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1

Title:
The Effect of Porosity and Contact Angle on the Fluid Capillary Rise for Bone Scaffold Wettability and Absorption

Journal:
Malaysian Journal of Medicine and Health Sciences, Volume 18, 2022.

Document Type:
Article

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Abstract:
Introduction: Wettability and fluid absorption are two important bone scaffold characteristics that determine proper cell attachment and flow of nutrition and oxygen. To imitate the human bone structure, the current study was carried to investigate the effect of the porosity of bone scaffold and contact angle of the fluid by evaluating the height of capillary rise. Methods: The structure was simplified based on the circle and square pattern and evaluated using Computational Fluid Dynamic (CFD). Porosity and contact angle were varied from 50% to 80%, while the contact angle ranged from 0 degrees to 60 degrees. The result was evaluated further using statistical analysis. Results: The CFD result was in agreement with Jurin's law (9% error). The height of capillary rise was found to be excellent for the square pattern, while the circle was found to work across all the investigated parameters better. The porosity was correlated with the height of capillary rise ($r = -0.549$). The strongest correlation happened to contact angle ($r = -0.781$). Conclusion: The study concludes that water absorption and wettability can be altered and improved based on porosity. Meanwhile, the height of capillary rise depends strongly on the contact angle.

2

Title:
The Evolution of Ergonomics Risk Assessment Method to Prevent Work-Related Musculoskeletal Disorders (WMSDS)

Journal:
International journal of online and biomedical engineering, Volume 18, Issue 8, 2022.

Document Type:
Article

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Abstract:
In the last few decades, numerous of ergonomics risk assessment method was developed. These method was developed to prevent work-related musculoskeletal disorders or WMSDs among the workers. Although there is variety of methods was available to identify the present of WMSDs but the accuracy of the measurements is based on the methods applications and limitations. Due to the complexity of factors such as inhomogeneity of the working activities, the sophisticated of measurement process, the diversity of cultures, incapable to accesses various body posture, and others problem that remain unsolved, the evolution of ergonomics risk assessment methods was never ended. To react with the demanding related with the WMSDs problems, ergonomics risk assessment methods become more advance in technologies. Parallel with the upcoming challenges of industry revolution 4.0, ergonomics risk assessment methods need to be transformed and adapted with the advance technology-based methods. The industries already to step ahead and starting to represent their production activities using robotics technologies, artificial intelligence (AI), biotechnology, and super-computer technologies. Therefore, ergonomics committee and practitioner should realize the opportunities and developed new ergonomics risk assessment method that integrated with the technologies. They need to be more accessible, understood, visionary, and modernize. The evolution of ergonomics risk assessment methods must be continuing and not rely with the traditional approach only

3

Title:
The Influence of Demographic Factors and Customer Traits on Intention to Use Self-Service Checkout at Tesco Tebrau

Journal:
International Journal of Interactive Mobile Technologies, Volume 16, Issue 13, 2022.

Document Type:
Article

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Abstract:
This research paper emphasizes the relationship between certain variables that influence the consumer's intention to use Self-Service Technologies (SST) in the retail sector. With the rapid growth of technology, various technological innovations are being introduced to make it easier for people to satisfy their needs and wants. One of the technologies that are very popular among customers is self-service checkout. However, previous studies on investigating the SST mainly focus on the technology adoption perspective and only a few studies have attempted to report from the consumer behavior perspective. As such, this paper aims to investigate the relationship between the customer's traits (technology anxiety, need for interaction, technology innovativeness, and demographics) towards the consumer intention to use SST. Two hundred answers were collected randomly among the Tesco customer in Malaysia. The data were then analyzed using SmartPls version 3 to validate the developed hypothesis which forms the foundation for the research model. The finding revealed that only technology anxiety, technology innovativeness, and demographics affect the consumer intention to use SST. The findings are important to the retailer to continue improving the current system in addressing 1. potential user (demographic), system complexity and safety (technology anxiety), and system features-interactive system (technology innovativeness) to give a different experience to the user as compared to traditional practice.

4

Title:
A Nonlinear Autoregressive Exogenous Neural Network (NARX) Model for the Prediction of the pH Neutralization Process for Palm Oil Mill Effluent

Journal:
Lecture Notes in Electrical Engineering, Volume 921 LNEE, 2022, Pages 520-531

Document Type:
Conference Paper

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Abstract:
This paper introduces a Nonlinear Autoregressive Exogenous Neural Network (NARX) to predict the pH value of the Palm Oil Mill Effluent (POME). NARX is a computing tool that is widely used for nonlinear time series problems, the techniques that can predict efficient and good performance. In this paper, the pH neutralization process is a MISO (Multiple Input Single Output) systems, the inputs of which are the dosing stroke rates of acid and base, and the output value is the pH value. The neural network was built and trained using the experimental data collected in an open-loop test. The neural network structure for modeling the pH neutralization was identified and the training and validation of the neural network structure were analyzed. The result showed that the NARX modeling was able to predict the pH based on the acid and base dosing stroke rate with an overall regression of 0.9934 and MSE values of 0.000924197.

5

Title:
Application Of Fuzzy Logic in Mobile Robots With Arduino and IoT

Journal:
Proceedings - 2022 7th International Conference on Automation, Control and Robotics Engineering, CACRE 2022

Document Type:
Conference Proceeding

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Abstract:
Mobile robot technology has advanced rapidly and can be used in a variety of industries due to its capacity to accomplish certain duties quickly and productively. Deep sea exploration, outer space adventure, military, surveillance, disaster environment, scouting, petroleum operations, advanced robotics, and manufacturing all have a high demand for mobile robots. The purpose of this project is to build a mobile robot that can automatically move from one location to another. AIOR:21 and LFR:21 are two types of multifunction robots that have been developed. To function properly, this robot must be equipped with smart technology, and modifications are required on a regular basis. In the suggested robot system, fuzzy logic control is employed to assess and process the operator's voice commands more accurately and effectively. The proposed robot is equipped with an Arduino Uno microcontroller, L298N motor driver, SG90 DC motor, HC-05 Bluetooth module, ultrasonic sensor, and 4-channel infrared remote relays. Furthermore, line tracking robot technology is used as a guide for automated moving robots. Wireless communication and robot monitoring can be accomplished with IoT via cellphones. With this function, the operator can remotely watch the robot's behavior, and all sensor data can be stored in the internet cloud storage. Several experiments have been conducted to assess the capacity of the robots to identify lines and avoid colliding with objects. The limits of this project are also discussed in the concluding section for the researchers to consider for future improvement. © 2022 IEEE.

6

Title:
Assessing Hospital Management Performance in Intensive Care Units (ICUs) During the COVID-19: A Study from the Pandemic Outbreak Perspective

Journal:
International journal of online and biomedical engineering

Document Type:
Article

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Abstract:
In the early stages of the pandemic, both poor and developed nations lacked healthcare infrastructure capacity. ICUs had more patients than ordinary wards, and hospital resources for patients were minimal. The possibility of contamination and infection, as well as restricted resources, pose challenges to ICU staff. The circumstance posed a significant difficulty for ICU management to protect healthcare staff while providing healthcare services to patients. Similarly, technology participation in prevention and dissemination control was limited both within and outside of ICUs treating infected patients. The current study investigated the hospital management performance in intensive care units (ICUs) during the COVID-19. We used the PRISM statement 2020 to include and exclude the records in the study. In addition, the study used the VOS viewer software to identify key term occurrences and classification of literature. The major three categories find COVID-19, ICUs and performance management. The current study findings indicate that healthcare personnel such as physicians, nurses, and other support staff made significant contributions during the peak period of pandemic transmission. Nurses are the closest to the infected patients within the ICUs, and the findings show that a considerable percentage of nurses have been infected with the COVID-19 virus (Kramer et al., 2021). Aside from this, in ICUs, technology engagement and infrastructure are substantially lower than in pandemic control and management. Future pandemic damage control and minimising the strain on healthcare workers require advanced technologies and performance management mechanisms. Furthermore, AI and robotic technology can be utilised to address this challenge. © 2022. International journal of online and biomedical engineering.

7

Title:
Casson Fluid Convective Flow in an Accelerated Microchannel with Thermal Radiation using the Caputo

Journal:
CFD Letters, Volume 14, Issue 8, August 2022, Pages 12-19

Document Type:
Article

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Abstract:
The effect of the Caputo fractional derivative in unsteady boundary layer Casson fluid flow in an accelerated microchannel is investigated. In the presence of thermal radiation, the partial differential equations that governed the problem are studied. Using appropriate dimensionless variables, fractional partial differential equations are translated into dimensionless governing equations. The equations are then transformed into linear ordinary differential equations and solved analytically using the Laplace transform technique. These modified equations are then solved using the proper method, and the result is obtained in the form of velocity and temperature profiles using the Zakian's explicit formula approach. The influence of essential physical parameters on velocity and temperature profiles is investigated using graphical diagrams created with Mathcad software. It is found that the velocity and temperature profile increase as fractional parameter, and thermal radiation parameter increase. As Prandtl number increase, both profiles are decreasing. This result is crucial for understanding the fractional system of Casson fluid in microchannel.

8

Title:
DEEPFAKE Image Synthesis for Data Augmentation

Journal:
IEEE Access, Volume 10, 2022, Pages 80847-80857

Document Type:
Article

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Abstract:
Field of medical imaging is scarce in terms of a dataset that is reliable and extensive enough to train distinct supervised deep learning models. One way to tackle this problem is to use a Generative Adversarial Network to synthesize DEEPFAKE images to augment the data. DEEPFAKE refers to the transfer of important features from the source image (or video) to the target image (or video), such that the target modality appears to animate the source almost close to reality. In the past decade, medical image processing has made significant advances using the latest state-of-art-methods of deep learning techniques. Supervised deep learning models produce super-human results with the help of huge amount of dataset in a variety of medical image processing and deep learning applications. DEEPFAKE images can be a useful in various applications like translating to different useful and sometimes malicious modalities, unbalanced datasets or increasing the amount of datasets. In this paper the data scarcity has been addressed by using Progressive Growing Generative Adversarial Networks (PGGAN). However, PGGAN consists of convolution layer that suffers from the training-related issues. PGGAN requires a large number of convolution layers in order to obtain high-resolution image training, which makes training a difficult task. In this work, a subjective self-attention layer has been added before 256 × 256 convolution layer for efficient feature learning and the use of spectral normalization in the discriminator and pixel normalization in the generator for training stabilization - the two tasks resulting into what is referred to as Enhanced-GAN. The performance of Enhanced-GAN is compared to PGGAN performance using the parameters of AM Score and Mode Score. In addition, the strength of Enhanced-GAN and PGGAN synthesized data is evaluated using the U-net supervised deep learning model for segmentation tasks. Dice Coefficient metrics show that U-net trained on Enhanced-GAN DEEPFAKE data optimized with real data performs better than PGGAN DEEPFAKE data with real data.

9

Title:
Breast Cancer Prediction Using Artificial Neural Networks Back Propagation Method

Journal:
Journal of Physics: Conference Series

Document Type:
Conference Paper

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Abstract:
Research on breast cancer has been widely conducted and previously studied with various methods or algorithms to categorize it into benign and malignant groups. In ANN algorithm, one method called back propagation network is utilized to solve complex problems related to identification, pattern recognition prediction, and so forth. The objective of the present study is to investigate the level of accuracy and performance by ANN back propagation in predicting breast cancer. Several stages for this study are formulating the problem, collecting and processing the Wisconsin breast cancer dataset from the Kaggle site. Designing and creating an ANN algorithm system to classify cancer into malignant and benign, then examining the system to perceive the prediction accuracy, and conclude it. The results of the numerical simulation indicate that the created system of MATLAB R2016a software obtained an accuracy of 96.929% with an error of 3.071% by a combination of training parameters with epoch 1000, learning rate 0.01, goal 0.001, and hidden layer 5.

10

Title:
Deep Learning Approach for Prediction of Brain Tumor from Small Number of MRI Images

Journal:
International Journal on Informatics Visualization, Volume 6, Issue 2-2, 2022, Pages 581-586

Document Type:
Article

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Abstract:
Daily, the computer industry has been moving towards machine intelligence. Deep learning is a subfield of artificial intelligence (AI)'s machine learning (ML). It has AI features that mimic the functioning of the human brain in analyzing data and generating patterns for making decisions. Deep learning is gaining much attention nowadays because of its superior precision when trained with large data. This study uses the deep learning approach to predict brain tumors from medical images of magnetic resonance imaging (MRI). This study is conducted based on CRISP-DM methodology using three deep learning algorithms: VGG-16, Inception V3, MobileNet V2, and implemented by the Python platform. The algorithms predict a small number of MRI medical images since the dataset has only 98 image samples of benign and 155 image samples of malignant brain tumors. Subsequently, the main objective of this work is to identify the best deep learning algorithm that performs on small-sized datasets. The performance evaluation results are based on the confusion matrix criteria, accuracy, precision, and recall, among others. Generally, the classification results of the MobileNet-V2 tend to be higher than the other models since its recall value is 86.00%. For Inception-V3, it got the second highest accuracy, 84.00%, and the lowest accuracy is VGG-16 since it got 79.00%. Thus, in this work, we show that DL technology in the medical field can be more advanced and easier to predict brain tumors, even with a small dataset.

11

Title:
Effect of dual-functional coating of chicken fillet with pectin-curcumin-lemongrass oil emulsion on the shelf-life stability and fat uptake during frying

Journal:
Acta Alimentaria, Volume 51, Issue 3, 30 September 2022, Pages 448-457

Document Type:
Article

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Abstract:
This study aims to formulate the optimal pectin-curcumin-lemongrass oil emulsion (PE) for coating of chicken fillet at 50:50%, 70:30%, and 90:10%, based on microbial growth inhibition, freshness consistency, and fat absorption during frying. Throughout the 7 days of storage, chicken fillet coated with 70:30% PE showed significant ($P < 0.05$) suppressive activity against psychrophilic bacteria (8.09 ± 0.00 log10 CFU g-1) compared to non-coated sample (8.27 ± 0.06 log10 CFU g-1). In contrast, 90:10% PE coating inhibited the growth of yeasts or moulds on chicken fillet at 8.24 ± 0.28 log10 CFU g-1, compared to non-coated sample (9.16 ± 0.14 log10 CFU g-1). The 70:30% PE coating showed a better fillet's toughness (18.30 ± 1.32 N mm-1 s-1) and firmness (1.49 ± 0.22 N mm-1) when compared to fillet without coating. After 7 days of storage, coated and uncoated samples showed the same total colour difference (E value) indicating PE coating preserved the texture of fillet and colour. Both coated samples (70:30% and 90:10%) reduced fat uptake during frying by 13.70%-14.25%. The application of PE coating at 90:10% was effectively functioned as an excellent coating to preserve the quality and safety of fillet.

12

Title:
Effects of drilling parameters on delamination of kenaf-glass fibre reinforced unsaturated polyester composites

Journal:
Journal of Industrial Textiles, Volume 51, Issue 2_suppl, June 2022, Pages 3057S-3076S

Document Type:
Article

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Abstract:
Drilling is a secondary material removal and usually carried out to facilitate fastening of parts together. Drilling of composite materials is not usually a problem-free process. Issues related to delamination composite laminates need to be addressed because it introduces the stress concentration point on the composite. This study focussed on the influence of process parameters such as spindle speed, feed rate, type of drill bits and geometry on the extend of delamination experienced by the composite during the drilling process of kenaf-glass fibre-reinforced unsaturated polyester composite, and the delamination measurements were taken under a microscope. Taguchi methods and analysis of variance were employed to find the optimal parameters. From the results, the most significant parameter was the feed rate. The minimum delamination was achieved when the feed rate was 0.05 mm/rev and spindle speed was 700r/min using both types of drill bits. The quality of the drill hole using the twist drill bit has been proven to be better than the brad drill bit.

13

Title:
Thermal radiation effect on Viscoelastic Walters'-B nanofluid flow through a circular cylinder in convective and constant heat flux

Journal:
Case Studies in Thermal Engineering, Volume 39, November 2022, Article number 102394

Document Type:
Article

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Abstract:
The investigation on flow of nanofluid are well known amongst researchers due to its utilization in the industrial and engineering sector. It is useful for cooling purposes in the electronic devices, which has shown good results in energy saving. Thus, this study focusses on the analysis of radiation effects on mixed convection of Walters'-B nanofluid flow through a circular cylinder in the constant heat flux (CHF) and convective boundary conditions (CBC) horizontally. The sodium carboxymethyl cellulose (CMC-water) nanofluid is considered as conventional fluid containing copper nanoparticles. The numerical method of Keller-box is conducted to simplify the partial differential equations. Graphical profiles are plotted and discussed to examine the impacts of various physicals terms on velocity, skin friction, temperature and thermal transfer. The results discover the fluid velocity and temperature boost for increasing radiation and Biot number caused by the raise of energy supply in the fluid flow. The velocity profile decreases when nanoparticles volume fraction increases as the increment of fluid concentration slowing down the fluid flow. The convective heat transfers and skin friction increases as mixed convection parameter rises by varying the thermal boundary region. Furthermore, the temperature and velocity in CHF condition are comparatively higher than CBC condition.