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ABSTRACT BOOK

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Conference Program

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		AI-Based Sales Prediction for Budget Management	Hıncal Topçuoğlu	15.03.2023	11:00-11:15
		Endemic Plant Classification Using Deep Neural Networks	Melih Öz	15.03.2023	11:15-11:30
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Artos	Assist. Prof. Dr. Mehmet Demirtaş	A Lossless Audio Encryption Method based on Chebyshev Map	Mehmet Demirtaş	15.03.2023	13:30-13:45
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Yerli Kalıp Ayırıcı PVA Üretilmesi

Fırat Konkur^{1*}, Oya Üsküp^{2*}

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Özet

Paker Yüzey Tasarımları-Belenco şirketi, üretim formülünde yaklaşık %90 oranında kuvars ve %10 oranında bağlayıcı madde kullanmaktadır. Bağlayıcı olarak stiren monomerli doymamış ortoftalik polyester reçine tercih edilmektedir. Kullanılan malzemeler belirli koşullarda bir araya getirilerek kuvars esaslı kompoze taş üretimi gerçekleştirilir. Üretim hattında kullanılan kauçuk kalıpların kürlenen plakalardan ayrılması için PVA kalıp ayırıcı film kullanılmaktadır. PVA, bir vinil grubu içeren suda çözünen, iyonik olmayan polimerler sınıfına ait sentetik bir polimer çeşididir. Suda çözünme özelliğinin yanı sıra, mükemmel film oluşturma özelliklerine, yüksek gerilme mukavemetine ve elastikiyetin yanı sıra organik çözücülere ve dağıtma gücüne karşı direnç özelliklerini barındırır. Üretim prosesinde de PVA filminin homojen oluşmasının yanı sıra kauçuk kalıptan ayrılıp taşın yüzeyine düzgün bir şekilde yapışması gerekir. Su ile çözünen formül sayesinde, kuvars esaslı kompoze taş ürünleri parlatma hattında kullanılan su ile tamamen yüzeyden ayrışır. Yapılan bu çalışmada, yapay taş sektöründe kullanılan su bazlı PVA kalıp ayırıcının maliyetini ve ithal girdiyi azaltmak için yerlileştirme yapılması amaçlanmıştır. Farklı oranlarda katkıları kullanılarak oluşturulan formüller ile pilot tesiste prototip çalışması gerçekleştirilmiştir. Prototip çalışmaları tamamlanıp nihai formül oluşturulduktan sonra elde edilen ürünün viskozitesi, yoğunluğu, katı madde miktarı, oluşturduğu film yapısı, taş üzerindeki davranışı ve taş yüzeyindeki yarattığı etki incelenmiştir. Yapılan çalışmalar sonucunda üretim hattında kullanılan PVA solüsyonuna benzer özelliklere sahip bir formül geliştirilmiştir. Elde edilen yerli PVA'nın 55°C'deki viskozite değeri 82 mPAS iken ithal olan PVA'nın

55⁰C'deki deęeri 78 mPAS olarak ölçülmüştür. Aynı şekilde 25⁰C'deki viskozite deęerleri de kıyaslandığında yerli PVA'nın viskozite deęeri 132 mPAS iken ithal PVA'nın da 118 mPAS olarak ölçülmüştür. Daha sonrasında katı madde miktarı tayini uygulanmıştır ve yerli PVA'nın % katı madde miktarı 17,92 iken ithal PVA'nunki ise 20,85 olarak bulunmuştur. Bu iki deęer arasındaki farkın, formülasyonda kullanılan su miktarları arasındaki farktan kaynaklanabileceęi tespit edilmiştir. İstenilen sonuca ulaşıldığında deneme üretimi yapılmış ve bu sektörde yerli bir kalıp ayırıcı kullanımına uygun ürün formülü geliştirilmiştir.

Anahtar: PVA, Kalıp Ayırıcı, Polimer, Kompoze Taş

Production of Local Mold Release PVA

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Abstract

Peker Yüzey Tasarımları-Belenco company uses approximately 90% quartz and 10% binder in its production formula. Unsaturated orthophthalic polyester resin with styrene monomer is preferred as binder. Quartz-based composite stone is produced by combining the materials used under certain conditions. PVA mold release film is used to separate the rubber molds used in the production line from the curing plates. PVA is a synthetic polymer variety that belongs to the class of water-soluble, nonionic polymers containing a vinyl group. Besides its water solubility, it boasts excellent film-forming properties, high tensile strength and elasticity, as well as resistance to organic solvents and dispersion power. In the production process, in addition to the homogeneous formation of the PVA film, the rubber must be separated from the mold and properly adhered to the surface of the stone. Thanks to the water-soluble formula, quartz-based composite stone products are completely separated from the surface by the water used in the polishing line. In this study, it is aimed to localize the water based PVA mold release agent used in the artificial stone industry to reduce the cost and import input. Prototype work was carried out in the pilot facility with the formulas created using additives in different proportions. After the prototype studies were completed and the final formula was created, the viscosity, density, amount of solid matter, the film structure it formed, its behaviour on the stone and the effect it created on the stone surface were examined. As a result of the studies, a formula with similar properties to the PVA solution used in the production line has been developed. While the viscosity value of the obtained domestic PVA at 55°C was 82 mPAS, the value of imported PVA at 55°C was measured as 78 mPAS. Likewise, when the viscosity values at 25°C are compared, the viscosity value of domestic PVA was 132 mPAS, while that of imported PVA was



measured as 118 mPAS. Then, the determination of the amount of solids was applied and the % solids content of domestic PVA was found to be 17.92, while that of imported PVA was found to be 20.85. It has been determined that the difference between these two values may be due to the difference in the amount of water used in the formulation. When the desired result was achieved, a trial production was made and a product formula suitable for the use of a local mold release agent was developed in this sector.

Keywords: PVA, Release Agent, Polymer, Composite Stone

Bağlantı Elemanı Tasarımında Dijital İkiz Kullanımı

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Özet

Soğuk dövme, plastik şekil verme temellerine dayanan ve bağlantı elemanlarının üretiminde kullanılan üretim yöntemlerinden biridir. Bu çalışmada, yaylı soğuk dövme kalıpları incelenerek dijital ikiz kullanımı ile tasarımda optimum yay özellikleri belirlenmiştir. Soğuk dövme işleminde malzemelere şekil verilebilmesi için biri hareketli diğeri ise sabit olmak üzere karşılıklı iki kalıp grubu bulunmaktadır. Bilgisayar destekli yazılımlar kullanılarak yapılan beş operasyonlu tasarımda, kafa ve uç bölgelerinde çift taraflı sıvama ve çift taraflı delik oluşturma işleminin yay kullanılarak gerçekleştirilmesi ilgili işlemin kısıtlayıcı unsurlarındandır. İlgili çalışmada, bu işlemler tek bir operasyon adımı içerisinde tasarlanarak, dijital ortamda üretilebilirlik çalışmaları yürütülmüştür. Bilgisayar destekli mühendislik programı olan ve sonlu elemanlar prensibine dayalı olarak çalışan Simufact Forming programı kullanılarak mekanik özellikleri farklı olan alternatif üç yay analizi yapılmış olup, kullanım yerine göre optimum özellikleri sağlayan yay parametreleri belirlenmiştir. Bilgisayar ortamında elde edilen simülasyon sonuçlar incelendiğinde, aynı tür yayların, karşılıklı kalıplarda kullanımının, sıvama işleminin homojen olarak gerçekleşmemesi sebebiyle uygun olmayacağı gözlemlenmiştir. Sonuç olarak daha fazla basma dayanımına maruz kalan sabit kalıpta 1S (80.3N/mm dayanım modülü) ve hareketli kafa grubunda ise 2S yay tasarımı (11N/mm dayanım modülü) seçimi yapılmıştır. Simülasyon sonuçları incelendiğinde, G50 WC-Co (Tungsten Karbür Kobalt) malzeme kullanılarak imal edilen yaylı sıvama kalıplarında oluşan gerilmelerin sırasıyla, kafa kalıbında 1.673 MPa ve ana kalıpta ise 1.811 MPa değerlerinde olduğu gözlemlenmiştir (G50 malzeme sertifikası %80 emniyet ile max. basma gerilmesi 3.100 MPa). Simülasyon destekli tasarım ve 3D tasarım çıktısının ölçüsel olarak %98 oranında benzerlik gösterdiği tespit edilmiştir. Anahtar: Soğuk Dövme, Dijital İkiz, Sonlu Elemanlar Yöntemi

Using Digital Twin in Fastener Design

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Abstract

Cold forging is one of the production methods used in the production of fasteners based on plastic forming techniques. In this study, spring cold forging dies were examined and optimum spring properties were aimed in the design with the use of digital twins. In order to forming the materials in the cold forging process, there are two opposing mold groups, one movable and fixed. In five operational designs obtained with computer aided software, it is one of the restrictive elements of the relevant process to perform double-sided plastering and doublesided hole forming in the head and end areas by using a spring. In the relevant study, these procedures were designed within in one operation step and the manufacturability studies was carried out in digital environment. Three alternative spring analysis with different mechanical properties was performed using the Simufact Forming, which is a computer aided engineering program based on finite element principle. Thus, the spring parameters that provide optimum properties were determined. When the simulation results obtained in the computer environment are examined, it was observed that the use of the same type of springs in reciprocal molds will not be appropriate due to the fact that the plastering process cannot be homogeneous. As a result, 1S spring design (80.3 N/mm strength modulus) for a fixed mold exposed to more compressive strength and the 2S spring design (11 N/mm strength modulus) for the moving head group. When the simulation results are examined, it is seen that the obtained stresses in spring plastering molds made of the G50 WC-CO materials (Tungsten Carbide Cobalt) are respectively 1.673 MPa in the movable dies and 1.811 MPa in the fixed dies. (When the G50 material certificate is examined, max. compressive stress is 3.100 MPa with 80% safety).It has been determined that the simulation aided design



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and 3D design outputs are 98% similar in terms of dimensions. Keywords: Cold Forging,
Digital Twin, FEM

Improving Marketing with Machine Learning: A Case Study of Google Analytics and CRM Integration

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Abstract

In today's digital age, businesses have access to vast amounts of customer data. By analyzing this data, businesses can gain insight into customer behavior and preferences. This also allows them to increase customer engagement. One approach to analyzing customer data is the integration of Google Analytics and CRM-based customer segmentation. Customers' actions on Tatilbudur website or mobile application are sent to Google Analytics as event data and stored as analytics data. Our own CRM software system contains previously collected customer data (either online or offline) that has been singularized. Customers have the option to provide their email addresses or phone numbers in certain input fields on our website or mobile application (e.g., login pages, checkout pages, newsletter sections, etc.). If a customer has provided their email address or phone number in these fields, data is sent to Google Analytics via an event. If Google Analytics has not previously matched the customer with our CRM system, it will inquire to determine whether the customer is already registered. By using hashed email addresses or phone numbers shared between the CRM and Google Analytics, the same customer is identified and synchronized.

In this study, the use of machine learning algorithms, specifically K-means clustering, is explored to further analyse our collected customer data and improve marketing efforts. Once customer clusters have been identified, businesses can target each group with



personalized marketing campaigns. In this paper, first, a data collection system was created, then a sample dataset collected. Finally, the K-means clustering algorithm for matched unique customers in the dataset was applied. Each cluster was characterized by unique customer behavior and preferences, which enabled targeted and personalized marketing campaigns. The results demonstrate the potential of machine learning algorithms to improve marketing efforts and customer engagement.

Keywords: Digital marketing, machine learning, customer segmentation, clustering

Elektrik Panolarında Ark Hatasını Tespit Edebilen Kesici Sistem Tasarımı

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Özet

Endüstriyel tesislerde kullanılan enerji dağıtım panolarında yüksek akım ve gerilime maruz kalan iletken ya da devre elemanları bulunmaktadır. Elektrik panolarında bulunan bu devre elemanları çeşitli sebeplerle zaman içerisinde aşırı akıma maruz kalabilmektedir. Böyle bir durumda aşırı akıma maruz kalan devre elemanı ark oluşturarak tehlikeli durumlar ortaya çıkarmaktadır. Bu çalışmada elektrik panolarında ortaya çıkan ark hatasını zararlı seviyeye ulaşmadan ortadan kaldıracak bir kesici sistem tasarlanmıştır. Tasarımın ilk aşaması olarak ışık şeklinde ortaya çıkan ark hatasını dijital bir sistemin algılayabileceği şekle dönüştüren optik ark algılayıcı modül tasarımı gerçekleştirilmiştir. Ardından optik algılayıcıdan gelen sinyalin ark hatası olup olmadığını hızlı bir şekilde analiz eden gömülü sistem yazılımı gerçekleştirilmiştir. Son olarak enerji sistemini kontrol eden kesiciyi aktif hale getirecek olan sürücü modülü tasarlanmıştır. Yapılan çalışma sonucunda optik algılayıcıdan algılanan ark hatasının gömülü sistem yazılımı vasıtasıyla hızlı bir şekilde tespit edilmiş ve kesiciye çok kısa bir sürede devreyi açma komutu gönderilmiştir. Ortaya konulan kesici sistem tasarımı ile yapılan testler sonucunda elektrik panolarında ortaya çıkabilecek ark hatasının zararlı seviyeye ulaşmadan ortadan kaldırıldığı görülmüştür.

Anahtar Kelimeler: Gömülü Sistem, Ark Hatası, Devre Kesici

Breaker System Design That Can Detect Arc Fault in Electrical Panels

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Abstract

There are conductors or circuit elements that are exposed to high current and voltage in the energy distribution panels used in industrial facilities. These circuit elements in electrical panels can be exposed to excessive current over time for various reasons. In such a case, the circuit element exposed to excessive current creates an arc and creates dangerous situations. In this study, a breaker system is designed to eliminate the arc fault that occurs in electrical panels before it reaches a harmful level. As the first stage of the design, the optical arc sensor module design was carried out, which transforms the arc fault, which appears in the form of light, into a form that a digital system can detect. Then, the embedded system software was implemented that quickly analyzes whether the signal coming from the optical sensor is arc fault or not. Finally, the driver module, which will activate the breaker that controls the energy system, is designed. As a result of the study, the arc fault detected by the optical sensor was quickly detected by the embedded system software and a command to open the circuit was sent to the breaker in a very short time. As a result of the tests made with the breaker system design, it has been seen that the arc fault that may occur in the electrical panels is eliminated before it reaches a harmful level.

Keywords: Embedded System, Arc Fault, Circuit Breaker

Mobilya Çekmecelerinde Kullanılan Ara Bölme Elemanlarının Delik Delme Sürecinin İyileştirilmesi için Makine Tasarımı

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Özet

Mobilyalarda, depolanan eşyalara kolay erişim sağlamak ve mobilyanın görünümüne estetik zenginlik katmak amacıyla çekmeceler kullanılmaktadır. Çekmeceler, mobilyanın tasarımına ve kullanım amacına yönelik olarak farklı ölçülerde üretilebilmektedir. Mobilya kullanıcıları, çekmece içinde depoladıkları eşyaların kategorize edilme işlemini kolay bir biçimde yapabilmek için çekmecelerin ara bölmeli olmasını tercih etmektedirler. Ara bölme olarak kullanılan elemanlar, çekmeceye monte edilebilmekte veya ayrı bir eleman olarak yerleştirilebilmektedir. Çekmeceye monte edilebilen ara bölme elemanlarında yaygın olarak kavelalı birleştirme tekniği kullanılmaktadır.

Çilek Mobilya A.Ş. tarafından üretilen mobilyalarda bulunan çekmeceler, ara bölme elemanlı veya ara bölme elemansız olarak üretilmektedir. Mobilya tipine göre, çekmecelerde kullanılan ara bölme elemanlarının uzunluk ölçüleri dolayısıyla da üretim sırasındaki delgi planları değişkenlik göstermektedir. Sadece kısa kenarlarında ikişer delik bulunan ara bölme elemanlarının delik işlemi bir hazırlık ve iki geçiş işlemi yapılarak gerçekleştirilmektedir. Kısa kenarlarında tek delik, uzun kenarında iki delik olan ara bölme elemanlarının delik işlemi ise iki hazırlık ve üç geçiş işlemi yapılarak gerçekleştirilmektedir. Ara bölme elemanlarının delik işlemleri üretim hattında sadece 3

kafa delik makinesinde yapılabilmektedir. Delik işlemlerindeki hazırlık ve işlem süreleri, operatörün yetkinliğine göre değişkenlik göstermektedir. Üretim süreci içerisinde farklı makinede işlem yapılamaması 3 kafa delik makinesinde darboğaz oluşturmakta ve makine önü gereksiz stok oluşmasına neden olmaktadır. Operatöre bağlı olan işlem ise üretim sürecini verimlilik ve ekonomi açısından olumsuz etkilemektedir.

Bu çalışmada, üretilen ara bölme elemanlarının delik işlemlerini bir hazırlık ve bir geçiş işlemi ile gerçekleştirmek suretiyle yapabilecek bir makine tasarlanması, geliştirilmesi ve bu sayede de üretim sürecinin iyileştirilmesi amaçlanmıştır. Bu maksatla, ara bölme elemanlarının kısa ve uzun kenarlarındaki delik işlemlerini tek seferde delebilecek bir makine tasarlanmış, geliştirilmiş ve Çilek Mobilya A.Ş. üretim sistemine adapte edilmiştir. Bu makineyle, makine önü bekleme tamamen ortadan kaldırılmış, hazırlık ve işlem süreleri azaltılarak parça ve işçilik maliyetleri azaltılmıştır.

Anahtar: mobilya, mobilya üretimi, çekmece ara bölme, delik makinesi, makine tasarımı

Machine Design to Improve the Hole Drilling Process of Divider Elements Used in Furniture Drawers

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Abstract

In furniture, drawers are used to provide easy access to stored items and to add aesthetic richness to the appearance of the furniture. Drawers can be produced in different sizes for the design and purpose of the furniture. Furniture users prefer to have drawers with divider in order to be able to easily categorize the items they store in the drawer. The elements used as the divider can be mounted in the drawer or placed as a separate element. Dowel jointing technique is commonly used in drawer-mounted partition elements.

The drawers in the furniture produced by Çilek Furniture are produced with or without a divider element. According to the type of furniture, the length dimensions of the divider elements used in drawers, and therefore the auger plans during production vary. Only two holes in the short sides of the divider elements with a preparation and two transition operations are performed. The hole operation of the intermediate divider elements, which have a single hole on the short sides and two holes on the long side, is carried out by making two preparations and three passes. Hole operations of the divider elements can be performed on only 3-head drilling machine in the production line. Preparation and processing times for hole operations vary depending on the competence of the operator. The inability to process in different machines during the production process creates a bottleneck in the 3-head drilling machine and causes unnecessary stocks in front



of the machine. The operation, which depends on the operator, negatively affects the production process in terms of efficiency and economy.

In this study, it is aimed to design and develop a machine that can perform the hole operations of the manufactured divider elements with a preparation and a transition process and thus improve the production process. For this purpose, a machine that can drill holes in the short and long sides of the divider elements in one go has been designed, developed and adapted to the Çilek Furniture production system. With this machine, machine waiting is completely eliminated, preparation and processing times are reduced, reducing parts and labor costs.

Keywords: furniture, furniture production, drawer divider, drilling machine, machine design

Üretim İşletmelerine Bilgi Temelli Yönetim İçin CoralReef IoT

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Özet

Günümüz teknolojisinin hızla gelişmesi ile birlikte insan yaşamının büyük bir kısmını internete bağlı olarak geçirmeye başlamıştır. Gelecek yıllarda şu an internete bağlı olmayan birçok nesnenin internete bağlanarak uzaktan kontrol edilebileceği aşikardır. Artan bu bağlılıkla birlikte günümüzde çeşitli sektörlerdeki birçok firma müşterilerine gelişmiş hizmetler sunmak ve global dünyada daha fazla yer edinmek için IoT'yi aktif bir şekilde kullanmaya başlamıştır.

Nesnelerin interneti olarak kullanılan tabir “Internet Of Things” (IoT), farklı nesnelerin internete bağlanması ve internet ağı üzerinden birbirleriyle etkileşime geçmesi olarak tanımlanabilir. Nesnelerin interneti, cihazların insan müdahalesine ihtiyaç duyulmadan birbirleri ile olan iletişimleri aracılığıyla bilgiyi ürettikleri, bu bilginin yardımıyla karar verebildikleri bir ağ yapısı olarak tanımlanmaktadır.

İnternete giderek daha fazla cihazın bağlanmasına yönelik talepler IoT uygulamaları için daha verimli ürünler geliştirmeyi günümüzün en sıcak konularından biri haline getirmiştir. Bu temelde oluşturulan projemizdeki amacımız, üretim sahalarında kullanılan makineler ile internet üzerinden haberleşmek, bunun için kendi ihtiyaçlarımıza özel tasarlanmış bir kart kullanmak, bu kart ile makinelerden istenilen üretime ait verilere arada işçilik gerektiren kablolu bağlantı ihtiyacı ve ekstra haberleşme protokolü sağlayacak donanımlara gereksinim kalmadan erişebilmek, sonrasında alınmış olan verileri işleyip, kurallar doğrultusunda yorumlayarak makine özelinde çıkarımlar oluşturmaktır.

IoT kartının tasarım sürecini kendi bünyemizde yaparak maliyetleri muadil IoT kartlarına oranla çok daha düşük seviyeye getirilmiştir. Aynı zamanda direk makine üzerine monte edilmesi hedeflenen bu kart sayesinde fabrika içerisinde makine yer değişimlerinden etkilenmeyecektir.

Kartın konfigürasyonu ve verilerin yorumlanması için üzerinde çalışılan yazılımlar aracılığıyla, istenilen kuralların oluşturulması için ihtiyaç oluşabilecek tecrübeli personele olan bağımlılıkları minimuma indirmek hedeflenmiştir.

Bu aşamada ilk olarak bir tasarımı firmamız tarafımızdan yapılmış IoT kartı hazırlanmıştır. IoT kartının genel özellikleri şu şekildedir:

1. 5-24V DC besleme geriliminde çalışmaktadır.
2. 4 DI/ 4 DO yapısına sahiptir.
3. 100kHz kadar çalışabilecek frekans aralığı mevcuttur.
4. Wifi ile kablosuz olarak veri alım işlemi mevcuttur.
5. MQTT protokolü ile haberleşme sağlamaktadır.

IoT kartının firmalarda kullanım süreci baştan sona şu şekilde olacaktır. IoT kartının giriş ve çıkış parametrelerine göre makinelerin yanına bu kartlar yerleştirilecektir. İlk aşamada IoT kartının haberleşme parametreleri düzenlenmelidir. Bu aşamada, IoT projesi doğrultusunda geliştirmesini yaptığımız CoralReef IOT yazılımı kullanılacaktır. Bu yazılım CoralReef IoT cihazını Web Server üzerinden konfigürasyonunun yapılması için kullanılan arayüz yazılımıdır. CoralReef IoT cihazının MQTT ayarları bu programdan yapılmaktadır.

MQTT ayarları bu program aracılığıyla yapıldıktan sonra, bir çok farklı protokolle iletişim kurarak cihazların verilerini database'e atılmasını sağlayan C# tabanlı bir yazılım olan NOSFC aracılığıyla, makine tanımları yapılacak, her makine özelinde üretim, duruş ve kalite kriter olarak verileri için adreslemeler yapılmaktadır. Bir veri toplama programı olan NOSFC aracılığıyla okunan veriler database üzerine tablolara aktarılmaktadır. Aynı zamanda fabrika içerisindeki veri alışverişine bağlı tüm yapı NOSFC bünyesinde yer alan

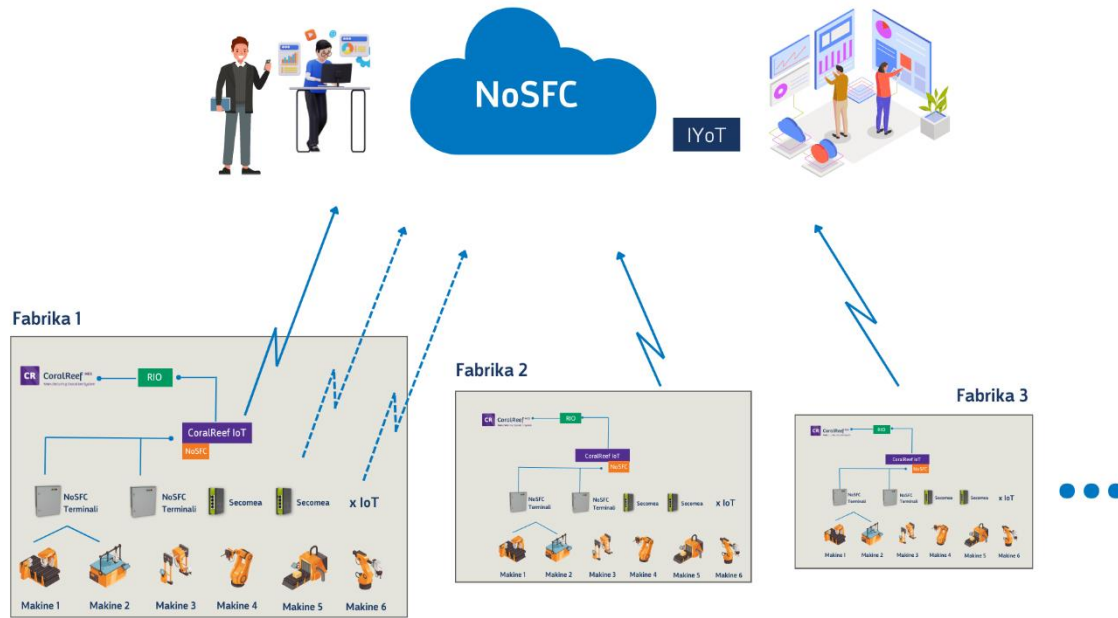
tool sayesinde excel dosyası olarak raporlanmaktadır. Böylelikle makine ve o makinelere bağlı veriler kolayca listelenebilmektedir.

Database'e aktarılan veriler bir sonraki aşamada anlamlandırılmak ve yorumlanmak için yine yazılımını firmamız bünyesinde geliştirdiğimiz "CoralReef IOT Kuralbase" yazılımı ile yorumlanmaktadır. Kullanıcı dostu olan "CoralReef IOT Kuralbase" yazılımı database'e aktarılan ham veriyi belirli kurallar aracılığıyla istenilen çıktıyı verecek şekilde başta belirtilen kurallar doğrultusunda ilerleyen bir programdır. İlgili program sadece IoT kart verilerini analiz ederek veri istifleme dışında herhangi bir database'e bağlanıp başka verileri de elde edip istenilen kurallar çerçevesinde istenilen database'e verilerini atabilecek hale getirilecek şekilde hazırlanmıştır.

IoT projesinin beraberinde getirdiği bir diğer yenilik mobil görselleştirmedir. Bu görselleştirme oluşturulan makine verilerinin mobil Android bir uygulama üzerinden takip edilmesini sağlamaktır. Bu aşamada mobil uygulama üzerinden fabrikada bulunmaya gerek kalmadan her makine için anlık takip yapılabilecektir. Makinenin üretim ve duruş süreçleri uzaktan izlenebilir durumda olacaktır.

Projenin gelişim gösteren ve hedeflenen sonucu ise alınan verilerden elde edilen çıkarımlar doğrultusunda yapay zeka için bir temel oluşturmak ve hali hazırda sektörde bir ihtiyaç haline gelen kestirimci bakım uygulamaları başta olmak üzere yapay zeka destekli uygulamalara zemin hazırlamaktır. Aynı zamanda makineler özelinde çıkarılacak analizler doğrultusunda verimlilik süreçleri ön plana alınacak, uzun vadede yüksek verimli çalışma planları oluşturulabilecektir. Karar verme süreçleri minimuma indirilerek daha az risk içeren faaliyetler planlanabilecektir.

Anahtar Kelimeler: IoT, MQTT, Haberleşme, Mobil, Veri Toplama



CoralReef IoT for Knowledge-Based Management to Manufacturing Businesses

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Abstract

With the rapid development of technology, people have started to spend a large part of their lives connected to the internet. It is obvious that in the coming years, many objects that are not currently connected to the internet will be controlled remotely by connecting to the internet. With this increasing commitment, many companies in various sectors have started to actively use IoT to provide advanced services to their customers and gain more space in the market.

The term "Internet of Things" (IoT) can be defined as different objects connecting to the internet and interacting with each other over the internet network. The Internet of Things is defined as a network structure in which devices produce information through their communications with each other without the need for human intervention and can make decisions with the help of this information.

The demands on connecting more and more devices to the internet have made developing more efficient products for IoT applications a crucial topic. The aim of our project is to communicate with the machines used in the production sites over the internet. We use a card specially designed for our own needs and access the data of the desired production from the machines with this card without the need for cabling that requires labor and the need for equipment that will provide extra communication protocol. We process the data received and create machine-specific information by interpreting it in accordance with the determined rules.

By making the design process of the IoT card in-house, the costs have considerably decreased in IoT cards equivalent. At the same time, thanks to this card, which is aimed to be mounted directly on the machine, the machine will not be affected by the displacements in the factory.

Through the configuration of the card and the software installed for the interpretation of the data, it is aimed to minimize dependencies on experienced personnel to create rules.

At this stage, a first IoT card was designed by our company. The general features of the IoT card are as follows:

It operates at 5-24V DC supply voltage.

It has 4 DI/ 4 DO structure.

There is a frequency range that can operate up to 100kHz.

Wireless data reception is available with Wifi.

It provides communication with MQTT protocol.

The process of using the IoT card in companies will be as followed. According to the input and output parameters of the IoT card, these cards will be placed next to the machines. CoralReef IoT software which we have developed in line with the IoT project will be used. This software is the interface software used to configure the CoralReef IoT device via Web Server. The MQTT settings of the CoralReef IoT device are made from this program.

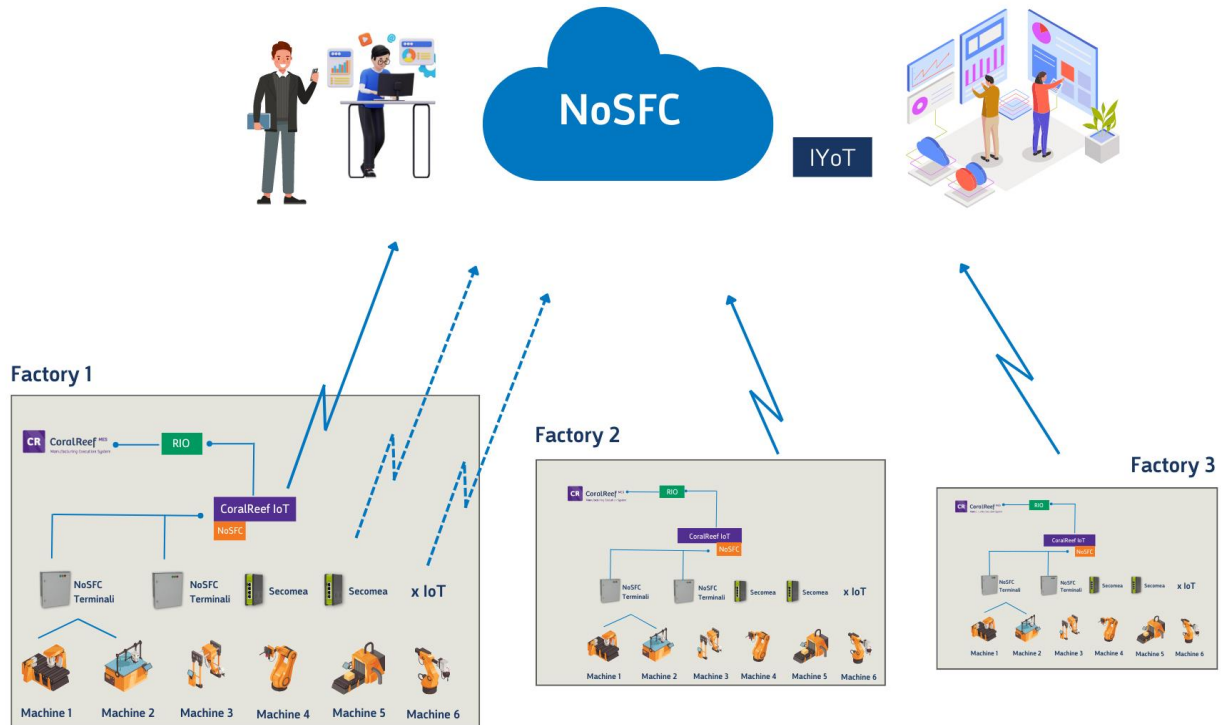
After the MQTT settings are made through this program, machine definitions will be made through NOSFC, a C#-based software that communicates with many different protocols and allows the devices to access the database. Posture and quality criteria are addressed to each machine. The data read through NOSFC, which is a data collection program, are transferred to tables on the database. At the same time, the whole structure connected to the data exchange in the factory is reported as an excel file through NOSFC. Thus, the machine and its related data can be easily listed.

The data transferred to the database are interpreted with the "CoralReef IOT Rulebase" software that we have developed. The user-friendly "CoralReef IoT Rulebase" software is a program that works in accordance with the rules specified at the beginning to give the desired output through certain rules. The other than stacking and analyzing IoT card data, the program can connect to any database and transfer its data to the desired database within the framework of the determined rules.

Another innovation brought about by the IoT project is mobile visualization. This visualization is to enable that the machine data being processed is tracked through an Android application. At this stage, instant follow-up can be made for each machine without the need to be in the factory via the mobile application. The production and downtime processes of the machine will be remotely monitored.

The developing and targeted result of the project is to create a basis for artificial intelligence in line with the information obtained from the data received and to prepare the ground for artificial intelligence-supported applications, especially predictive maintenance applications, which have already become a need in the sector. At the same time, productivity processes will be prioritized in line with the analyzes to be issued specifically for the machines, and high-efficiency work plans can be created in the long term. Decision-making processes will be minimized and activities with less risk will be planned.

Keywords: IoT, MQTT, Communication, Mobile, Data Collection



Toxic Effects of Graphene Oxide Nanoparticle on Blood Cell Culture

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Abstract

Graphene is a promising nanomaterial with applications in many fields, such as electronics, energy, and medicine. Graphene's exceptional physicochemical properties, especially thermal conductivity, electron mobility, high surface area, and mechanical strength, promise to develop new or advanced industry technologies. Research laboratories and companies produce graphene and derivative materials like graphene oxide (GrO). The widespread use and exposure of these nanomaterials can significantly threaten living organisms and human health. Toxicity data of GrO are still insufficient to determine its adverse effects on different living organisms. The increase in the application areas and use of GrO necessitates designing and implementing versatile and accurate toxicological screening methods to ensure safety. These nanomaterials can come into contact with many physiological barriers of the applicators, especially the respiratory systems, during production. Concerns about its potential toxicity to human health have been raised, particularly in its interaction with blood cells. This study treated human blood cell cultures prepared in vitro with GrO. Cell cultures were exposed to GrO at 0.05-1 µg/mL dose intervals and 24-48 hours. At the end of the exposure times, the effects of GrO on cell viability and cellular damage were compared with control groups with WST-1 and lactate dehydrogenase (LDH) assays. The study showed that graphene reduces cell viability, increases cell membrane damage, and can be toxic to human blood cells, especially at high doses and increased exposure times. In addition to safely using graphene-derived nanomaterials such as GrO in research and industrial environments, it



is crucial to develop destruction protocols. In vitro and in vivo studies in different cell cultures and experimental animal models are needed further to evaluate the possible toxic effects of these nanomaterials.

AI-Based Sales Prediction for Budget Management

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Abstract

Enuygun.com allows users to search, list and evaluate domestic and international flight tickets, bus tickets and tens of thousands of hotels in seconds. In the bus ticket sales business, Enuygun works with different providers to obtain intercity travel information. Budget management is done for each provider separately. By depositing a certain amount of fee into the accounts of the relevant providers, sales or reservation transactions can be carried out through that balance. In order to carry out this balance management process in a smarter way, we aim to predetermine the amount of sales to be made at a provider. If working with a balance close to the sales amount, the cash on hand will be more optimized and manageable.

In today's highly competitive business environment, it is essential to have accurate sales predictions to effectively manage budgets and make informed decisions. Predicting future sales can be a daunting task, especially when dealing with large datasets and complex variables. In this study, we used AI and time series analyze to predict sales and optimize budget management for each vendor.

After conducting analysis and training multiple AI models, we found that our time series predictions are promising. We compared our predictions with actual sales data and found that the margin of error are very low, indicating the effectiveness of our models. These results have significant implications for budget management and optimization, as accurate sales predictions can enable Enuygun to make informed decisions about how to allocate resources and manage cash flow. By using AI-based sales predictions, Enuygun can work more efficiently and



effectively with its vendors, improving its competitiveness in the market and ultimately driving revenue growth.

Keywords: Sales prediction, budget tracking, machine learning, time series analysis

π -Shaped Graphene Plasmonic Antenna

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Abstract

Surface plasmons are excited propagating electromagnetic waves at the interface between a metal and dielectric. Mid-to far-infrared (IR) spectral range, graphene shows plasmonic character. Thus, it can control, confine, and manipulate light through surface plasmon excitation. The collective oscillations of the electrons (or hole) gas in two-dimensional graphene sheets can produce guided electromagnetic waves with strong subwavelength confinement. In this work, we present π -shaped graphene plasmonic antenna supporting three independent resonances in the THz frequency range. The proposed graphene structure sits on a (silicon nitride) SiN substrate. The numerical analysis of the proposed structure has been done with finite-difference time-domain (FDTD) method (Lumerical Solutions Inc.). The optical response of graphene is determined by its conductivity. In Mid-IR range, graphene has metallic behavior, and the conductivity is determined through the Drude formula. The resonance modes are calculated by considering the Drude formula into the surface plasmon dispersion relation. The behavior of the resonance peaks is investigated by changing the structural parameters of the graphene antenna. The physical origin of these modes is shown by nearfield calculations. The effect of chemical potential, relaxation time, period, and length of antenna on the transmission spectrum is investigated. The proposed structure can be fabricated with electron beam lithography (EBL). However, we theoretically investigate the graphene plasmonic antenna. We observe that the behavior of the resonance peaks is strongly affected by these structural parameters. Due to the change in chemical potential, relaxation time, period, and length of antenna we can observe blue and red shifts in resonance peaks. The proposed antenna can be used as a frequency selective filter, sensor, absorber, etc.



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Keywords: Graphene, Plasmonic antenna, Multi-Band, Surface Plasmon

The Effect Of Technology On Construction Projects In Humanitarian sector

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Abstract

The "collection of cutting-edge equipment, machines, modifications, software, etc. employed during the construction phase of a project" is referred to as construction technology. The entire goal of construction technology is to enhance the sector, spur innovation and advancement, and boost productivity. Construction technology, also known as "con tech," is actually thought of as a separate category of technology. Manufacturing, medical, energy, transportation, agriculture, and construction are the main divisions of technology. Construction technology is a distinct category, demonstrating how vital and distinctive a sector it is. Humanitarian organizations often embark on (re)-construction projects after destructions caused by a natural disaster or due to humanitarian needs created by conflict. Therefore, the use of technology tools in construction projects for those affected by disasters and wars is necessary in particular because of their positive impact on the stages of the project and its performance and related matters such as the use of these tools to facilitate access to dangerous places for workers in this field and their impact on the speed of completion and the preservation of funds that are In fact, it could be a donation. In this research, we created a survey, the criteria of this survey based on PMBOK 7th edition standards. we selected a group of technology tools that we believe are currently available in the field of construction, we distributed the survey to a group of workers in the field of construction in particular who work in humanitarian organizations in separate regions such as Yemen, Ukraine, Iraq, Afghanistan, Bangladesh and Kenya, we hope to get a response ranging from 150-200 reviewers to study and analyze the impact of these tools on the project management lifecycle stages , and project performance domain.

Keywords: Technology Tools, Humanitarian Organizations, PMBOK, Survey

Determination and Numerical Analysis of Gunshot Residue in Digital Images by Image Processing Method

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Abstract

Computerized image processing is a method of classifying, analyzing, and recognize images or videos by using pattern recognition and deep learning methods. With the advancement of technology, computer vision methods are expected to be used in today's forensic sciences, particularly in the determination of gunshot residue (GSR) and numerical analysis. Because determining and analyzing GSR particles via image analysis is a difficult and time-consuming process. In this study, the detection and numerical analysis of GSR particles were performed using Computer Vision Method on digital images of GSR particles obtained by SEM method. It has been demonstrated that this new method can be used for GSR particles images.

Acknowledgment

This study was produced from the doctoral thesis entitled "ADLİ BİLİMLER AÇISINDAN ATIŞ ARTIKLARI ANALİZ TEKNİKLERİ VE KRİMİNAL UYGULAMALARI " prepared by İlker KARA in 2014 under the supervision of Prof. Dr. Mehmet KASAP.



Abstract of EJRND Paper

Investigating Induced Thermal Shock Stresses on Washing Machine Glass with Finite Element Analysis

Keywords:

Thermo-mechanical analysis finite element analysis thermal shock glass

Main Article Content

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Abstract

Glass has become an increasingly popular material in modern home appliances due to its sleek, aesthetic appearance and durability. Washing machine manufacturers have followed this trend, incorporating glass as a key component in their designs. However, glass door breakage failure is a common issue that can cause serious injuries and damage. Glass door failure can occur suddenly or gradually and can be caused by several factors, including thermal shock, impact, wear and tear, and manufacturing defects. Understanding the failure modes of washing machine glass doors is crucial for developing effective solutions to prevent glass door failure in washing machines. The most common failure of glass in washing machines is subjected to repeated thermal shocks due to the frequent fluctuations in temperature during the washing and drying cycles. This thermal stress can cause the glass to crack, leading to safety hazards and costly repairs for consumers.

The aim of this paper is to investigate the induced thermal shock stresses on washing machine glass and to propose potential solutions to mitigate the risk of glass breakage.

The study will be carried out through a combination of experimental data collecting and numerical simulations including washing cycle simulation and experimental test scenario. The numerical simulations will use finite element analysis to model the thermal stresses experienced by the glass during the washing and drying cycles.

This paper is organized as follows. At the first part, the study will provide a literature review of existing research on thermal shock in glass and its effects on washing machines. Secondly, it will present the methodology used in this study, including details on the numerical simulations and experimental testing. Third part, covers the presentation of the results of the study, including the stress profiles of the glass samples and the observed damage. Fourth part will discuss the implications of the results and propose potential solutions to mitigate the risk of glass breakage in washing machines. Final part will conclude the paper with a summary of the key findings and suggestions for future research.

Overall, this study seeks to contribute to the development of safer and more reliable washing machines, by shedding light on the thermal shock stresses experienced by the glass components and proposing solutions to mitigate the associated risks.

Maximizing Total Net Profit for Traveling Salesman Problem with Profits Using Metaheuristic Algorithms

Keywords:

Arc routing with profits Traveling salesman problem with profits Metaheuristic algorithms Simulated annealing Variable neighborhood search

Main Article Content

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Abstract

Travelling Salesman Problem with profits (TSPP) is a special case of the general Travelling Salesman Problem, all nodes must not be visited, but profit is collected from visited nodes. It is a well-known NP-hard combinatorial optimization problem in the literature. Because of the problem's complexity, exact methods cannot find the global optimum solution to this problem, so many heuristic and metaheuristic solution techniques are studied to find a feasible solution in a reasonable time. In this research, two different metaheuristic algorithms, Simulated Annealing with Many-moves and Variable Neighborhood Search, are proposed to solve the TSPP. Proposed algorithms are tested with three different problem instances and compared in terms of the efficiency of algorithms.

Fluid Dynamics Analysis in NDIR Gas Sensor Capsule Designed with Convergent Nozzles

Keywords:

Fluid dynamics analysis NDIR gas sensor convergent nozzles volumetric flow rate

Main Article Content

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Abstract

Non-dispersive infrared (NDIR) gas sensor capsules have holes for gas inlet-outlet. The volumetric flow rate of the target gas into the sensor capsule is a significant factor affecting the fast and accurate measurement of gas concentration. The structure and dimensions of the holes in the capsule affect the volumetric flow rate of the target gas. If cylindrical holes are preferred in sensor capsules, it is necessary to enlarge the hole diameter to increase the volumetric flow rate of the gas. However, enlarging the hole diameter in NDIR gas sensors increases IR rays exiting the sensor capsule. This energy loss reduces the light concentration reaching the detector and adversely affects sensor performance. One of the ways to increase the volumetric flow of gas passing through the barrier without enlarging the hole diameter is the use of a convergent nozzle structure. Convergent nozzles increase the gas inlet velocity by increasing the pressure difference between the inner and outer points of the barrier, thanks to their structure. In this study, fluid dynamics analysis was conducted in a sensor capsule with cylindrical holes of different diameters 1mm and 1.5 mm, and convergent nozzles of two different sizes 1.5 mm to 1mm and 2 mm to 1 mm. According to the results obtained, when 1.5 mm to 1 mm convergent nozzles are used, the gas's volumetric flow rate is approximately the



same as when using cylindrical holes with a diameter of 1.5 mm. Thus, the same result is obtained without increasing the hole area in the capsule by 2.25 times by using convergent nozzles, and additional IR rays are prevented from exiting the sensor capsule. Even higher volumetric flow rate values have been achieved using 2 mm to 1 mm convergent nozzles. With this study, the importance of the structure of the holes where the gas enters the capsule is emphasized for the fast and accurate operation of NDIR gas sensors.

Xen Hypervisor Network Management System

Keywords:

Network Xen Hypervisor Embedded Linux Android Automotive OS Wi-Fi Ethernet
Network Topology

Main Article Content

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Abstract

On embedded devices, network traffic management is crucial. One of the most fundamental criteria in projects on which embedded devices are created is connecting devices to one another. Additionally, sharing the internet connection, if there is one, has evolved into a need in today's world. In this project, two different operating systems are running by using hypervisor on the same board. The aim of this study is to connect two operating systems running on Xen Hypervisor using a virtual bridge and share the internet connection. An Embedded Linux distribution created with the Yocto project was run on the host domain (Domain-0 in Xen Hypervisor terminology), and Android Automotive OS was run on the guest domain (DomU in Xen Hypervisor terminology). A special topology has been designed for two virtual domains to communicate. Network management is handled by Embedded Linux, as Embedded Linux runs on Domain-0.



Moreover, some scripts have been developed on both domains to implement the designed topology. These scripts enable quick and automatic completion of the required actions. In conclusion, this study describes how to automatically establish a network that provides communication between two virtual domains on Xen Hypervisor running on embedded devices. This paper is applicable to any project, provided the Xen hypervisor framework is used. It offers a reliable and efficient solution to connection needs such as infotainment and cluster systems, especially in systems where communication and internet are becoming more widespread for embedded devices such as automotive.

Estimating Mobile Contactless Payment Systems Usage in Turkey Using Grey Prediction Model

Keywords:

Grey system theory grey prediction model mobile contactless payment systems

Main Article Content

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Abstract

Technological developments brought about by digitalization have made several innovations in many areas from economy to social life a part of our lives. The most important of these innovations was the electronicization of trade. Electronic commerce forced payment systems to change and differentiated them. The rapid development of the technology of mobile devices and the rapid spread of use also shaped the change in payment systems. Today we are talking about mobile payment systems. The change in payment systems also caused changes in physical credit cards, and contactless payment systems with credit cards became widespread. Mobile contactless payment systems have also started to be used through applications downloaded to mobile devices without the need for a physical credit card. After the convenience of contactless payment with credit card, many banks started to offer their customers the convenience of contactless payment by mobile phone.

In this study, the demand for the use of mobile contactless payment systems in Turkey was estimated using the grey prediction model for the coming years. In determining demand forecast, the grey prediction model, which is included in the grey system theory, which was first presented by Deng in 1982, was used. It is a model that is used to make high-precision predictions based on a small number of data and has achieved successful results in many areas. In this study, some of the data were used for estimation and some for analysis of estimation results. In this study, high sharpness results were obtained.

Investigation of the Rheological Properties of Asphalt Binders Modified with Nanomaterial

Keywords:

Modification nanosilica rheological properties

Main Article Content

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Abstract

This study examined the effects of the Aerosil 150 addition on the rheological characteristics of bituminous binders at various temperatures. In the study, a frequency sweep test was applied to determine the rheological properties of pure binders and binders with 2%, 4% and 6% Aerosil 150 additives. Unaged binders were subjected to the frequency sweep test using a Bohlin DSR rheometer at test temperatures ranging from 40°C to 80°C (increasing by 10°C). The results showed that adding Aerosil 150 additive to the pure binder raised the binder's complex modulus (G^*) values while decreasing the phase angle (δ) values. At 40 °C 0.1 Hz frequency, 2%, 4% and 6% Aerosil 150 doped binders gave G^* values 1.52, 2.02 and 3 times higher than pure binder, respectively. The same ratio is 1.31, 1.54 and 1.99 times at 5 Hz frequency and 1.28, 1.47 and 1.82 times at 10 Hz frequency. At the same temperature, as the frequency value increases, the binders' complex modulus values approach each other. When the phase angle values at 40°C were examined, the 2%, 4%, and 6% Aerosil 150 modified binders, when compared to pure binder at 0.1 Hz frequency, yielded 2.75°C, 5.56°C, and 9.17°C lower phase angle values, respectively. This decrease is 3.19, 5.04 and 7.33 °C at 5 Hz frequency and 3.09, 4.84 and 6.76 °C at 10 Hz frequency. This shows that at various frequencies, the modified binder behaves more adaptably than the pure binder. The fact that the binder has a low δ value against a high G^* value indicates that it will exhibit more flexible behavior. It was



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discovered as a result that Aeresil 150 modified binders performed better in terms of rheological qualities than pure binders.

Evaluation of different cotton types with analytical hierarchy process

Keywords:

Cotton Analytic Hierarchy Process Fiber Properties

Main Article Content

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Abstract

There are significant differences in terms of price formation between cotton growers and yarn producers. While cotton growers prioritize the average yield per hectare and ginning yield in price formation, yarn producers pay attention to properties such as fiber fineness, fiber length, tensile strength, etc. Therefore, even if a cotton grower produces a large amount of cotton per hectare, the monetary value may be lower. This study aimed to determine the most suitable type of cotton for optimal profitability and quality yarn production for both producers, using the Analytic Hierarchy Process (AHP) for decision-making. AHP is a method that analyzes decision-making processes in an analytical and hierarchical structure. AHP helps to determine the best selection by evaluating the factors of a decision, assessing their relationships and priorities. In this study, among the 13 cotton types registered by the Eastern Mediterranean Agricultural Research Institute, the most suitable cotton selection based on criteria such as fiber fineness, fiber length, tensile strength, average yield per hectare, and ginning yield was determined using AHP.

Full Efficient NVM Usage For MCU

Keywords:

NVM MCU

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Abstract

Non-volatile memory (NVM) is a type of computer memory that has the ability to retain stored data even when power is disconnected. Its significance is growing due to the increasing need for fast storage and access to large volumes of data. To maximize the potential of NVM, efficient usage is crucial, which involves optimizing data structures, reducing read and write operations, and minimizing data transfer between NVM-connected applications in areas where low latency and high throughput is essential, such as in-memory databases, high-performance computing, and real-time analytics. Improving NVM efficiency can also enhance the durability and reliability of stored data by reducing the frequency of writes, extending its lifespan, and minimizing the risk of data loss. The aim of this study is to achieve 100% NVM efficiency through software modules developed for Telematic Control Units, which is critical for optimizing reliability in automotive applications. Moreover, efficient use of NVM plays a vital role in the hardware supply chain, covering the various stages of creating, deploying, and



managing hardware components that use NVM. It is necessary to minimize waste, reduce costs, and improve the quality of manufactured products. Efficient use of NVM is crucial in optimizing the production and management of NVM-based hardware to minimize the number of discarded components, increase usable components produced, and reduce the need for rework. Therefore, the efficient use of NVM is vital for obtaining higher quality and cost-effective hardware components in the supply chain. The study describes the use of fully efficient NVM for Telematic Control Units, which provides a reliable and efficient solution, especially in addressing the supply problems experienced in hardware today.

Developing Sustainable Methods for Softener and Fixing Agent Application in HT Dyeing Machines

Keywords:

Environmental impact Sustainable production HT machine Textile Finishing Process

Main Article Content

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Abstract

Global warming, which is one of the problems brought by the increasing population day by day, and the rapid depletion of water resources have increased the restrictions on water use. Thus, more environmentally friendly and sustainable production processes are developed by producers and consumers. The number of studies carried out to

minimize the use of raw materials in textile dyehouses is increasing day by day. The high chemical load, waste water usage rate and energy cost resulting from pretreatment, dyeing and other processes vary according to the processes used in textile factories.

Our company aims to support environmentally friendly studies that contribute to the economy in production processes. While producing in the paint shop, energy, water, chemicals, etc. It also aims to use raw material resources sparingly. In this study, the efficiency studies carried out in HT dyeing and finishing processes in the dyehouse of our company were examined. By optimizing the post-processing performed in HT machines after dyeing, softener and fixator chemicals applied in HT machines were carried out by using double pads before drying in stenter machines after trials. Obtained results were compared with old methods. A sustainable new method has been developed without any color, fastness or touch difference between the old system and the new system.

With this new process study, our company's water, energy and chemical savings and the company's impact on the environment have been reduced, while time savings have been achieved by shortening the process time. In the test results, there was no problem in washing, color and rubbing fastness efficiency. No change was observed in the touch of the products after the application of the softener step with the impregnation method instead of shrinking. As a result of the study, while the water consumption was reduced by 20%, the process time was also reduced by 19%.

Hyperparameter Optimization in Convolutional Neural Networks for Maize Seed Classification

Keywords:

Hyperparameter optimization convolutional neural networks machine learning tree-structured parzen estimators

Main Article Content

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Abstract

Corn farming is of great importance for the continuity of our society. Because corn is a cheap and efficient food, especially for animal feeding. However, with the Doubled-haploid technique, the selection of the haploid seeds necessary for this job to be done efficiently creates a problem. Today, the selection of haploid seeds is usually done by trained technicians. With the development of machine learning methods, the parts expected from technicians can be made by machines. In this study, a new model architecture based on a convolutional neural network (CNN) was produced to perform the selection of haploid seeds and the hyperparameters of this model were optimized with the use of tree-structured parzen estimator algorithm. The newly produced model achieved a 94.66% validation score, higher than the VGG-19 model, which proved to be relatively efficient.

Development of Nystagmus Test and Measurement for Benign Paroxysmal Positional Vertigo

Keywords:

Bithermal Caloric Test BPPV ENG Nystagmus Vertigo

Main Article Content

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Abstract

Vertigo is the illusion of rotation occurring due to a problem or a set of problems in the balance system of the body, and it is the situation that objects or places around the patients are in a revolving position around themselves. In vertigo, which is examined under two main headings as central and peripheral, central vertigo can be caused by aneurysms, tumors, and brain vascular disruption caused by brain lesions, while peripheral vertigo can occur due to thyroid types and metabolic disorders. Benign paroxysmal positional vertigo, colloquially called 'crystal floating', is the most common type of peripheral vertigo and many diagnostic, exercise and treatment methods are used in case of BPPV. However, today, as a result of the increase in computer use, treatment interactions have increased significantly. In line with the software created in this study, a computer-based diagnosis system and measurement system of nystagmus movements due to BPPV were developed. The system consists of three parts: mechanical, software and hardware. Visual Studio c# software interface and connection control software were formed in accordance with the diagnostic methods obtained from the literature. Software panels prepared on the interface for bithermal caloric and other tests are opened and the

electronystagmography data prepared accordingly are graphed on Digilent Waveforms Analog Discovery. The performance of the BPPV test and measurement system were applied to the control group consisting of 10 healthy individuals. Dix-Hallpike, gaze, head rotation, optokinetic, pursuit tracking, bithermal caloric, Head Shaking and Saccadic tests were applied. As a result, the time for the preparation of the bithermal caloric test to 30-degree temperature value of the 3900 ml and 2600 ml was calculated as 4.00 ± 1.8 s and 3.67 ± 2.8 s. For 44-degree temperature value, they were -1.70 ± 2.75 s and -0.70 ± 3.09 s. Thus, it is seen that the developed system will enable the diagnosis of patients with BPPV to be determined in accordance with integrated visual stimuli in an accurate and ergonomic environment.

Poly(Lactic Acid) / Polyester Blends: Review of Current and Future Applications

Keywords:

PLA PLA/Polyester Blends Bio-based Polymers Petroleum-based Polymers

Main Article Content

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Abstract

Poly (lactic acid) (PLA) is a promising polymer with its value and potential due to its sustainability, low carbon footprint, and being a superior bio-based polymer compared to other bioplastics. Since it is also a compostable aliphatic polyester, has been frequently subjected to research.

Researchers have conducted studies on the compatibility of PLA, which is a bio-based, biodegradable, and compostable, renewable polymer, with traditional petrochemical-based polymers, especially polyesters such as polybutylene terephthalate (PBT), and polyethylene terephthalate (PET). It is highly important that applications of PLA/polyester blends will ensure that the materials developed are not only economically and sustainable but also can meet current and future appropriate needs. PLA-based materials have some disadvantages such as slow biodegradation rate, high cost, and low toughness, and to eliminate mentioned drawbacks generally blends are prepared with petroleum-based polymers.



In this review, information about the perspectives with studies for PLA/polyester blends; approaches to the subject, potential application areas, and contributions for the future were given.

A New Hybrid Software Testing Automation Framework

Keywords:

Software Engineering Software Testing Hybrid Test Environments

Main Article Content

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Abstract

Nowadays, with the development of software technologies in all areas of life, software testing, which is an indispensable need of the software life cycle, has become open to development and change. The replacement of manual testing of software products with test automation systems that minimise the human error margin provides the most important example of the transformation of testing processes into a dynamic structure.

This paper details a hybrid approach that utilizes tools such as Java, Maven, Test-NG, etc. used in a traditional test automation. The proposed hybrid approach is based on Java's "Write once, run anywhere" approach. First of all, all HTML elements used in web applications are determined and these elements are saved in a model called PageFactory. PageFactory is a Page object model concept that allows managing elements from a single file. These saved elements are transferred to the next layer, the Test Layer architecture, using the relevant methods in the Page Layer model, and the methods in this layer are



invoked and executed. This proposed hybrid approach provides reusability, easy maintenance, cost reduction, increased performance, better quality software products, ease of use and time savings.