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2nd International Conference on

Textile Engineering

Theme:

"AN EXPLORING INNOVATION AND RESEARCH ON TEXTILE ENGINEERING"

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Plenary Forum

Adapted Sportswear for Comfort Improvement of Athletes

Alexandra De Raeve
HOGENT University of Applied Science & Arts, Belgium

Abstract
Clothing comfort is a fundamental and universal need for athletes. Comfort is generally classified into three broad categories (a) aesthetic comfort (b) thermo-physiological comfort and (c) tactile comfort. Aesthetic comfort is based on psychological or subjective aspects such as personal preferences, habituation and fashion trends. On the other hand, thermo-physiological and tactile comfort are quantifiable. Thermo-physiological comfort relates to the ability of the garment to maintain the thermal and moisture balance of the human body. The garment must provide good insulation to supplement the air gap on the surface of the skin, the retention of water must be minimal and sweat should be quickly moved away from the skin and evaporated.Tactile comfort is related to the mechanical interaction between the garment and the human body and fabric characteristics such as drapability, anti-static behaviour, smoothness and friction will impart to the tactile comfort. The fabric has thus a great influence on the wear comfort of clothing, but garment construction parameters such as design and fit will contribute for over 50 % to the feeling of comfort experienced by the wearer.This paper will discuss several case-studies which demonstrate the importance of the design, the fit and the fabric finish on wear comfort. The studies involved improving the design and fit of unisuits for elite rowers involving temperature and moisture regulating fabrics and the design of cycling suits for handbikers. The results have shown that minor adaptations to the design and a fit which is well adjusted to the body shape of the wearer can have a major impact on the thermo-physiological and tactile comfort feeling of the wearer. On the other hand, the use of phase change materials had little effect on the skin temperature of the wearer which was in stark contrast with the use of moisture regulating fabrics that indeed largely effect moisture management of garments.

Biography
Alexandra De Raeve,head of research center FTILab+.
Holds a master's degree in textile engineering. She has coordinated over 25 projects in both national and international framework with various funding, has (co-)authored multiple publications and presented her research work in international conferences. She is head of FTILab+ and holds a lecturer position. She started her career in the textile industry in 1988 as product developer. In 1999 she started as a researcher and innovation expert for the textile industry at HOGENT University of Applied Sciences & Arts. She has vast experience in teaching, research and project management and has extensive expertise in the field of clothing comfort, smart textiles and textile processing. She is the founding member and president of the board of MoTIV, Flemish Knowledge and Innovation platform for the Fashion Industry, and NETFAS, the Network of the Universities of Applied Sciences for Textiles and Fashion.

Smart 3D Orthogonal Woven Composite

Abdel-Fattah Seyam
North Carolina State University, USA

Abstract

Premature failure in structures such as airplanes, bridges, buildings, highways and dams causes expensive loss in lives and resources. For this reasons, structure health monitoring (SHM) were developed to continuously monitor structure integrity to predict damage before it occurs. Most of current SHM systems use sensors that are incorporated to the structure surface. These SHM systems are subjected to environment conditions and could be damaged. Moreover, they are limited to the detection of the surface damage of parts and are not capable of sensing the interior structure's damage. There are numerous examples of structures that failed despite the periodic examination of the exterior. This prompted us to undertake research with goal to develop a smart composite from 3D orthogonal performs with polymeric optical fiber (POF) impeded inside. In 3D orthogonal perform, which is formed from three sets of orthogonal yarns, the optic fiber can be directly woven in the x- or y-direction. It is essential to reduce/avoid bending of optical fiber to prevent signal loss, which enable the construction of SHM with high sensitivity.Range of 3D woven structures with POF was woven at different layers of the structure before resin infusion. The structure damage after repeated impact was assessed by measuring the composite strength after impact. The POF signal loss due to impact was correlated to the strength loss to establish relationship that can be used to reveal critical damage. The results showed that the POF located in the top layer is the most sensitive to the damage and were damaged at low impact energy. The signal loss of the POF located in the middle and bottom layers showed a good correlation with the strength loss of the composite. While the POF located in the bottom exhibited the least sensitivity, the sensitivity increased with the number of impacts.

Biography

Abdel-Fattah Seyam established numerous research areas: Structural Mechanics of Woven Fabrics, Carding Dynamics, Needle punching Process and Products, Direct Garment Manufacturing using Meltblowing and Robotic Technologies, Smart Electrotextile Structures, Computer Simulation and Formation of Nonwovens using Electrostatic Field (electrospinning and flocking), Formation of Nanofibers, Applications of MEMS in Textiles, Static Generation/Dissipation on Polymeric and Textiles Surfaces, Modeling of the Hydro entanglement Process, Fiber Reinforced Composites from High Performance Fibers and Sustainable Biodegradable Natural Fibers and Resins, Protection of High Performance Fibers from UV, Jacquard Fabrics on Demand, Seamless Shaped Garments and Medical Textiles, Laminates for Airships, Non-stop Tying-in Process, and Formation and Structure of 3D Printed Fiber Reinforced Composites. The success of establishing this significant list of research areas is related to the effective leadership and academic coupled with industry experience of Dr. Seyam, recruiting excellent students, involving faculty and industry experts from several disciplines, and securing substantial research funds. Dr. Seyam has published numerous peer-reviewed journal and conference papers and presented extensively at international conferences, including keynote and invited talks. He authored two user-friendly computer software packages with extensive codes for manufacturing and engineering woven structures for the two of his former industry employers. He is co-inventor of six patents in the areas of cold weather systems, electrotextile structures, airship, and non-stop tying-in process.

Smart Textiles for Personalized Health Care

Jun Chen
University of California, Los Angeles

Abstract
There is nothing more personal than healthcare. Health care must move from its current reactive and disease-centric system to a personalized, predictive, preventative and participatory model with a focus on disease prevention and health promotion. As the world marches into the era of Internet of Things (IoT) and 5G wireless, technology renovation enables industry to offer a more individually tailored approach to healthcare with more successful health outcomes, higher quality and lower cost. However, empowering the utility of IoT enabled technologies for personalized health care is still significantly challenged by the shortage of cost-effective wearable biomedical devices to continuously provide real-time, patient-generated health data. Textiles have been concomitant and playing a vital role in the long history of human civilization. The textile forms endow biomedical devices with biocompatible, biodegradable, even bioabsorbable features, allowing them to serve as on-body healthcare platforms with incomparable wearing comfort. Merging biomedical devices and textiles becomes increasingly important owing to the growing trend of IoT. In this talk, I will introduce our current research on smart textiles for biomedical monitoring and personalized diagnosis, textile for therapy, and textile power generation as an energy solution for the future wearable medical devices.

Biography
Dr. Jun Chen is currently an assistant professor in the Department of Bioengineering at the University of California, Los Angeles. His research focuses on nanotechnology and bioelectronics for energy, sensing, and therapeuticapplications in the form of smart textiles, wearables, and body area networks. He has already published 2 books, 140 journal articles and 90 of them are as first/corresponding authors in Chemical Reviews, Nature Energy, Nature Electronics, Nature Sustainability, Nature Communications, Joule, Matter, and many others. His works were selected as Research Highlights by Nature and Science 6 times and covered by world mainstream mediafor over 1,000 times in total, including NPR, ABC, NBC, Reuters, CNN, The Wall Street Journal, Scientific American, and Newsweek. He also filed 14 US patents and licensed 1. Beyond research, he is currently an Associate Editor of Biosensors and Bioelectronics, and an Editorial Board Member of The Innovations, Advanced Fiber Materials, Nano-Micro Letters, Frontiers in Pharmacology, Frontiers in Chemistry, Textiles, Biosensors, and Smart Materials in Medicine. With a current h-index of 69, he was identified to be one of the world's most influential researchers in the field of Materials Science by the Web of Science Group.Dr. Chen is the recipient of the Highly Cited Researchers 2020/2019 in Web of Science,ACS Nano Rising Stars Lectureship Award,Frontiers in ChemistryRising Stars, Nanoscale Emerging Investigator Award, Okawa Foundation Research Award, MINE2020 Young Scientist Excellence Award, TenCate Protective Fabrics Award,Materials Research Society Graduate Student Award, National Award for Outstanding Students Abroad, National Scholarship of China, and many others.

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Textile Engineering

November 01, 2021

Keynote Forum

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Textile Engineering
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Contactless Surface Roughness Measurement of the Seersucker Woven Fabrics

Malgorzata Matusiak
Lodz University of Technology, Poland

Abstract

Surface topography of the textile materials is very important form the point of view of their further processing and usage, especially sensorial and physiological comfort of clothing user. Textile materials are in permanent direct contact with the human skin throughout life from birth to death. Due to this fact the surface properties of fabrics and textile products are crucial for utility comfort of their usage. The aim of presented work was to analyze the surface roughness of the seersucker woven fabrics. Such kind of fabrics is characterized by presence of a three-dimensional (3D) wavy effect created by puckered and flat strips occurring in warp direction. A structure of the seersucker woven fabrics influences their properties. Measurement of the surface roughness parameters of the fabrics was performed by means of the contactless method using the MicroSpy® Profile profilometer. It is an optical measuring tool for the precise measurement of surface topographies using the principle of chromatic distance measurement. The sensor FRT CWL (chromatic white-light) used in the MicroSpy® Profile is based on a patented method which makes use of the chromatic aberration of optical lenses. The following parameters characterizing the surface roughness of the seersucker woven fabrics were determined: height parameters such as: root mean square height of the scale-limited surface, maximum peak height of the scale limited surface,arithmetical mean height of the scale limited surface etc., autocorrelation function of the surface,angle distribution,fractal dimension.

On the basis of the results the relationships between the surface roughness parameters of the seersucker woven fabrics and their selected comfort-related properties were analyzed using statistical tools.

Biography

M. Matusiak, Associate Professor
Dr. Hab. Eng. Małgorzata Matusiak is currently an associated professor in Faculty of Material Technologies and Textile Design, Lodz University of Technology, Lodz Poland. Her current research focuses on clothing technology, thermo-physiological comfort, textile material engineering, surface roughness measurement. She is author of 2 books, book, 11 chapters in monographs, 43 journal articles, 3 patents and many conference papers. She is a member of Executive Committee of ICCTM (International Committee of Cotton Testing Methods) at ITMF, Fiber Society and International Cotton Researchers Association ICRA, and honorary member of Gdynia Cotton Association. In 2015, she was awarded by the President of Poland with the Silver Cross of Merit for merits in activities for the environment and the cotton industry. In 2013, she was awarded the "Meritorious for the Cotton Chamber in Gdynia".

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Textile Engineering

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Invited Forum

Enhancement Mechanical Properties of Graphene Aerogels for Manufacturing Phase Change Material (PCM) Composites

Chengbin Yu
Seoul National University, South Korea

Abstract

The graphene aerogels are widely utilized as a supporting materials due to the light weight and high internal porosities. The phase change material (PCM) which can absorb or release a large amount of heat during the phase transition process. However, the leakage problem is occurred among the PCMs and restricts the applications. Thus, the graphene aerogel can infiltrate these PCMs into the 3D internal space so that sustain the initial solid state under the melting process. Though the graphene aerogel supported PCM composites can forbid the leakage problem, the volume shrinkage of graphene aerogels under the infiltration process become a new problem and which makes mass loss of PCM matrix. Therefore, polydimethylsiloxane (PDMS) embedded and cysteamine cross-linked graphene aerogels are mentioned to reduce the volume shrinkage effectively. These modified graphene aerogels supported PCM composites contain more of PCM than that of originals and increase the thermal energy storage abilities. In addition, the PCM composites form stability is measured under the high temperature with external force. The cysteamine cross-linked graphene aerogel supported PCM composite even exhibits a higher mechanical property than any other composite.

Biography

Chengbin Yu, Researcher.
Degree of Bachelor: 2009.09 ~ 2013.06 Beijing University of Chemical Technology (BUCT). Polymer Science and Engineering.
Degree of PhD: 2013.09 ~2019.02 Seoul National University (SNU). Material Science and Engineering.
Have published 8 papers (5 first author, 3 co-author), and 5 papers (4 first author, 1 co-author) are under revision process. The published journals are Energy Conversion and Management, Macromolecular Research, Fibers and Polymers, Polymers for advanced technologies, Journal of Sound and Vibration, Materials & Design. Journal of Polymer Research, ACS Applied Energy Materials, Applied Energy, Chemical Engineering Journals are under the reviewing. The research area contains nanocomposite, polymer processing, energy storage and harvesting.

The End User's Role in Sustainable and Circular Designs

Yogesh Gaikwad
Society of Dyers and Colourists, India

Abstract

The paper is an attempt to highlight the customers perception of sustainability and circularity and how this is important to design products that meet or better expectations. Customer is the pinnacle of the textile manufacturing ecosystem and needs to be researched for his expectations from the products (in this case apparels) he buys. The behaviour of the common man during buying is abstract and depends on his personal perceptions, culture, social status and buying power among many other influences. The current design and manufacturing are restricted to meet the legal and brand compliance demands. This approach ignores the customers expectation partially or wholly. Customer uses the maximum resources when he is using the product, for example during washing, ironing, dry cleaning, drying. The ignorance of being the dominant user of the resources creates a lack of responsibility among the end-users. Various approaches are put forward to create awareness among end users about
a) Identification of the products for their ratings in sustainability.
b) Circularity characteristics.
c) Energy saving during usage.

An informed end user creates a competitive environment that is beneficial to the supply chain to maintain its integrity and authentic characteristic with the customer. Design approaches to create apparels that last longer, require minimum maintenance/care, preserve their newness in colour, size, texture, have a well described disposal guidelines are discussed. Designing is identified as key element to pursue the mission of 'Customer satisfaction as way of doing businesses.

Biography

YogeshGaikwad, Director.
Mr Yogesh Gaikwad has more than 25 years of technical and Business management experience. He has worked with charities and private sector and adopted easily to their missions. Born in Mumbai, India, Graduated from SASMIRA college in Textile Chemistry, he also holds a Marketing and Management qualification from same college.
Works as a Director for SDC International (which is owned by Society of Dyers and Colourists).

2nd International Conference on
Textile Engineering
November 01, 2021

Development of Prediction Models and the Study of the Influences of Input Parameters for Drape Characteristics and Drape Profile of the Embroidered Fabrics

Anirban Dutta
Government College of Engineering & Textile Technology, India

Abstract
Drape behaviour of apparel fabric is one of the most important parameters so far as the aesthetic and comfort characteristics of the garment are concerned. Many researches are available in the domain of the drapeability of the woven fabrics. But, a large amount of woven fabric undergoes another additional operation i.e. the surface ornamentation with embroidery through the computerised embroidery machines, which involves the interlocking of decorative threads inside the fabric structure. It is therefore essential to study the drape characteristics of the embroidered fabrics as well. Moreover, as the perception of the drape of fabric involves the cognitive characteristics of the individual consumers, it is essential to establish prediction models for both the objective and subjective drape characteristics of the embroidered fabrics. In this context, an effort has been made in this research to develop simple and user-friendly prediction models for both drape-coefficient and the subjective rating of drapeability of embroidered fabric, based upon the principles of linear multiple regression and fuzzy-logic algorithm respectively. Both the prediction models are verified with fresh set of samples and the prediction accuracy is tested statistically through the Analysis of Variance (ANOVA), coefficient of determination, residual analysis and graphical analysis. Very high degree of prediction accuracy is obtained in case of both the prediction models . In addition to that , the influences of relevant input parameters have been studied through both regression coefficients and the response surface diagrams. Also the effects of various embroidery parameters on the number of nodes and the drape profile have been studied in detail through both statistical and graphical analysis. The drape-coefficient of the base fabric, Stitch density, denier and tenacity of the embroidery thread have been emerged as the influential parameters, followed by the stitch length and the stitch angle.

Biography
Mr. Anirban Dutta: M.Tech (Textile Technology), Assistant Professor in Apparel & Textile Technology at the Govt.College of Engineering & Textile Tech, Serampore. Patron Member in 'The Textile Association (INDIA)'. Total 15 years in academic profession and 5 years in Industry. B.Tech and M.Tech in Textile Technology from the University of Calcutta , India . Ph.D. Scholar in the Maulana Abul Kalam Azad University of Technology, W.B., India. Salient research and teaching domains are: Properties of embroidered fabrics, Apparel Production, Production planning and control and industrial engineering in garment manufacturing, CAD & CAM in Apparel and Textile Industry. Presented research papers in nine international and national level conferences till now. Total ten publications in reputed international journals of Emerald publication, Springer Open , Elsevier publication , North Carolina State University , The Textile Association of India etc. till date. A regular reviewer for the Journal of Textile Association (JTA), India.

Dr. Biswapati Chatterjee: Ph.D. (Textile Technology), Professor in Textile Technology at the Govt.College of Engineering & Textile Tech, Serampore. Total 35 years of Teaching and research experience. B.Tech in Textile Technology from the University of Calcutta , M.Tech and Ph.D. in Textile Technology from the IIT , New Delhi , India. A number of publications in various international and national journals.

2nd International Conference on
Textile Engineering
November 01, 2021

Efficacy of Aloe Vera in Textile Finishing Process as a Bio-Mordant

Zahra Ahmadi
Amirkabir University of Technology, Iran

Abstract
Today, many researches have been done in the field of identification and application of natural dyes for environmental protection by reducing the use of co- agent and synthetic dyes. The bondage between dyes and textiles are weak then use of mordants are inevitable. Mordants are salt of heavy metals commonly, when they are used in high concentration not only caused the hardness of textiles but also, they are harmful for environment. Many researches have been done to decrease the amount of mordant or introduction of bio mordant.in this study Aloe vera, which has a polyphenolic structure, was used to improve dyeing fastness and preserve the original hue in natural dying and printing process. Besides improvement dyeing parameters, textiles treated with Aloe vera got antibacterial and antimicrobial activities. Based on the results of experiments, it was found that the use of Aloe vera reduces the amount of alum mordant to about 1%. The use of Aloe vera as a bio-mordant had no effect on the final hue of dyes and significantly reduced the use of alum mordant.

Keywords
Herbal mordants, Metal mordants, Natural Dyeing, Natural Printing, Aloe vera.

Biography
I am Zahra Ahmadi, Associate professor in Art University, Hand woven Carpet Group. Actually, my field of research is Natural dyeing. Some of the research that has been done by our teem titled in:
1) Evaluation of color sensitivity to dyeing parameters in natural dyeing with anthocyanin,
2) Effectual parameters on the natural dyeing process
3) Up cycling for product design of jeans wastes with an economic and environmental approach,
4) Evaluation of herbal mordant efficiency and its Interaction with different natural dyes in the woolen yarns dyeing process
5) Fastness and Dyeing Properties of woolen yarn dyed by sunflower seed hulls
A review on antibacterial, antifungal and microbial properties of natural herbals & their application on the textiles

Innovative Technologies for Cleaning/Reuse of Textile Effluents

Wolfgang Höhn
Hoehn Textile Engineering, Germany

Abstract

Based on the status quo of effluent situation worldwide and conventional waste water treatments in textile industry there are described more advanced and best state of art methods of textile effluent treatment. They are no longer in stage of development but already introduced broadly and well practically proven.
These innovative methods are at least enabling to meet the newest and even futurel governmental and non-governmental (e.g. acc. to GOTS 6.0, Bluesign, Eco Passport, Inditex, ZDHC level 3) effluent regulations at minimum costs.
Maximum they permit partial to complete waste water recycling (optimum target: zero effluent discharge company) which is becoming more and more important, particularly in the Asiatic and African countries, where clear water is an expensive resource. The from textile chemist expert's point of view necessary limit values for ingredients in process water in textile industryy are described and commented. They are met or even by far fallen below by the reported technologies of recycling permitting optimum operational safety during textile wet processing.
Well proven technologies which are reported about are particularly:
Electrocoagulation, membrane filtration, wet oxidation and combined methods.

Biography

Wolfgang Höhn. Textile chemist and finishing engineer, senior consultant, owner of HOEHN TEXTIL ENGINEERING, Germany.
He was born in 1964 in Kulmbach, Bavaria, Germany and has studied "Textile Chemistry and Finishing" at University of Applied Sciences, Coburg, Germany with degree "magna cum laude", graduation 08.1990.
From 08.1990 – 02.2018 he was engaged in leading positions of development and application of textile auxiliaries and waste water treatment at prestigious textile auxiliary manufacturers in Germany and Switzerland.
Since March 2018 Wolfgang Höhn he is independent and founded his own company "Hoehn Textile Engineering", Germany, providingchemical/technical/ecological senior consultancy for textile industry and associated segments worldwide
For the time being he has got approx. 30 partners amongst the textile auxiliary suppliers and companies providing effluent treatment equipments. He is in touch with a major percentage of textile companies in Central, Western, Northern and Eastern Europe and in Mauritius
Furthermore he is consulting with his textile chemical and waste water treatment expertise the textile chemistry institute of university RWTH Aachen, Germany.

Alternative Eco-Friendly Approach for Textile Cleaning Using Ultrasound System

Geiskopf Sebastien
University de Lorraine, France

Abstract

Textile industry are concerned by pollution issues and environmental impact at different stages of manufacture of fabrics including textile desizing, dyeing, wastewater treatment, water consumption, as well as chemical and detergent release. Removal and treatment of dyes from wastewater is widely studied in the literature. This paper will focus on the upstream step of the textile fiber treatments concerning the desizing process. This latter is essential to guarantee a perfect dye adhesion to the fibers. However, desizing requires a lot of water, uses a large amount of detergent, acids and otherchemical products. In addition, there is a wide variety of natural and synthetic fibers, which are submitted to different sizing methods, and each resulting fiber/sizing agent system requiresits own cleaning process.With the aim ofsavingresources and energy, the ultrasound approach is an ecofriendly technology has shown high efficiency for the textile cleaning at laboratory scale. However, systematic and comparative studies focused on living textiles produced by existing industries are needed to practically envisage the scale-up of an ultrasound-based technology. In our work,ultrasounds were applied to removesizing agent via a mechanical action. Three different types of commonly used textiles (cotton, polyester, polyamide/cotton) from different type of fabric (warp and weft, lace, mesh) were investigated. Their characterization subsequent to the sonication treatment by complementary techniques scanning electronic microscopy, energy-dispersive X-ray spectroscopy, optical and vibrational technique (FTIR, UV-Visible, Raman) and chemical technique (Soxhlet extractor) will be discussed.

Biography

Sébastien Geiskopf received a master's degree in physics in 2016. He completed a PhD centered around optical and vibrational characterization of silicon-rich silicon oxide thin film doped with phosphorus and silicon phases. For his current postdoctoral position at the Institute Jean Lamour (Nancy, France), his expertise in fundamental and applied physics is applied to textile cleaning by ultrasound system and optimize parameter of ultrasound system.

2nd International Conference on
Textile Engineering
November 01, 2021

Novel Prototype for Automatic Recognition of Medullation in Alpaca (Vicugna pacos) and Llama (Lama Glama) Fibers

Edgar Quispe Peña
Universidad Nacional Agraria La Molina (UNALM), Lima Perú

Abstract
There is a need to have dispositive for quick evaluation of medullationin camelid fiber, because it will solve problems in the textile industry and animal production. Fibers from alpaca and llama are characterized by a high incidence of medullated fibers and high variability of fiber diameter. The prickling and heterogeneity of the fabrics and garments are more intense as the incidence of fiber medullation increases. This work was carried out aimed at designing, building and validating an automatic and intelligent prototype that allows the automatic recognition of medullation in alpaca and llama fiber by using Artificial Intelligence (AI)technology.The design and construction of the prototype was developed in Lima, Peru. The dispositive components were assembled considering four systems: mechanical, optical, electronic and informatics, which work synchronously scanning the fiber samples previously prepared. The captured images (150-180 photos/min) and processed using the AI model developed in Python, show at computer the resultsin percentage in a graphical user interface developed in C programming language. For validation, 76 and 40 of white alpacaand white and light-coloredllama fiber samples were evaluated using a projection microscope (PM) and the prototype. Correlation analysis, regression and test of means were carried out. Results showed a Pearson correlation of 0.99 and 0.97 for alpaca and llama fiber with regression coefficients of 0.97 and 0.80. The mean test did not find a significant difference (59.26% Vs 61.04% and 57.46% Vs 54.80%, for PM and new prototype, respectively for alpaca and llama fibers). It is concluded that the incidence of medullation in fibers of alpacas and llamas can be evaluatedby artificial intelligence in a practical, objective and fast way.This information can be used in the textile industry for quality evaluation and,inanimal genetic improvement programs for the identification of best breeding stock.

Biography
He studied at the UNALM, Perú and graduated as MSc. in 2000 and received his PhD degree in 2010.He was professor and researcher at Huancavelica National University among 1992 -2012. His study area is about South American Camelids fibers and Improvement genetic on alpacas and llamas. Also, He was Vice Rectorate of Researchworked at Chota Autonomous National University obtained the position at. Since 2015 is CEO of Natural Fiber´s Tech and Professor and Researcher of the UNALM. He has published more than 40 research articles in journals of animal production and technologies. Also, He obtained three patents and wrote four books.

Strategic Diagnostic Tool Proposal - "Toolbox Cluster 4.0

Lisleandra Machado
Federal Institute of Southeast Minas Gerais, Brazil

Abstract

The objective of this article is to propose a strategic diagnostic tool (Toolbox) for the cluster of the Textile / Clothing and Fashion industry in Minas Gerais, Brazil, aiming at preparing for the I4.0 environment. From the main objective, some specific objectives are established for its support, described below: (i) Identify thes-trategic categories of management, governance, expansion, etc., for textile and clothing clusters in Brazil and in the world; (ii) Identify the compliance levels of the strategic categories based on maturity models, toolbox, structural models, proposed for I4.0; (iii) For future work, a survey (field research) will be carried out involving employers, researchers in the area, members of the government and leaders of LPA support entities and international organizations. For the theoretical basis of this work, a survey was carried out in the following databases: Scopus (Elsevier), Materials Science & Engineering Database, Sage Publications (CrossRef), OneFile (GALE), SpringerLink, Emerald Insigth, Taylor & Francis Online were used to deepen the analysis of the information. In section two, the methodological procedures are presented, followed by the theoretical framework on clusters and Toolbox. In section four, the Toolbox proposal is presented: Strategic Diagnosis towards 4. In item five, finally, the final considerations that include and detail are presented the contribution achieved.

Biography

Lisleandra Machado
IF SUDESTE MG - Instituto Federal do Sudeste de Minas Gerais - Campus Santos Dumont, professor engineering departament. - Brazil
Researcher by CNPQ, FAPEMIG, FUNDEP and CAPES.Graduated in business administration, production engineering and pedagogy. She has deep knowledge in logistics and textile industry clusters and their forms of organizations in local productive arrangements (lpas) and supply chain management and develops institutional research and extension projects in the area of engineering, socio-applied sciences, education and distance education (education) remotely).

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Textile Engineering

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Creep Fatigue in Properties of LDPE Multilayer Films used as Warm House Cover

Khaled DJAKHDANE
University of Tiaret, Algeria

Abstract
The purpose of this study deteriorating effect of natural ageing on tri-layer and monolayer polyethylene films used as glasshousecover in the NorthAfricaenvironment. The films washanded out by Agrofilm and composed of lowdenseness polyethylene (LDPE), holding admixture (e.g.,color and infrared IR and ultraviolet UV stabilisers). This film was used to strengthen and set up a real warmhousesituated in the northern of Algeria. The influence of growing oldwas, controlled by watching the modifications in mechanical (robustness and flexibility) features. The study has been conductedduring a period of ninemonths of natural ageing. The films have been spontaneously matured and growolder. The resultsdiplaythat the environmental components have deteriorating effects on the sustainability and all properties of the polyethylene film. The studyillustrateclearlythat the degradationparametersevaluated are directlylinked to standard for estimating the efficiency of usingwarmhousefarming. The consequence of temperature and UVA radiation generated the mostsignificantdegradation on the film surface and accordingly a decrease in the whole life existence of the material.
Keywords: LDPE, Mono-layer and tri-layer films, Ageing, Degradation

Technical Embroidery as Reinforcement of Textile Composites

Marcin Barburski
Lodz University, Poland

Abstract
Embroidery is primarily associated with the traditional art of decorating textiles with a needle and a thread or a yarn. Currently, embroidery has many functional technical applications. It is a process that allows the creation of three-dimensional light structures and the placement of threads on the base material in any direction. A specific feature of such composite reinforcements is their anisotropic properties due to the significant influence of the fibre orientation on the stresses in the elements. The paper focused for mechanical properties textiles composites reinforcement by technical embroidery.

The study presents the results of strength tests of composites containing seven layers embroidery systems. Each variant included different directions of arrangement of individual layers as a reinforcement. Flax and glass fibres roving was used to strengthen the composite. The composite was made using the vacuum bag method, using epoxy resin. The mechanical properties of composites largely depend on the type of fibres used as reinforcement, the way they are arranged in the composite and their volume share. Based on the research, it can be concluded that the arrangement of the roving in the direction of the tensile force allowed to obtain the best mechanical properties. With the help of a computer embroidery machine, it is possible to control these parameters and give the produced material the expected properties.

Biography
Marcin Barburski DSc. Associate professor
Since 2005, he is employed at the Faculty of Materials Technologies and Textile Design in the Institute of Architecture of Textiles. Received PhD in 2007 and habilitation in 2016. Since 2019 he has associate professor position. His scientific activities include matters basically concerning formation of the textile structures for a specified purpose - dedicated textile structures, the modelling structure and properties of fabrics under mechanical loading, technical textile, conveyor belts, steel fibres knitted fabrics as well as textile products made for composites, technical embroidery and textiles acoustic barriers and X-ray tomography used to analyse textile structure. Currently he is the coordinator of the project financed by the EU in the National Centre for Research and Development “Practical design at the Lodz University of Technology - second degree studies”

2nd International Conference on
Textile Engineering
November 01, 2021

Development on 3DMulti-Functional Knitting Fabrics & the Template Library creation and Application of whole Knitted Garment

Jianping Wang
Donghua University, China

Abstract

With the increasing of the demand for sports and fashion in the world, the research of 3D multi-functional knitted fabrics and whole knitted garment design and technology is undoubtedly a development trend.Whole Garment knitwearis one of the knitwear development trends in the foreseeable future for its advantages of environmental friendliness and wearing comfort. However, the development of new styles of the Whole Garment Knitwear requires both fashion design and computer programming, which makes it time-consuming and difficult. In this report, 3D multi-functional knitted fabrics based on biomimetic and topological structure will be developed and evaluated. Meanwhile, the Whole Garment (like a Knitted Skirt) Template Library is introduced to solve this problem.The template library composes of silhouette module, design element module and parts shaping technology module. It was builtbased on a comprehensive investigation of design and technology. By adhering to the principle of similarity and re-usability, the template library of Whole Garmentknitted skirtswas established through the innovative design and hierarchical classification of compressed patterns and package patterns.With the template library,more than 7.7×10^{25} package pattern templates can be generated through the permutation and combination of the package pattern templates of design elements and parts shaping technology.The results indicated that it canaccelerate the design process and improve the design efficiency of new styles by 55%with the template library. This approach can also provide inspiration for the designers and realize rapid response and personalized customization of knitted garment production. In addition, The Whole Garment templates canbe applied into constructing other types of clothing template libraries such as pants, jackets & etc.

Biography

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Jianping. Wang, Professor & PhD Supervisor of Donghua University, PhD of Fashion Design and Engineering, is a discipline leader of the advanced garment manufacture engineering in Donghua University and a committee member of International ISO□IECTechnical Expert. The research area is ergonomics, computer aided design, intimate appareland sports wear development. As a foreign student for Japan, Hongkong, American, England, and also as a co-tutorial doctoral, theinternational cooperation projects dealt with intimate apparel design and engineering for Cornell University and North Carolina State University in the America, WollongongUniversity of Australia, Sookmyung Women's University of Korean& etc. The knitted garment design and engineering is studied for ShimaSeiki, StollandSantoni.

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Industry 4.0 and Artificial Intelligence in Textile Manufacturing

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Abstract

Textile structures are complex and their manufacturing processes are labor intensive. With the technological developments, automation made same tasks to be performed with less time and less employee labor. Now, most of the textile machineries used for different manufacturing process; spinning, knitting, weaving, dyeing, etc. includes many different sensors, actuators and software. With industry 4.0 enhancements, real-time monitoring of the process come easier and provided more sensitive, accurate and efficient manufacturing. On the other hand, advances in image acquisition and computer technology enabled an effective real-time quality monitoring such as fiber contaminant elimination,yarn bobbin sorting and fabric inspection. In this presentation, the industry 4.0 technology applications in textile industry will be introduced. It will be discussed that how the artificial intelligence will contribute to textile manufacturing processes and how it will trigger the high quality - cost effective textile manufacturing.

Biography

H.İbrahim ÇELİK, Gaziantep University, Textile Engineering Department.
H.İbrahim ÇELİK is Assoc.Prof.Dr. in Gaziantep University Textile Engineering Department. He completed his doctoral thesis in Mechanical Engineering department on the development of fabric inspection system with image processing. He managed and successfully completed three Government funded projects on design of machine vision systems for fabric and yarn quality inspection processes. He also consulted research and development projects on development of automation and machine vision systems for textile industry. An automatic test device is designed and manufactured by him for carpet static loading and resilience tests. H.İbrahim ÇELİK continues his studies on automation in textile machinery and test equipment, artificial intelligence applications for textile industry, image processing and machine vision systems, smart textiles, wearable electronics. He has authored over 60 peer reviewed publications and congress articles, 2 book chapters.