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Compilation of Research Articles (Scopus Index) by UniKL MITEC Researchers

TABLE OF CONTENTS

1

Title:
Raspberry Pi Based Driver Drowsiness Detection System Using Convolutional Neural Network (CNN)

Journal:
2022 IEEE 18th International Colloquium on Signal Processing and Applications, CSPA 2022.

Document Type:
Conference Paper

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https://www.researchgate.net/publication/360992496_Raspberry_Pi_Based_Driver_Drowsiness_Detection_System_Using_Convolutional_Neural_Network_CNN

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Abstract:
This paper presents the implementation of a drowsiness driving detection system using Raspberry Pi. Drowsy driving can be defined as a behavioral decline in driving skills. In this work, the Convolutional Neural Network (CNN) has been used to classify drowsiness symptoms such as blinking and yawning. A total of 1310 images were used to train the CNN architecture. A 4-layer convolution filter has been added as a layer in this CNN architecture. Adam optimization algorithm was then used to train the CNN. A real time study on the effectiveness of this prototype was conducted on 10 individuals. This proposed system successfully demonstrates a classification accuracy rate between 80% and 98%. Other factors that can affect the rate of classification accuracy, such as camera distance from the driver and lighting factors, are also studied in this paper.

2

Title:
Magnetic field effect on the nanofluids convective heat transfer and pressure drop in the spirally coiled tubes

Journal:
International Journal of Heat and Mass Transfer, Volume 110, 2017.

Document Type:
Article

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Abstract:
The experimental study has been performed on the convective nanofluids heat transfer characteristics and pressure drop in the spirally coiled tubes under the magnetic fields effect. The nanofluids flows into the spirally coiled tube at the innermost coiled turn and flows along the constant tube wall temperature and then flows out the test section at the outermost coiled turn. Three different magnetic fields strength of 0.12, 0.18, 0.23 μT are generated by the permanent external magnets. Effects of curvature ratios, nanofluids concentration and magnetic fields strength on the heat transfer and pressure drop are discussed. The obtained results are compared with the experiment without magnetic field under same condition which shows that the magnetic field effect increases the Nusselt number up to 16.97%, 25.83%, 31.15% for the magnetic fields strength of 0.12, 0.18, 0.23 μT, respectively. However, the enhancement of the pressure drop is slightly significant for under the magnetic field effect.

3

Title:
Sensing Coil Development in Measuring Magnetic Properties Material

Journal:
Advanced Structured Materials, Volume 174, 2022.

Document Type:
Book Chapter

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Abstract:
Magnetic materials are main components of complex technology in fulfilling the industry's basic demands. However, there are no effective instruments developed to determine the magnetic property of the material. Hence, this study aimed to develop sensing coils which are used for measuring the magnetic properties of materials. The developed sensing coils are calibrated, and the data is collected by LabVIEW before being used in analyzing the value of box coefficients. The calculated box coefficients, KB and KH, are 0.093314 and 0.005925, respectively. These box coefficients are important to ensure the accuracy of the magnetic properties measurement. To increase the reading accuracy in the future, it is recommended to justify the accuracy and precision of the coils, to increase the magnetic field produced by the solenoid by using the proper solenoid or using an AC converter, and amplify the induced voltage reading. As the conclusion, this study provided the precision measurement of magnetic properties which affects the total core loss. This is an important variable to consider when designing magnetic devices for optimum performance.

4

Title:
Sensor Application in the Logistics Integration Process in the Manufacturing Environment

Journal:
Advanced Structured Materials, Volume 174, 2022.

Document Type:
Book Chapter

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Abstract:
Sensor technology is one of the technology enablers widely used in the manufacturing process to improve efficiency and reliability. However, the sensor technology has attracted little attention in usage and application in the logistics function as compared to RFID, barcoding, and ERP. As such, this research aims to explore various issues related to the lack of sensor adoption in the logistics integration process in the manufacturing environment. The research adopted the qualitative method using the in-depth interview to unveil the themes related to the question in the study. The study identified various issues that hinder the adoption of sensors technology in the logistic area, particularly the failure to understand the logistics boundary in the manufacturing environment. This study contributed the knowledge on the sensor application in the logistics area in the manufacturing environment that can be used for future research.

5

Title:
Sustainable IoT-Based Environmental and Industrial Monitoring System

Journal:
Advanced Structured Materials, Volume 174, 2022.

Document Type:
Book Chapter

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Abstract:
This research studies the development of a comprehensive system that is represented as a sustainable IoT-based environment and industrial monitoring system based on applications of the wireless network. Environment pollution can cause damage to human health and causes global warming. Most pollutants are invisible to the human eye. The system created can detect pollution on early stages and as a precaution step. This system can detect the following quantities via some sensors: temperature, humidity, light of intensity, and gas. The main sensor that is attached to this product is to detect the air quality in the surrounding by giving reading values. This system is using internet of things (IoT) and the result is transferred to a phone by using the Blynk apps. After download the Blynk Apps, the position, functions, and connections must be set. The first steps are collecting data and to keep them save in the memory card. The next step is to transfer the data to a laptop by using internet of things (IoT). From the data shown at the laptop, the user identifies the status of the environment condition. This system is able to detect any pollution that occurred and can take action on early stages. In addition, the system is able to monitor the data statistically for further analysis and predict what is going to happen.

6

Title:
Temperature- and Strain Rate-Dependent Damage Mechanics of Solder/IMC Interface Fracture in a Ball Grid Array Assembly

Journal:
Advanced Structured Materials, Volume 174, 2022.

Document Type:
Book Chapter

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Abstract:
The damage mechanics concept introduced to assess the deformation and failure process of solder interconnects in electronic assemblies with ball grid array (BGA) assembly during reflow cooling, and subsequent temperature cycles are investigated. The test assembly consists of Sn-4.0Ag-0.5Cu (SAC405) solder arrays that provide an interconnection between an electronic package and the printed circuit board. Anand model of constitutive unified inelastic strain was employed to pronounce the temperature- and strain rate-dependent response of the SAC405 solder joints. The temperature-dependent cohesive model is also used to predict the damage process of the solder and intermetallic compound (IMC) interface fracture of SAC405 solder joints. Temperature loading consists of initial cooling down from the assumed stress-free reflow temperature of 220–25 °C, followed by a temperature cycle ranging from 125 to −40 °C at heating and cooling rates of 11 °C/min. Results showed that the most critical solder joint is located underneath the silicon die corner with the highest equivalent inelastic strain and von Mises stress under reflow cooling. The different straining rates experienced by the solder joints are driven by the temperature and strain rate effects of cohesive zone model parameter values. The highest predicted inelastic strain rate of 4.5 × 10–3 s−1 is found in the solder joint at 25 °C. Throughout the reflow cooling and temperature cycles, the damage propagation at the interface of solder and IMC is minimized. However, damage is initiated at the interface of solder and IMC plane and localized at a small edge region at the side of assembly package.

7

Title:
The chemistry insight: Epoxy sealant as an alternative remedial operation for well integrity

Journal:
Reviews in Chemical Engineering 2022.

Document Type:
Review

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Abstract:
Epoxy resin is commonly used in the oil and gas industry due to its excellent toughness, low shrinkage, good adhesive strength, and relatively good thermal resistance. It is used for water shutoff, zonal isolation, cementing, enhanced oil recovery, and preventing leakage in wells. This paper reviews the chemistry aspect of using an epoxy resin system as a sealant to prevent well leakage and it offers insights into the chemistry of the epoxy resin system, as applied in previous studies. The paper also unveils the reasons for the application of this system from the chemistry perspective, allowing this aspect to be better understood. Success in the investigated cases depended on the formulation design. The epoxide and hydroxyl functional groups have been found to contribute substantially to the excellent performance of the sealant system. Furthermore, the amine curing agent triggers the abrupt reaction of the oxirane ring to stabilise when the cured sealant is perfectly applied. Based on the findings, it is suggested that other types of epoxies, namely epoxidised oils, require further study. Finally, in terms of safety and sustainable energy, it is suggested that more curing agent and diluent studies are undertaken.

8

Title:
Understanding Critical Success Factors of Cloud Computing Implementation in Higher Education Institutions: Consensus Evaluation in Delphi

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Advanced Structured Materials, Volume 174, 2022.

Document Type:
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Abstract:
Cloud computing is becoming more apparent in the realm of network technology to ensure the availability and sharing of resources through virtualization. Despite its attractiveness and benefits, the higher education institutions (HEIs) are still hesitant to implement cloud computing services due to insufficient details on issues and priorities in implementing cloud computing services. Therefore, this study aims to evaluate the factors of cloud computing implementation in HEIs, propose the cloud computing implementation model, and encourage the research community to explore more research in cloud computing implementation. By synthesizing the literature from various industries, this study proposes a conceptual model-based cloud computing implementation for HEIs and integrates it into the technological, organizational, and environmental (TOE) framework. The research methodology consists of rigorous data collection and analysis that allows for more substantive conclusions to enable viable CC-LMS operation. The Delphi technique was adapted in the data collection and judgment process. The two-round Delphi survey has been conducted with 18 (1st round) and 13 (2nd round) cloud computing technology and LMS experts from local HEIs and service vendors to assist in the judgment process. This analysis resulted in a consensus after the second round of the Delphi survey with suggestions on the high importance of several factors in implementing a cloud computing system for LMS in HEIs. Finally, the study is expected to provide HEIs decision-makers with a better understanding and guidelines of cloud computing implementation characteristics with the relevant perception of current services.