDICTION OF AIRCRAFT IN NIGHT VISION BY USING SOFT COMPUTING TECHNIQUE

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Abstract: In this work we predict the AI based target prediction of aircraft by using soft computing technique using the night vision technology in this work we take three inputs and to two output produced using the fuzzy logic (a MATLAB prediction tool). Night vision technology was mainly developed for Defensive purposes. It was firstly introduced by the U.S. Defense department, but with the enhancement in the night vision devices, it gives an easy approach to access or controls our defense system in our day-to-day life or in the field of armed forces. The parameters for the target prediction for input are the aircraft direction, velocity, night vision (image intensifier) and time. Output can be taken as the by two parameters the one is aircraft recognition and target identifications. The fuzzy logic allow us to predict that how can be a aircraft can be detect and recognized]. These systems support a wide range of military operations to carry out, particularly under the circumstances that would not otherwise have been possible without pilot. This system will be accommodating the armed forces to strengthen their defense mechanism in nights against the combatant with the help of artificial intelligence.

Keywords: Artificial Intelligence; Fuzzy Logic; Defense; MATLAB

FLC SIMULATION OF MICROCHANNELS CREATED BY SILVER MICRONEEDLES FOR ENHANCED DRUG DELIVERY

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Abstract: Microneedles are MEMS based microfluidic devices that have gained attention nowadays due to their adverse biomedical applications ranging from drug delivery to the skin and eye treatment and now even malaria tests are also been conducted using microneedles patches. Different materials like metal, polymer, silicon, etc. have been used to fabricate microneedles and tip diameter of different micron ranges has been made. In this research paper, FLC simulation of microchannels created by silver microneedles tip has been done by varying the length and tip radius of microneedle to determine the average depth and surface diameter of microchannels created in the skin when microneedles are inserted. The results developed show that the average depth of 150.5 μm and a surface diameter of 65.7 μm has been calculated when tip radius is of 5 μm and length of microneedles is of 650 μm . Thus, the variation recorded is 0.08% for percentage error in the calculated results and MATLAB simulation which confirms its accuracy.

Keywords: MEMS; FLC; Microchannels; Microneedles

POWER CONSUMPTION IN A SMART POWER GRID STATION USING FUZZY LOGIC

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Abstract: Smart Power Grid station is an advanced electricity power generation, delivering and consumption system. So basically, in the smart power generating system, the energy is going to be monitored, metered and managed through proper systems. In such systems a lot of data is exchanged from the consumer end to the electrical end. In Smart Power Grid station bidirectional data communication system occur. Meters and sensors

are used across transmission lines and associated technologies in Smart Grid Stations to successfully monetize and utilize the power station's energy. Another trend shift would be a decentralized power grid or power producing system. We must use dependable power supply and minimize failure rates to increase Grid reliability. As a result, whether from solar, wind, or another source of energy, we'd have a distributed power generating system. The Smart Power Grid Station will manage all these power generating stations, which will be used more effectively. Moreover, to get the more effective results we will be using Fuzzy Logic, as there are no proper formulas of math to solve such problems and increase the efficiency of generating, delivering and utilizing power generated by different reliable and non- reliable sources. All type of advance systems are based on Fuzzy Logic, because it provides us the environment to conclude results that are more executable to the real life.

Keywords: Fuzzy Logic; Smart Grid Systems; Transmission; Monitoring

Fuzzy Logic-based LiE Detector

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A**bstract:** This work presents the development of a fuzzy logic-based lie detector system. The objective of the study is to provide a more reliable and accurate method of detecting lies by integrating fuzzy logic with physiological measurements. The proposed system uses a combination of sensors to measure physiological signals such as heart rate, skin conductance, and blood pressure, which are then processed using a fuzzy logic algorithm. The system operates by comparing the physiological responses of a subject during a baseline period and when they are asked questions. The fuzzy logic algorithm is trained using a set of sample data to generate rules that associate the physiological signals with the subject's truthfulness. The system then uses these rules to evaluate the physiological measurements of the subject in real-time and make a determination on whether they are telling the truth or not. The study demonstrates that fuzzy logic-based lie detection can provide a more accurate and reliable method of detecting deception in comparison to traditional lie detection techniques. In conclusion, the proposed fuzzy logic-based lie detector system offers a promising approach to detecting lies by integrating physiological measurements and fuzzy logic algorithms. The study provides evidence that the proposed system has the potential to enhance the

accuracy and reliability of lie detection, which can have significant implications for fields such as law enforcement, national security, and human resource management.

Keywords: Fuzzy; Detector; Security; Measurements

FUZZY ANALYSIS OF ANODIC ALUMINUM ANODIZATION (AAO) FOR WATER FILTRATION METHOD USING SOFT COMPUTING TECHNIQUES

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Abstract: The old manually water filtration method is still operated in most areas of the world. The major drawback is that there is no mechanism to monitor water quality before and after filtration, and the filter membrane gets smudged due to a large number of leftovers present in it after each cycle. Hence it is required to clean water by varying the pore size of membrane according to grime present in water. In this regard anodic aluminum anodization (AAO), has received enormous consideration in the industry because of its widespread practical applications. It is an easiest approach to examine the water purification where the water is purified by varying nano pore structure ranging from 50-1000 nm and by controlling anodic conditions like electrolyte morality, temperature we intend to get clean water. Electrolyte morality and process temperature will be taken as inputs where pore size and purification percentage will be taken as outputs; hence the correlation between various parameters of anodization will be optimized.

Keywords: Fuzzy Logic; AAO Membrane; Morality; Temperature

FUZZY ANALYSIS FOR ROMAN URDU HATE SPEECH TWEETS

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Abstract: Hate speech is defined as language that targets and discriminates against a specific group of people, and can be derogatory and abusive. In Pakistan, the Urdu has written in the form of Roman Urdu alphabets, which comprises of Urdu words written in English and is widely used on social media platforms, particularly on Twitter. Fuzzy logic is a mathematical technique that allows for the handling of uncertainty and imprecision in data. It is particularly useful for analyzing complex linguistic features, such as those found in social media text. The study aims to provide a better understanding of the intensity of hate speech in Roman Urdu tweets by analyzing the linguistic features of these tweets using fuzzy logic. The results of this analysis can be used to develop more effective methods for identifying and preventing hate speech online. By understanding the intensity of hate speech in Roman Urdu tweets, the study can contribute to developing more effective methods for combating hate speech online. The findings of the study may also be useful for social media platforms and policymakers in developing strategies for preventing and removing hate speech content from their platforms. Overall, this study demonstrates the importance of utilizing advanced analytical techniques, such as fuzzy logic, to gain a deeper understanding of the language used in social media and its potential impact on society.

Keywords: Hate speech detection, Tweets, Fuzzy Logics

ANALYSIS OF MATERIAL PROPERTIES IN A HEAT EXCHANGERS USING ANSYS

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Abstract: The heat exchanger's dependencies on temperature difference, thickness, and length. The material has a sharp 288.6 k temperature difference and is 45 mm length and 22 mm thick. When compared to the usual heat exchanger formulation, ANSYS generates results with a percent error of 1.59 percent. These simulations demonstrated that the heat exchanger has an inverse relationship with thickness and a straight connection with temperature differential and material length. An apparatus designed to efficiently move heat from one substance to another is a heat exchanger. Heat can be transported by moving air or a liquid, such as water or gasoline.

Keywords: Heat Exchanger; ANSYS; Temperature; Material

SOFT COMPUTING TECHNIQUE TO STUDY THE FACTORS INFLUENCING THE TEACHING QUALITY OF HIGHER EDUCATION

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A**bstract:** With the technological advancement and modernization in the society, there is dire need to stay aligned with the advancement in educational tools. A detailed study was conducted to analyze the factors influencing the quality of higher education in line with the current progress in educational system. The exact factors that create great impact on the improvement and progress of the higher education was considered to foresee the impact. In this work, Soft computing technique such as fuzzy logic has been used in order to predict the impact of various parameters on the quality of higher education. The MAMDANI model was used to predict the impact of teacher to student ratio, classroom environment, learning resources, modern tools, management efforts and academic support on the higher education. Improvement of these parameters can enhance the thinking and capabilities of students. Analysis showed by improving these factors, the quality of education can be enhanced. High quality teaching leads toward the better society with great economic power.

GREEN BASED BIO-SYNTHESIS OF NICKEL OXIDE NANOPARTICLES AND EXAMINATION OF THEIR ANTIBACTERIAL EFFECTS

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Abstract: Green synthesis is one of the most ecofriendly and easy approaches to produce metal oxide nanoparticles. In green synthesis, biomolecules extracted from plants, fungi, and/or bacteria, are used. Several plant extracts have been used to synthesize nickel oxide nanoparticles (NiONPs). This study's goal is to prepare NiONPs by green synthesis that is eco-friendly and inexpensive approach. The NiONPs were synthesized using the *Butea monosperma* seed extract as a reducing, potential stabilizing and chelating agent. The morphology, crystallinity and shape of synthesized nanoparticles were studied by using characterization methods, UV-visible spectroscopy and X-ray diffraction (XRD). The XRD pattern of NiONPs exhibit face centred cubic crystalline structure. UV-visible examination revealed a band in the range of 250-350 nm, indicating the formation of NiONPs. The antibacterial activity of NiONPs were show significant inhibitory activity against different bacterial strains. The area of inhibition for *Bacillus subtilis* was observed (18.3±0.4) mm and for *Staphylococcus aureus* observed (16.3±0.4) mm showed good antibacterial potential of synthesized NiONPs. It is expected that NiONPs synthesized through proposed methodology could be of great benefit for further clinical trials, drug designing and waste water treatment.

Keywords:

Green synthesis, NiO nanoparticles, *Butea monosperma* seed, UV-Vis, XRD, antibacterial activity

SEASONAL DYNAMICS OF SUCKING PESTS AND THEIR PREDATORS IN COTTON AGROECOSYSTEMS OF DISTRICT VEHARI, PUNJAB, PAKISTAN

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Abstract Cotton crops are extremely susceptible to damage by sucking pests, which can result in intolerable reductions in crop production. The purpose of this research was to document the seasonal dynamics of key phloem feeding pests in cotton field plots, such as whitefly, jassid, and thrips, as well as the seasonal dynamics of their enemies, such as spiders and green lacewings. Visual counting was the most effective approach for recording the number of insects while doing insect sampling and surveys. It was followed by net sweeping and tapping as the next most effective methods. The whitefly was the most prevalent phloem feeding pest identified from the cotton vegetation, followed by the jassid and the thrips. Throughout the growing season, fluctuating concentrations of predatory fauna (spiders and green lacewings) were documented. Different growth stages of the crop had also its impact on population densities of these pests and predators. Predatory fauna showed progressive increase in their number with the crop growth, and a similar trend was observed for phloem feeding pests as well. Both the vegetative and flowering stages of the crop were examined keenly for this purpose. Regarding abiotic parameters, the spiders had a significant positive connection with temperature and humidity. The only correlation that could be established between green lacewing and humidity was a positive one. On the other hand, there was no evidence of a significant association between the populations of whitefly, jassid, and thrips and either temperature or humidity. The overall densities of sucking insect pests, especially whitefly, were discovered to be higher than the economic threshold level. The altered habitats and multiple trap cropping should also be investigated in future studies to determine how these farming practices influence the natural insect predators and parasitoids that live in cotton crops.



Keywords: Cotton, Sucking pests, Spiders, Green lacewings, Seasonal-abundance.

PHYLOGENETIC ANALYSIS AND STRUCTURAL PREDICTION OF SELECTED NON-STRUCTURAL PROTEINS OF SARS-COV-2

Dr. Rabia Nawaz

Abstract: In the last month of 2019, a new disease appeared in Wuhan, China, later called Coronavirus disease 2019 (COVID-19). The causative agent is named Severe Acute Respiratory Syndrome Coronavirus-2 (SARS-CoV-2). It has four 4 structural proteins. Nonstructural proteins are encoded by virus but are not a part of viral particles. The sixteen 16 nonstructural proteins are NSP1 to NSP16. In this study, the In Silico analysis of SARS-CoV-2 selective non-structural proteins, NSP9 (4141-4253) and NSP11 (4393-4405) for the years of 2020, 2021, 2022 was performed. Phylogenetic analysis of NSP9 and NSP11 was performed through CLC-Sequence Viewer 8.0 version by the Neighbor-Joining method. The reference sequence of the 5 coronavirus variants Alpha, Kappa, Delta, Omicron, and Original China were taken to determine the similarities and differences between these sequences among different countries. We conclude that in NSP9 the rate of genetic mutation was far higher as compared to NSP11 which in turn means that NSP11 was more conserved. The structural prediction had been done in order to observe the protein sequences of Alpha, Delta, Omicron, and Original China for NSP9 and NSP11 of SARS-CoV-2 using the Swiss Model. In this study, we observed that the behavior of viruses and mutations of different countries are closely related to each other.

DRIFT WAVE INSTABILITY IN NON-UNIFORM QUANTUM PLASMAS

Dr. Jamil Alvi

Abstract: the study of drift waves that arise from the gradient of plasma density are studied. The dispersion relation and hence the instability is analysed on employing the multi fluid model for quantum plasmas. The contribution of quantum effects are pointed out like Bohm term and degenerate pressure