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On behalf of the organizing committee, we are pleased to announce that the International Conference On Engineering Technology And Innovation is held on May 04-08, 2022 in Bosnia and Herzegovina (Hybrid Conference). ICETI 2022 provides an ideal academic platform for researchers to present the latest research findings and describe emerging technologies, and directions in Engineering Technology And Innovation. The conference seeks to contribute to presenting novel research results in all aspects of Engineering Technology And Innovation. The conference aims to bring together leading academic scientists, researchers and research scholars to exchange and share their experiences and research results about all aspects of Engineering Technology And Innovation. It also provides the premier interdisciplinary forum for scientists, engineers, and practitioners to present their latest research results, ideas, developments, and applications in al lareas of Engineering Technology And Innovation. The conference will bring together leading academic scientists, researchers and scholars in the domain of interest from around the world. ICETI 2021 is the oncoming event of the successful conference series focusing on Engineering Technology And Innovation. The International Conference on Engineering Technology and Innovation (ICETI 2022) aims to bring together leading academic scientists, researchers and research scholars to exchange and share their experiences and research results about all aspects of Engineering Technology and Innovation. It also provides the premier interdisciplinary forum for scientists, engineers, and practitioners to present their latest research results, ideas, developments, and applications in all areas of Engineering Technology and Innovation. The conference will bring together leading academic scientists, researchers and scholars in the domain of interest from around the world. The conference's goals are to provide a scientific forum for all international prestige scholars around the world and enable the interactive exchange of state-of-the-art knowledge. The conference will focus on evidence-based benefits proven in technology and innovation and engineering experiments.

Best regards,

Prof. Dr. Özer ÇINAR

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ENGINEERING TECHNOLOGY INNOVATION

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MICROSTRUCTURAL EVALUATION AND MECHANICAL PROPERTIES OF 0.75% VANADIUM-ALLOYED SPHEROIDAL GRAPHITE CAST IRON

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Abstract:

Spheroidal graphite cast irons (SGCIs) have been widely used in automotive and energy industries owing to their unique microstructures consisting of graphite nodules in ferritic, pearlitic, or ferritic/pearlitic matrices. Alloying elements can be added to improve the mechanical strength of the SGCIs by changing the amount, size, volume, and distribution of the microstructural components. In this study, GGG40, also known as EN-GJS-400-15, grade spheroidal graphite cast iron was alloyed with 0.75% vanadium in an induction furnace, and its microstructural evolution and mechanical properties were investigated compared to the unalloyed commercial alloy. Both unalloyed and 0.75% V-alloyed ductile iron specimens fabricated by sand mold casting were examined by a light optical microscope equipped with image analysis software, a universal tensile test machine, and a Brinell hardness tester. The alteration in the volume, nodularity, count, size, and distribution of graphite, and the alteration in the ferrite/pearlite ratio, hardness, and tensile test results were discussed as a function of V content.

Keywords: Spheroidal Graphite Cast Iron, Alloying; Vanadium, Microstructural Evolution

ADAPTIVE NEURO-FUZZY INFERENCE SYSTEM MODELS BASED PARTICLE SWARM OPTIMIZATION AND GENETIC ALGORITHMS FOR BIDIRECTIONAL DEEP DRAWING

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Abstract:

The adaptive neuro-fuzzy inference system modeling is an efficient tool for uncertain relationships and input parameters in multidimensional process problems. We applied this approach to the bidirectional deep drawing process in this work. Bidirectional deep drawing on servo screw presses is a manufacturing process for sheet metal forming. This process with freely programmable force and motion functions lead to innovative forming technologies for the deep drawing of sheet metals. The deep drawing process is usually complex and non-linear dynamics. Therefore determining ideal process parameters for deep drawing processes to control failures requires a broad understanding of the process and a challenge for the modeling as the basis of optimized process control. For instance, a Genetic Algorithm (GA) and a Particle Swarm Optimization (PSO) algorithm are used in an Adaptive Neuro-Fuzzy Inference System model to predict thickness and crack that may occur near the bottom of the part due to extreme thinning. Moreover, a database composed of 160 values was obtained using the finite element method (FEM) calculations for training and validating the ANFIS model with the different optimization approaches. This research has shown that the mean error (ME) for the ANFIS model after optimization with the PSO algorithm is 0.007, whereas ME after optimization with the GA algorithm is 0.017.

Keywords: Anfis, Evolutionary Optimization, Bidirectional Deep Drawing;

CLASSIFICATION OF ACUTE LYMPHOBLASTIC LEUKEMIA FROM PERIPHERAL BLOOD SMEAR IMAGES USING DEEP LEARNING ARCHITECTURES

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Abstract:

Acute Lymphoblastic Leukemia (ALL) is a type of cancer of the blood or bone marrow which is comprise of uncontrolled and excessive proliferation of lymphoblast abnormally. It is a common disease that threatens children aged 3-7 years and constitutes 80% of childhood leukemia's. It progresses rapidly and gets worse very quickly if not treated. In this context, the hematologists manually examine the white blood cells by a microscope, which is a time-consuming, laborious, tedious when workloads are excessive and can vary among inter and intra-observers. To overcome these difficulties, computer-aided diagnostic systems have been proposed during the past few years and still continue to be developed. Recently, deep learning methods widely have been started to use in medicine to diagnose the diseases. In this study, performances of five deep learning models for diagnosing ALL levels (benign, early malignant, pre-malignant and pro-malignant) using original peripheral blood smear images were analyzed. The ALL dataset used includes 504 benign, 985 early malignant, 963 pre-malignant and 804 pro-malignant images. The dataset was divided into 80%-20% (train-test) and classified by deep convolutional neural networks based on data augmentation and transfer learning models. The classification performances of DenseNet169, DenseNet201, InceptionResNetV2, InceptionV3 and Xception models for 30 epochs and batch size = 32 were compared. According to the experimental results of all models, an average accuracy performance of over 98.50% was obtained from each model. We found that average accuracy of DenseNet169 (99.70%) is higher than DenseNet201 (99.62%), InceptionResNetV2 (98.78%), InceptionV3 (98.54%) and Xception (99.24%). In this context, the classification performance of DenseNet169 model is 99.39% for benign and early malignant levels, and 100% for pre-malignant and pro-malignant levels.

Keywords: Acute Lymphoblastic Leukemia, Peripheral Blood Smear Images, Densenet169, Densenet201, Inceptionresnetv2, Inceptionv3, Xception

TREE PRUINING EQUIPMENT

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Abstract:

Around the power lines, tree pruning or cutting is done for the safety of the system. In Turkey, all trees that prevent the create an overhead line route or impair the security of existing lines must be pruned or cut, in accordance with the regulation on electric power current facilities of the supervisory institution, and the responsibility of this process belongs to the electricity distribution companies [1]. When all regulations and directives in Turkey are examined and considered the line lengths that electricity distribution companies are responsible for, it has become a necessity to develop the existing methods for tree cutting and pruning operations. These operations, which are carried out very close to the electricity transmission or distribution lines, should be carried out by creating an interruption in the power line in terms of occupational safety. However, most of the time, interruptions cannot be planned due to operational problems and requirements and field personnel have to work while there is power on the conductor line. There is a need for a new design in which the process can be carried out remotely to protect worker health and increase occupational safety measures by carrying out tree cutting and pruning operations in a safer way. In tree cutting and pruning processes, saw prototypes have been developed that can be easily mounted/disassembled on pick-up truck cranes currently used in electricity distribution companies and enable the cutting process to be done in the easiest way from within the vehicle.

Keywords: Energy Continuity, Occupational Health And Safety, Tree Cutting And Pruning

LASER-INDUCED CROSS-LINKING OF COLLAGEN/SERICIN-CAPPED GOLD NANOPARTICLE/ROSE BENGAL NANOCOMPOSITES

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Abstract:

Herein, the physicochemical characteristics of a nanocomposite structure composed of a lyophilized collagen sponge incorporated with sericin-capped gold nanoparticles (C-Au) were investigated for skin tissue engineering applications. The C-Au composites were photochemically cross-linked with a photosensitizing dye molecule rose bengal (RB) while irradiated with a green laser light (RBL treatment) to obtain the C-AuRBL group. While laser-induced cross-linking is widely applied in ophthalmology for various applications, such as corneal treatments and tissue photo-bonding, cross-linking of skin tissue scaffolds has not been studied before. After the scaffold fabrication with this novel strategy and investigating the aqueous stability, thermal degradation profile, the viscoelastic properties, and the suitability of the 3D porous architecture of the scaffold as a skin tissue scaffold, cell-scaffold interaction was investigated by seeding L929 fibroblasts and primary normal adult human epidermal keratinocytes (HEKa) into the scaffolds. The cytotoxicity of scaffolds in L929 fibroblasts was initially evaluated with MTT cell viability tests and light microscopy observations, then the morphology and spreading of cells were observed with scanning electron microscopy (SEM). The results are very encouraging since both S-AuNP and RBL could enhance significantly the aqueous and thermal stability of collagen-based scaffolds, and C-AuRBL supported the stimulation of L929 and HEKa cells adhesion and spreading, thus it could be proposed as a promising skin tissue scaffold.

Keywords: Collagen, Silk Sericin, Gold Nanoparticle, Rose Bengal, Skin Tissue Scaffold

EFFECT OF WATER-REDUCING ADMIXTURE MAIN CHAIN LENGTH CHANGE ON CONSISTENCY RETENTION PERFORMANCE OF MORTAR MIXTURES HAVING DIFFERENT C3A CONTENT

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Abstract:

Polycarboxylate-based water-reducing admixtures (PCE) consist of the main chain having carboxylic groups and comb-like side chains with polyethylene groups terminated by hydroxyl or methyl. The chain properties of PCEs are one of the most important parameters affecting their dispersing performance. In this study, the effect of the PCE main chain length variation on the admixture demand to provide the desired slump value (27±2 cm) and the consistency retention performance of mortar mixtures having different C3A content was investigated. For this purpose, a total of 12 mortar mixtures were prepared by using CEM I 42.5R type cement having four different C3A ratios (2%, 3%, 6%, 9%) and three different main chain lengths PCE (27000 g/mol, 55500 g/mol, 78000 g/mol). According to the results, irrespective of the PCE type, the PCE requirement increased by increment of the C3A ratio. It was determined that this behaviour was more pronounced in the mixture containing the cement having the highest C3A ratio (9%). The admixture requirement for desired slump value of PCE with having a short main chain and PCE with having a long main chain, were obtained 3.9-4.5 and 4.7-6.5 times higher than that of the PCE with having medium main chain length. It was attributed to the PCE having a short main chain resulting in a decrease in adsorption and electrostatic repulsion. For the PCE having long main chain, it may occur due to the bridging effect and the intertwining of the polymers. PCE having medium main chain showed almost %21 lower consistency retention performance than PCE having short and long main chain. This was attributed to the fact that the PCE having short and long main chain requirements for the target slump value were much higher than for the PCE having medium main chain.

Keywords: PCE, Main Chain Length, PCE Requirement, Consistency Retention Performance, C3a

EFFECT OF SHRINKAGE-REDUCING ADMIXTURE TYPE AND UTILIZATION RATE ON SHRINKAGE BEHAVIOR AND COMPRESSIVE STRENGTH OF MORTAR MIXTURES

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Abstract:

It is known that shrinkage behaviour is one of the most important parameters affecting the dimensional stability performance of cementitious systems. Nowadays, various methods are applied to prevent the shrinkage formation. It was found to be that the most common method is the addition of fiber and/or shrinkage-reducing admixtures (SRA) to the mixture. In this study, the effect of type and utilization rates of SRA on some fresh and hardened state properties of cementitious systems was investigated. For this purpose, a total of 10 mortar mixtures were prepared by adding hexylene glycol (HG)-, neopentyl glycol (NG)- and polypropylene glycol (PG)-based SRA to the control mixture at the ratios of 0.5%, 1% and 2% by weight of cement. CEM I 42.5R type cement and 0-4 mm crushed limestone aggregate were used. In all mixtures, the water/cement ratio and the slump value were kept constant as 0.38 and 220±20 mm, respectively. In order to provide the desired slump value, a polycarboxylate-ether based high-rate water reducing admixture (PCE) was used in different dosages. According to the results, irrespective of the SRA type, the flow performance and drying-shrinkage behavior of the mixtures were positively affected by the increment in the SRA utilization rate. In this context, while the mixture containing the NG showed the highest flowability performance, it was the weakest mixture in terms of drying-shrinkage behavior. It was understood that a similar shrinkage behavior was obtained in the mixtures containing the other two SRA types. Except for the mixture containing 0.5% PG, it was observed that the compressive strength value of the mixtures decreased with the presence of SRA in the systems. This behavior was more pronounced by increasing the SRA utilization rate. The mixture having PG exhibited the highest performance in terms of compressive strength among the mixtures containing SRA.

Keywords: Dimensional Stability, Shrinkage-Reducing Admixture, Slump Value, Compressive Strength

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