

Lecture Notes in Electrical Engineering 957

Shreesha Chokkadi
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Smart Sensors Measurement and Instrumentation

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Secure Image Classification Using Deep Learning

[K. Gururaj](#), [Alaka Ananith](#) & [Sachin S. Bhat](#)

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Abstract

Machine learning and security are the buzzwords these days. Just like other fields, privacy concern is a major issue in machine learning systems as well. Current privacy techniques focus on allowing multiple input parties to collaboratively train machine learning models without releasing their private data in its original form. One of the most sensitive data in this regard is medical images. Usage of such data for collectively training models might be against the policies of hospitals, which assure patients that their information would be kept confidential. In such a scenario, privacy preserving machine learning poses several advantages over the conventional methods. In this paper, we have implemented a secure machine learning model

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An SVM-Based Approach for the Quality Estimation of Udupi Jasmine

[Sachin S. Bhat](#) , [Nagaraja](#), [Suraj Revankar](#), [B. Chethan Kumar](#) & [Dinesha](#)

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Abstract

Udupi Jasmine is one of the four GI-tagged flower varieties of Karnataka state. Karnataka is the second largest producer of jasmine flowers in India. One major issue in jasmine cultivation is maintaining the quality of flowers. It is estimated that the labor cost for plucking and segregating the flower contributes 28% of the overall establishment cost. This work focuses to reduce the labor time involved in process of partitioning the jasmine flowers into normal and defected based on their quality. Automated jasmine classification makes use of image processing and machine learning methods for flower quality estimation. The acquired jasmine image is preprocessed, segmented and three different types of features are extracted. These feature vectors are normalized and fused to form one single feature vector for about 500 images in the dataset. The jasmine flowers are classified with a novel Convex-Hull and

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Abstract

Enormous amount of diversified plant species are available in India. Recognition and classification of these species have become a major challenge and an important research field. Though different parts of plants can be used in identifying their genre, leaf is most useful and effective method in classification. Machine learning brings an ideal way to automate this system. A separate dataset is built by collecting 20 different leaf samples available mainly in Southern India. More than 20,000 such samples are collected to build this dataset. Here, we used two different machine learning models namely support vector machine and binary convolutional neural network. These algorithms gave a promising results of 79% and 89.5%, respectively. Various analytical methods are used to evaluate the performance of these

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This book covers key areas of science and technology. The contributions by the authors include mechanical system; design faults, parametric accelerated life testing, cyclic loading, Goodman diagram, environmental information system, coal mines exploration, modern information and communication technologies, airborne scanner, aerial photography, waste management, carbon fabric; epoxy composites, neural network architecture, orthogonal array, rehabilitation robotics, locomotor difficulties, meteorology; spherical trigonometry, vector algebra; algorithms. This book contains various materials suitable for students, researchers and academicians in the field of science and technology.

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Taguchi and Neural Network Analysis for Predicting Abrasive Wear Behavior of Carbon Epoxy Composites

K. Sudarshan Rao

Recent Progress in Science and Technology Vol. 7, 15 March 2023, Page 42-60

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Abstract

In this study, an approach for predicting the three-body abrasive wear behavior of unfilled and graphite filled carbon fabric reinforced epoxy composite using two modeling techniques - Taguchi analysis and artificial neural network are presented. A set of experiments were conducted using an orthogonal array based on Taguchi techniques to acquire data in a controlled manner. The results showed that the addition of graphite particulate into carbon epoxy composite led to a decrease in its abrasive wear resistance, and the wear loss increased with an increase in abrading distance and loads. To investigate the effect of control parameters on the wear behavior of the composites, an analysis of variance was performed, and the S/N ratio was calculated. The results found that the normal load had the highest physical as well as statistical influence on the abrasive wear of the composites followed by abrading distance and filler content. To predict the wear properties of composites as a function of testing conditions, 3-[5]1-1 neural network architecture with Levenberg Marquardt (LM) training algorithm was used. By comparing the correlations obtained by Taguchi regression analysis and artificial neural network with the experimental results it was found that the artificial neural network predicts the wear rate better than regression analysis. Therefore, a well-trained artificial neural network system can be very helpful in estimating the weight loss in the complex three-body abrasive wear situation of polymer composites.

Keywords: Carbon fabric; epoxy; graphite filler; abrasive wear; Taguchi analysis; neural network


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Application to Aid Hearing and Speech Impaired People

Akshatha Patkar, Steve Martis, Anupriya, Rakshith & Deepthi G. Pai

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Abstract

One of the most priceless gifts to a natural being is the capability of vision, hear, express and react correspondingly to the situations. Interaction between deaf–dumb and ordinary beings is an inspiring mission. The hearing-impaired and the mute society depends mainly on the hand gestures known as the sign language for communication. The sign language identification is one of the revolutions for serving the specially-abled society. The exploration of identifying sign gestures is successful but involves an exclusive charge to be commercialized. For the sign language identification system to be used widely, the data acquisition process varies largely depending on the cost of the system, the methods used, limitations, etc. The course of learning, recognizing the signs and interacting via the ISL can be simplified by the proposed system that converts speech to the sequence of sign language symbols. Speech processing embraces speech recognition, the learning of identifying the vocabularies being vocalized,

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Influence of Burnishing Process on Tensile Strength of Al7075-T6 Alloy

[Pavana Kumara](#) & [Udaya Prasanna Handadi](#)

Conference paper | First Online: 03 August 2021

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Abstract

Burnishing is a finishing process that works on cold working principles and is performed on machined surfaces to smoothen the surface irregularities. The process results in improved surface finish, microhardness, resistance to wear and corrosion, fatigue life, and creep life. In the current work, the effect of ball burnishing process on the ultimate tensile strength (UTS) of Al7075-T6 alloy is analyzed using Taguchi method. The effect of four control factors, namely burnishing speed, burnishing feed, burnishing depth, and number of passes on the tensile strength, is studied by adopting L9 array; process parameters are optimized to fix the achievable maximum tensile strength for the said alloy. The results show that the burnishing process increased the tensile strength by 7% over the unburnished specimen.

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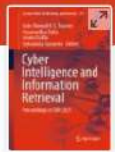
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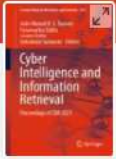
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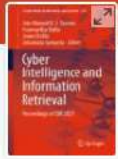
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Abstract

Magnetic resonance imaging is widely applied in medical practice. It has become a difficult task to divide the brain's image into distinct groups due to the symbiosis of intensity and noise. In recent years, due to the enhanced soft tissue contrast of non-invasive imaging and magnetic resonance imaging (MRI) images, MRI-based brain tumor segmentation studies are gaining more attention. With nearly two decades of development, innovative approaches to use computer-aided techniques to the field of brain tumors are becoming more mature and approaching common clinical applications. In order to enhance the segmentation performance of MRI brain images, fuzzy C-means (FCM) method based on similarity measurement is implemented in this paper. However, high computational requirements when working with big

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Abstract

Image classification and optical character recognition are important research areas in computer vision. With advancement in machine learning and deep learning techniques, these fields are attracting lot of researchers to develop models with near human perfection. Many character recognition models are available for modern languages. But, it is still a challenging task to analyze the handwritten text in Indian scripts. It is further complex for the scripts with large alpha syllabary and complex nature. This paper proposes a technique for the recognition and classification of ancient Tigalari characters from the handwritten text. Tigalari is widely used in coastal Karnataka and Kerala for documenting Sanskrit, Tulu, and Malayalam languages. Method involves the creation of database, design of deep convolution neural network (DCNN)-based architecture to classify the text, training the model with the data and

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Abstract

In a supermarket or a mall, people come to purchase products and during the time of payment, they need to calculate and know about the total bill which is hectic in nature. In order to overcome this problem, an application is created which keeps track of transaction history of both past and current billing records. This project is done to simplify shopping methods and reduce the long queue during the process of billing. In the previous models, authors have failed to make use of applications for shopping, also the previously proposed models had RFID scanner in every trolley for reducing the queues which was more expensive. So basically, there was no application created for shopping and an alternate way for scanning the products other than the RFID scanner was not introduced in malls. The methodology used here consists of a centralized system for the recommendation and online

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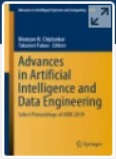
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Artificial Intelligence Techniques for Predicting Type 2 Diabetes

Ramyashree , [P. S. Venugopala](#), [Debmalya Barh](#) & [B. Ashwini](#)

Conference paper | First Online: 14 August 2020

1672 Accesses | 1 Citations

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Abstract

Diabetes is the most common disease experienced recently. Type 1 diabetes, type 2 diabetes, and gestational diabetes are the most common types of diabetes. The aim is to predict the type 2 diabetes with various parameters. "Diabetes risk score or test system" is designed with the various risk factors like age, waist circumference, physical activity, family history, and BMI using artificial intelligence technique and to design a universally acceptable diabetes prediction system that predicts the possibility of diabetes risk. This process is carried out using the various parameters of the patient's lifestyle and without using the data from medical test results. The individuals who are interested to know about their risk score can use this diabetes risk score system.

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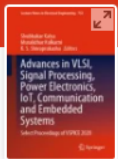
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Abstract

In this fast-phased world, the fashion industry is changing and tries to give confidence to people who wear their clothes. The fit of the garment depends on accuracy of measurements. The traditional method of measuring may provide wrong information if the tools are inappropriate. Even though 3D body scanning can give accurate results, they cannot be afforded by small business setups. 3D imaging makes the process expensive. Not all can afford a stylish to measure and stitch 4–5 sets of outfits and select the best. The working community has no time to visit stores/tailoring shops regularly. This paper proposes inexpensive method for extracting human body measurements from 2D images which helps the society to reach out to the different styles and fitted garments of their taste. Human body measurements are extracted with the help of—Affine and Metric correction, Green Screen Segmentation, Heuristics for detection and pixel-to-real world distance. It is a 2D-image-based system which

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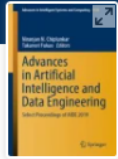
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Abstract

Handwriting classification and identification is one of the most interesting issues in the current research because of its variety of applications. It has leveraged its potential in reducing the manual work of converting the documents containing handwritten characters to machine-readable texts. The deep convolutional neural networks (DCNNs) are successfully implemented for the recognition of characters in various languages. This paper proposes a DCNN-based architecture for the classification of Tulu language characters. Tulu is one of the five Dravidian groups of languages used by around 50 Lakh people in the states of Karnataka and Kerala. This model is mainly developed to assist the character recognition of Tulu documents. A total of 90,000 characters including both vowels and consonants have been included in the dataset. This architecture is showing a satisfactory test accuracy of 92.41% for the classification of 45

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2019

Mg Magnesium Technology

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Development, Characterization, Mechanical and Corrosion Behaviour Investigation of Multi-direction Forged Mg–Zn Alloy

Gajanan Anne  [S. Ramesh](#), [Goutham Kumar](#), [Sandeep Sahu](#), [M. R. Ramesh](#), [H. Shivananda Nayaka](#) & [Shashibhushan Arya](#)

Conference paper | First Online: 14 February 2019

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Abstract

In the present study, homogenized Mg–4%Zn (wt%) alloy was exposed to multi-direction forging (MDF) at 280 °C up to 5 passes successfully. Microstructural evolution, mechanical properties and corrosion behavior of the MDF-processed Mg–4%Zn alloy was investigated using different characterization techniques. Five passes of MDF (cumulative strain, $\Sigma\Delta\epsilon = 3.45$) led to the formation of ultrafine grain structure (grain size $\sim 2.3 \mu\text{m}$) with high angle grain boundaries (HAGBs) and high dislocation density. Corresponding ultimate tensile strength (UTS) and microhardness were observed to be 228 MPa and 88 Hv. Potentiodynamic polarization test results exhibited higher corrosion resistance (0.38 mm/y) in comparison with

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Title: Effect of Rolling Reduction on Microstructure and Mechanical Properties Cu-3%Ti Alloy

Authors: Singh P.
Ramesh S.
Anne G.
Shivananda Nayaka H.

Issue Date: 2019

Citation: Lecture Notes In Mechanical Engineering, 2019, Vol., pp.167-175

Abstract: Cu-3%Ti alloy is cold rolled with different reduction ratios and the microstructures and mechanical properties are compared with that of as-cast Cu-3%Ti alloy. Microstructure was analyzed using optical microscope and scanning electron microscope. Optical microscopy revealed significant grain refinement that occurred during the rolling process. Tensile test results indicate that the UTS is increased by a significant amount up to 80% rolling reduction. A significant amount of tensile strength increased up to 812 MPa is about 1.69 times that of the cast Cu-3%Ti alloy. Hardness of the rolled Cu-3%Ti increased as % reduction increased. Dimples were revealed on the fracture surface of the rolled Cu-3%Ti specimens indicating a ductile nature of the fracture. © 2019, Springer Nature Singapore Pte Ltd.

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