ÓBUDA UNIVERSITY
REJTŐ SÁNDOR FACULTY OF LIGHT INDUSTRY
AND ENVIRONMENTAL ENGINEERING

A MAGYAR TUDOMÁNY ÜNNEPE
Az MTA programsorozata

IJCELIT 2023. BOOK OF ABSTRACTS
OF THE 9TH INTERNATIONAL JOINT CONFERENCE ON ENVIRONMENTAL AND LIGHT INDUSTRY TECHNOLOGIES [PDF]

Budapest, Hungary
2023

IMPRESSUM

It is a booklet of abstracts of the **9th International Joint Conference on Environmental and Light Industry Technologies** held online on 10 November 2023.

The International Conference IJCELIT intends to unite researchers, engineers, and creative artists involved in environmental and light industries, from fundamental research to industrial applications. IJCELIT consists of three simultaneous events, with a joint plenary session highlighting technological developments and trends and their effects on the biophysical environment. Each event showcases selected scientific-technical papers and highlights emerging technologies in the areas of:

- Graphic Technologies: Graphic Communications Technology Workshop (GCTW)
- Industrial Design and Material Technologies: International Symposium on Design and Innovative Technologies (ISDIT)
- Environmental Engineering: Workshop on Environmental Sciences and Engineering (WESE)

The conference was organised in the framework of the Hungarian Scientific Season. The Rejtő Sándor Faculty of Light Industry and Environmental Engineering of Óbuda University, Budapest, Hungary, carried out this publication.

IJCELIT 2023. Book of Abstracts of the 9th International Joint Conference on Environmental and Light Industry Technologies [PDF]
Publisher: Rejtő Sándor Faculty of Light Industry and Environmental Engineering of Óbuda University, Budapest, Hungary
November 2023
Editor: Dr. Edit Csanák
ISBN 978-963-449-332-7
Conference homepage: https://rkk.uni-obuda.hu/ijcelit-2023/

TABLE OF CONTENTS

COMMITTEES

Patron:	**Prof. Dr. Levente Kovács** Rector, Óbuda University
General Chair:	**Dr. habil. László Koltai** Dean, Óbuda University, Rejtő Sándor Faculty of Light Industry and Environmental Engineering
Co-chair:	**Dr. Edit Csanák DLA** Vice dean, Óbuda University, Rejtő Sándor Faculty of Light Industry and Environmental Engineering

Members of the Scientific Committee:

Dr. Rita Bodáné-Kendrovics, Óbuda University RKK, Associate Professor

Dr. Edit Csanák DLA, Óbuda University RKK, Associate Professor

Prof. Dr. Márta Kisfaludy DLA, Óbuda University RKK, professor

Prof. Dr. Marianna Ágnes Halász, Óbuda University RKK, professor

Prof. hc. Dr. Csaba Horváth, Óbuda University RKK, honorary professor

Prof. Dr. Hosam Bayoumi Hamuda, Óbuda University RKK, associate professor

Dr. habil Róbert Németh, Óbuda University RKK, associate professor

Dr. Ákos Borbély, Óbuda University RKK, associate professor

Dr. Tamás Csiszér, Óbuda University RKK, associate professor

Dr. Krisztina Demény, Óbuda University RKK, assistant professor

Dr. Csaba Ágoston, Óbuda University RKK, assistant professor

Scientific Coordinator and Operative Assistant:

Andrea Tóth, Óbuda University, RKK

ABSTRACTS

PLENARY LECTURES

POLYMER FIBER ARTIFICIAL MUSCLES AND RECENT DEVELOPMENTS

Fatma GÖKTEPE
Tekirdağ Namık Kemal University, Çorlu Engineering Faculty, Textile Engineering Department, TÜRKİYE

Artificial muscle is a generic term used for fibrous materials that can reversibly contract, expand, or rotate within one component due to an external stimulus, such as voltage, current, pressure or temperature. Artificial muscles are needed for diverse applications, ranging from humanoid robots, prosthetic limbs, and exoskeletons to comfort-adjusting clothing for a long time, and therefore there have been enormous efforts by researchers to develop such a material. There are different approaches and materials used for artificial muscles such as electro-thermally driven shape-memory metal wires, thermally powered shape-memory polymers, high-performance hybrid CNT muscles and so on, but mainly performance, scalability, and cost problems have restricted their deployment. In this work, a completely new type of artificial muscle based on ordinary fibers such as nylon used for fishing line and sewing thread is described which is a breakthrough leading to significant change in directions of the studies in this field [1]. These new artificial muscles can be engineered to obtain high level of actuation or load capacity depending on priority by converting ordinary polymer fibers into powerful muscles as twisted and coiled or mandrel type actuators. These muscles can also be designed to contract or expand by external stimulus and they can provide reversible contraction which is higher than that of mammalian skeletal muscle (20%) and lift loads 100 times heavier than a similar length/weight of natural muscle. Also, they can be woven or knitted into textiles leading further applications such as smart morphing or actuation textiles [2].

Keywords: Polymeric artificial muscles, tensile actuation, torsional actuation.

[1] Haines C.S., Lima M.D., Li N., Spinks G.M., Foroughi J., Madden J., Kim S.H., Fang S., de Andrade M.J., Göktepe F**.**, Göktepe Ö., Mirvakili S.M., Naficy S., Lepro X., Oh J., Kozlov M., Kim S.J., Xiuru X., Swedlowe B., Wallace G.G., Baughman R.H., *"Artificial Muscles From Fishing Line and Sewing Thread"*, Science, 21 Feb. 2014, 868-872.

[2] Ö. Göktepe, F. Göktepe, N. Li, S. Fang, L.M. Dimas, C.S. Haines, R.H. Baughman, *Actuating Textiles Containing Polymer Fiber Muscles*, WO2017165435A2, 2017.

Corresponding address:
Prof. Dr. Fatma GÖKTEPE
Tekirdağ Namık Kemal University, Çorlu Engineering Faculty,
Textile Engineering Department, Silahtarağa Mevkii, Üniversite 1. Sokak 59860 Türkiye
E-mail: fgoktepe@nku.edu.tr or goktepef@gmail.com

ADVANCED MACHINERY FOR GARMENT FINAL PRESSING

Ineta Nemeša[1], Marija Pešić[1], Nadiia Bukhonka[1], Inese Ziemele[2], Valentina Bozoki[1]

[1] Technical faculty "Mihajlo Pupin", University of Novi Sad, SERBIA

[2] Riga Technical University, LATVIA

The garment finishing covers operations required to complete a garment: final pressing, folding and packing. The final pressing is done to increase quality and visual appearance of ready goods at garment factories, industrial laundries and dry-cleaners. Unwanted creases are removed by different style and productivity steam finishers and finishing tunnels. Flat single or double leg presses and contoured topping presses are used to get final look and needed creases on trousers. Wide variety of molding machinery is available to create 3D shapes in separate parts of ready garments. Four trends are actual in further development of finishing equipment: increased application, automation, digitalization and energy saving. Automation makes the finishing machinery highly programmable and reduces the need for manual labor. The machines can be connected to customer ERP networks to monitor and control work process in real time on-line. The finishing equipment becomes multi-functional and modular for wider range of applications in medium and small capacity production sites. Heat recovery systems and improved air and steam flow principles help to reduce energy consumption of advanced finishing machinery.

Keywords: garment finishing, final pressing, steam finishers, finishing tunnels, shaping presses

Corresponding address:
Ineta Nemeša
Department of basic and applied sciences
Technical Faculty "Mihaljo Pupin"
University of Novi Sad
Đure Đakovića bb
23101, Zrenjanin, Serbia
E-mail: inetavil@gmail.com

GRAPHIC COMMUNICATIONS TECHNOLOGY WORKSHOP (GCTW)

ORAL PRESENTATIONS

COMMUNICATING SCIENCE AND HEALTH. MOTIVATION PROTECTION THEORY, COMMUNICATION DESIGN AND COVID-19

Manuela Zambianchi, Lorenzo Volpe

University Institute ISIA, Faenza, ITALY

The communication of science to not expert people represents nowadays a crucial and emerging issue. The Social Representation approach (Moscovici, 2000) evidenced the socio-cognitive and emotional processes involved in the transformation of a scientific theme, perceived as a threat, into a common social representation. In the era of digitalization the design of health social communications based on authoritative sources but with a comprehensible language is urgent.

A study was conducted based on theoretical models of Health Psychology and the principles of Communication Design in order to create a set of protective messages against Covid-19. After, a research testing the efficacy of two of these messages involved 101 Italian participants (m. age 42.16; DS = 20.68). They filled in two self-report questionnaires and three single item asking the preferred media sources of information for Covid-19 evolution. Results confirmed the persuasive efficacy of both messages, the former about facial mask and the latter about vaccination. The perceived efficacy of two messages shows positive Pearson's correlation with the four components of the Protection Motivation Theory (range: 0.21 - 0.61; $p < 0.05$ - < 0.001 for mask message; range: 0.23- 0.63, $p< 0.05$ - < 0.001 for vaccine message). Results obtained encourage this research avenue, with the integration of communication design creativity with psychological science for the promotion of health at individual and community level.

Keywords: Science communication; Health Psychology; Design Communication; Covid-19

Corresponding address:
Manuela Zambianchi
University Institute ISIA
Corso Mazzini n.93
Postal code, Faenza, Italy,48018
E-mail: zambianchi_manuela@isiafaenza.it

THE INFLUENCE OF PACKAGING ON FOOD PRODUCT SHELF LIFE: REDUCING FOOD WASTE AND EXPLORING ENVIRONMENTALLY SUSTAINABLE APPROACHES

Teodora Gvoka, Gojko Vladić, Gordana Bošnjaković, Magdolna Pál, Gala Golubović, Katarina Maričić
University of Novi Sad, Faculty of Technical Sciences, Department of Graphic Engineering and Design, Novi Sad, Serbia

Although world hunger remains a pressing problem, unfortunately, a significant amount of produced food is thrown away, resulting in environmental waste. Although food waste may seem less noticeable compared to other forms of environmental pollution, it is a major environmental challenge. The impacts of food waste go beyond its outward appearance and include excessive energy consumption, resource depletion, and more. At the same time, food packaging, often perceived as a significant environmental burden, is ubiquitous in public spaces around the world. Nonetheless, packaging performs indispensable functions: It protects food from external hazards, extends its shelf life, facilitates grouping, and preserves its essential properties. This paper aims to highlight the extent of food waste and its negative impact on the environment. It also attempts to propose possible solutions to this problem through innovative packaging solutions. This paper discusses various materials suitable for food packaging and their potential to have a positive impact on the environment.

Keywords: food waste, sustainable packaging, food packaging

Corresponding address:
Teodora Gvoka
Department of Graphic Engineering and Design
Faculty of Technical Sciences
University of Novi Sad
Trg Dositeja Obradovića 6
21000 Novi Sad, Serbia
E-mail: teodora.gvoka@uns.ac.rs

SPECTRAL AND COLORIMETRIC EVALUATION OF LAMINATED DIGITAL PRINTS

Ákos Borbély

Óbuda University, Faculty of Light Industry and Environmental Engineering

Lamination is surface finishing by bonding a layer of material, which is typically plastic. The primary function of this layer is to protect the surface underneath. In case of printed documents the appearance of the colors will change. Light will interact the complex structure of the laminate and the print in a different way relative to the original print. It is extremely difficult to simulate this process, because the effect will be influenced by several factors: the surface structure, thickness and material of the plastic film; the type of paper and printing process, etc. If one would like to predict the optical properties of the outcome of the lamination one has to focus on the individual case. Measurements are needed to be able to define the transformation from the original to the laminated sample.

In this study the objective was to characterise the transformation with a small number of parameters while in commercial printing the standard color management profile used for this purpose uses a large data set. Spectral and colorimetric measurements were performed to investigate how lamination affects the colors of the printed sheet. Optical properties of the laminating film, the substrate and the print, as well as standard measurement parameters were considered in the experiments.

Keywords: lamination, digital print, spectral measurement, color measurement

Corresponding address:
Dr. Ákos BORBÉLY
Institute of Media Technology
Faculty of Light Industry and Environmental Engineering
Óbuda University
Address of Institution/Company
1034 Budapest, Doberdó u. 6. Hungary
E-mail: borbely.akos@uni-obuda.hu

ANALYSIS AND COMPARISON OF ARTIFICIAL INTELLIGENCE LOGO GENERATORS

Ivana Tomić, Nemanja Kašiković, Rastko Milošević, Ivan Pinćjer

University of Novi Sad, Department of Graphic Engineering and Design, SERBIA

The use of artificial intelligence-powered tools for generating visual content is growing exponentially over time. They are fast and economical solutions for creating various design products such as business cards, banners, letterheads, posters, and even entire websites or marketing campaigns. However, there is a question of authenticity and whether those creations can compare to the output of a human designer. In this work, we tested different online logo generators based on artificial intelligence to evaluate the options those software tools offer and their outcomes. We created two different logos – one by specifying all the parameters (such as colors, fonts, style…), and the other by keeping the creation process unconstrained, i.e., letting the software choose all the logo elements without our intervention. The results indicate that artificial intelligence logo generators are great tools for creating simple logos if all the input variables are clearly specified. If that is not the case, the output can be visually appealing, but the message to be transmitted can easily be lost.

Keywords: logo design, artificial intelligence, logo generators, logo makers

Corresponding address:
Ivana TOMIĆ
Department of Graphic Engineering and Design
Faculty of Technical Sciences
University of Novi Sad
Trg Dositeja Obradovića 6
21000 Novi Sad, SERBIA
E-mail: tomic@uns.ac.rs

GRAPHIC COMMUNICATIONS TECHNOLOGY WORKSHOP (GCTW)

POSTER PRESENTATIONS

ADSORPTION MECHANISM OF MAGENTA FLEXOGRAPHIC PRINTING DYE ON ACTIVATED CARBON

Vesna Gvoić, Saša Petrović, Živko Pavlović, Gordana Bošnjaković, Miljana Prica

University of Novi Sad, Faculty of Technical Sciences, Department of Graphic Engineering and Design, Novi Sad, SERBIA

Since printing dyes are characterized by a high solubility in water, a considerable part of them ends up in wastewater. Due to their numerous harmful effects, they can cause various health problems for humans and the aquatic ecosystem. Therefore, the removal of dyes from wastewater is important. To date, numerous studies have been conducted in the field of wastewater treatment for the removal of dye molecules, and it has been shown that there is no single method that can be applied to all types of wastewater from the printing industry, as the different nature of the coloring substances must be taken into account.

The aim of this work is to optimize the adsorption process and investigate the adsorption mechanism of Magenta flexo dye (in synthetic solution and real wastewater) on activated carbon. It was found that the mass of adsorbent, pH and reaction time were statistically significant parameters that contributed most to the removal efficiency of Magenta dye. In addition, the adsorption treatment resulted in 98% and 68% efficiency in removing the dye from the synthetic solution and real wastewater, respectively. Finally, it was found that the adsorption of printing dye on activated carbon is best described by the Langmuir model.

Keywords: Magenta flexo dye, activated carbon, adsorption mechanism, optimization.

Corresponding address:
PhD Vesna GVOIĆ
Department for Graphic Engineering and Design
Faculty of Technical Sciences
University of Novi Sad
Trg Dositeja Obradovica 6
21000, Novi Sad, Republic of Serbia
E-mail: kecic@uns.ac.rs

INNOVATIVE MULTIPURPOSE GIFT PACKAGING

Andreja Pogačar, Diana Gregor-Svetec
University of Ljubljana, Faculty of Natural Sciences and Engineering, Ljubljana, SLOVENIA

The legislation and shift in consumer behavior has set eco-design in the front of packaging trends. Packaging eco-design is the process of designing a packaging in a sustainable way.

Actions such as redesigning to use fewer packaging materials, employing sustainable, renewable plant-based, or recycled materials are applied. The innovative design approach to optimize packaging efficiency and create reusable or multipurpose packaging are, besides employing eco-friendly materials, important steps to sustainable packaging.

The objective of our research was to design sustainable multipurpose gift packaging. Packaging made from a corrugated cardboard was designed in a way to attract the consumer with a unique shape that conveys the comprehensive brand image through the packaging's form rather than its graphic design. This approach underscores that unique packaging shapes can also make a brand recognizable, even when the graphic design is of secondary importance. Elements of multifunctionality and the possibility of re-use the packaging were added. With adding a handle, to avoid the use of gift bag, and with the construction that enables storing of different products, multifunctionality of packaging was provided. An exhibition product display that can be assembled from several package units, which can be used instead of promotional stand, is another multipurpose feature of the packaging. After serving its purpose, packaging can turn into a nesting box for solitary bees, enabling a re-use of the packaging. The substance that attracts bees was tested to obtain the right consistency for screen-printing. The stability of packaging was tested. Finally, the survey provided insights into how consumers perceive the enhancement of sustainable packaging through various multifunctional features.

Keywords: packaging, eco-design, corrugated cardboard, multifunctionality, re-use

Corresponding address:
Diana Gregor-Svetec
Department of Textiles, Graphic Arts and Design,
Faculty of Natural Sciences and Engineering
University of Ljubljana
Snežniška 5
1000 Ljubljana, Slovenia
E-mail: diana.gregor@ntf.uni-lj.si

INTERNATIONAL SYMPOSIUM ON DESIGN AND INNOVATIVE TECHNOLOGIES (ISDIT)

ORAL PRESENTATIONS

INFLUENCE OF ARTISTIC STYLES ON CONTEMPORARY DESIGN

Róbert Németh, Éva Hottó, Márta Kisfaludy

Product Design Institute, Faculty of Light Industry and Environmental Engineering, Óbuda University, Budapest, HUNGARY

The impact of the arts in all walks of life is endless and provides an inexhaustible source of inspiration for new generations. Coupled with technological innovation, new fields of visual expression are opening up. What are the most popular and well-known styles, the trends that most influence today's design culture, architecture or even the film and games industry? These are the questions the authors seek to answer, based on the work of well-known designers and the preferences of students.

Keywords: art, design, technological innovation, visual expression

Corresponding address:
Dr. habil Róbert NÉMETH
Product Design Institute
Rejtő Sándor Faculty of Light Industry and Environmental Engineering
Óbuda University
1034 Budapest, Doberdó u. 6, HUNGARY
E-mail: nemeth.robert@rkk.uni-obuda.hu

DESIGN AND PRODUCTION OF INTERMINGLED HYBRID YARN ON WINDING MACHINE

Ayşe Türktaş Ali[1], Gonca Yildiz Pabuşçu[1], Timur Atik[1], Fatma Göktepe[2]
[1]Gülle Entegre Tekstil İşletmeleri Eml. Dan. San. ve Tic. A.Ş., Tekirdağ, TÜRKİYE
[2]Tekirdağ Namık Kemal University, Department of Textile Engineering, Tekirdağ, TÜRKİYE

In intermingled yarns, the filaments are intermingled or entangled in order to avoid their separation during processing. Intermingling of filaments is a substitute for twisting operations and yarn looks tight at the mingle points which are distributed at regular intervals along the yarn length as the mingle points hold the filaments together [1]. Intermingling process changes the arrangement of fibers so that surface structure and reflection properties of the yarn vary. When filaments of the same type are entangled, the yarn is known as an intermingled yarn; and when filaments of two or more types, e.g. carbon and polyester, are mingled together, the yarn is known as commingled yarn. In this work, however, an approach to produce a different type of intermingled hybrid yarn is described by combining short-staple spun yarns with multifilament yarns on a winding machine. For this purpose, yarn winding machine was modified by implementing an intermingling air-jet so that these two different yarn types are combined into a resulting hybrid yarn and eight different intermingled hybrid yarns were produced by combining 100% cotton yarns (Ne 30/1) either with polyester multifilament yarns (75 denier) or viscose multifilament yarns (150 denier). Then, the effect of nozzle pressure (2.5 and 4.0 bar) and effect of winding speed (500 and 750 m/min) on resulting yarn structure and colour is analysed. Also, single-jersey knitted fabrics were produced by using these yarns and the effect of nozzle pressure and winding speed on texture of the fabrics were analysed. The results show that the distance between mingling points increases as the winding speed increases and this leads to more visible filaments on knitted fabric surface. On the other hand, the mingling effect weakens as the nozzle pressure decreases and multifilaments become more visible on the fabric surface in general.

Keywords: intermingled yarns, hybrid yarns, winding machine

[1] R. Alagirusamy and A. Das, Technical Textile Yarns, Woodhead Publishing Limited, 2010, p.6.

Corresponding address:
Ayşe TÜRKTAŞ ALİ
Gülle Entegre Tekstil İşletmeleri Eml. Dan. San. ve Tic. A.Ş., Tekirdağ-TÜRKİYE
E-mail: ayse.turktas@gulletekstil.com.tr

THE RESPONSE OF LEATHER INDUSTRY TO CIRCULAR ECONOMY IN SUSTAINABILITY PERSPECTIVE: A REVIEW

Cemile Ceren Kahraman[1], Arife Candaş Adiguzel Zengin[2]

[1] Usak University, Leather, Textile, and Ceramics Design Application and Research Center, Usak, TÜRKİYE

[2] Ege University, Engineering Faculty Leather Engineering Department, Izmir, TÜRKİYE

The concept of sustainability is gaining considerable interest within academia as well as the service and industrial fields due to the growing number of related expressions and the enhanced understanding of its significance. Concerning about sustainability in any field of industrial production have led to a pressing rationale to enhance the use of natural materials and replace non-renewable fossil-based raw materials.

Sustainable manufacturing methods place emphasis on the use of environmentally friendly techniques, policies, and processes within industrial operations. These practices aim to mitigate adverse environmental effects, promote energy and resource conservation, guarantee the well-being of employees, communities, consumers, and demonstrate economic viability.

The leather industry encounters environmental challenges due to extensive use of chemicals, water, electricity, and labour during the production processes. Therefore, sustainability research has been focused on the environmental aspect within the scope of green chemistry, pollution control, and waste management to implementation of clean manufacturing. This highlights the importance of addressing potential obstacles in the implementation of circular economy practices. Lastly, it has to be emphasized that leather industry performs a circular economy function to upcycle the waste generated from the meat industry. Thus, leather should be regarded as a sustainable material on its own.

Keywords: leather industry, circular economy, sustainability, economic viability

Corresponding address:
Prof. Dr. Arife Candaş Adiguzel Zengin
Leather Engineering
Engineering Faculty
Ege University
Ege University, Erzene Mahallesi Ege Üniversitesi Merkez Yerleşkesi,
35040, Izmir, Bornova
E-mail: candas.adiguzel@ege.edu.tr

FRUIT-BASED SUSTAINABLE TEXTILE MATERIALS

Marija Pesić, Ineta Nemeša, Nadiia Bukhonka, Valentina Bozoki

Technical faculty „Mihajlo Pupin“, Zrenjanin, SERBIA

The textile and clothing industry has been facing major changes in recent years. Considering that it is one of the biggest polluters, transformations in this industry are largely directed towards sustainable development. It seeks to transform the clothing industry based on value propositions that integrate ethics, aesthetics and innovation. In order to respond to these changes, one of the ways is the application of innovative sustainable textile materials. The use of fruit to extract fibers for fabric production represents a unique and innovative development in the field of fiber technology. Natural fibers such as cotton, wool, silk and linen have long been known to the textile industry, but the use of fruits such as orange, pineapple, sugar cane and banana to create environmentally friendly and sustainable fabrics is a relatively new trend. The advantages of the application of fruit-based materials are reflected in biodegradability, eco-friendly approach and renewability. The application of fruit-based materials such as materials obtained from pineapple, apple, orange, banana and others are discussed in this paper, as well as their advantages and disadvantages.

Keywords: eco-friendly fabrics, sustainability, pineapple fiber, banana fiber, orange fiber.

Corresponding address:
Dr. Marija Pešić
Department for basic and applied sciences
Technical Faculty “Mihajlo Pupin”
University of Novi Sad
Djure Djakovica nn, 23000 Zrenjanin, Serbia
E-mail: marija.stankovic.986@gmail.com

ORTHOPEDIC UNLOADING INSOLE DEVELOPING FOR PATIENTS WITH UNILATERAL AMPUTATION USING ADDITIVE TECHNOLOGIES

Dariia Kaptiurova, Liliia Chertenko, Udovenko Olexander

Kyiv National University of Technologies and Design, Kyiv, UKRAINE

Since the war in Ukraine started, the number of people with lower limb amputations has increased significantly. After prosthetics in the case of unilateral amputation of the lower limb, during further walking, the load on the healthy leg is approximately twice as much as on the prosthesis. Therefore, it is advisable to use orthopedic unloading insoles for partial relief of a healthy leg.

This research looks at the advantages of manufacturing such insoles using additive manufacturing. Unlike traditional production, the production of printed insoles is automated and requires less human involvement in the processes. In traditional production, various orthopedic elements and layers of insoles use materials with different properties - EVA-pore, granitol, polymeric thermoplastic materials of different hardness.

This research addresses whether orthopedic insoles printed from one material (Flex filament) would meet the requirements, if the stiffness and elasticity of the insole zones were adjusted not by selecting another material, but by adjusting the filling of layers in the Ultimaker Cura slicer when slicing the model. FDM printing technology was used on an Anet Prusa i3 printer and Flex filament.

Keywords: orthopedic insoles, FDM-printing, additive manufacturing, unilateral amputation.

Corresponding address:
Dariia KAPTIUROVA
Department of Fashion Technology
Faculty of Arts and Fashion
Kyiv National University of Technologies and Design
Mala Shyianovska (Nemyrovycha-Danchenka) Street, 2
01011, Kyiv, Ukraine
E-mail: kadaria132000@gmail.com

INTERNATIONAL SYMPOSIUM ON DESIGN AND INNOVATIVE TECHNOLOGIES (ISDIT)

POSTER PRESENTATIONS

ANALYTICAL STUDY ON THE BIOMECHANICAL EFFECTS ON THE FEET OF WEARING HIGH HEELS AND FOREFOOT SHOCK ABSORPTION STRATEGIES

Rui Sheng[1], Zhonghua Cao[2], Guoxiang Yuan[3,4]

1 Shanghai Art and Design Academy, Shanghai

2 Guangzhou Lüpu Information Technology Co., Ltd., Guangzhou, Guangdong

3 Sustainable Futures - Fashion & Textile, Hong Kong

4 World Textile University Alliance, Shanghai, CHINA

This study aims to delve deeply into the effects of wearing high heels on the structural organization of women's feet, particularly analyzing these impacts from a biomechanical standpoint. Through meticulous analysis of the foot's structural organization while women wear high heels, we unveil the specific influences high heels have on foot biomechanics. The research identifies that wearing high heels significantly increases pressure and impact forces in the forefoot area, consequently heightening the risk of foot injuries. This is mainly attributed to the altered pressure distribution in the foot, leading to greater stress in the forefoot region. To effectively alleviate this stress and reduce the risk of foot injuries, we propose a novel forefoot shock absorption method. This approach involves installing specially designed shock-absorbing pads in the forefoot area of the high heels, a modification that markedly diminishes the force exerted on the foot, thereby lowering the risk of injuries. Not only does this study afford us a deep understanding of the biomechanical implications of wearing high heels, but it also pioneers a new forefoot shock absorption technique, promising a more comfortable and healthy footwear experience for women who wear high heels. This innovative solution not only opens up new possibilities for high-heel design but also offers a practical solution for ensuring comfort while wearing shoes and reducing foot problems associated with wearing high heels. We anticipate that this research will foster further studies and developments aimed at achieving healthier and more comfortable high-heel designs.

Keywords: high heels, forefoot shock absorption, foot anatomical structure, foot tissue motion variation patterns

Corresponding address:
Guoxiang YUAN
World Textile University Alliance
2999 North Renmin Road, Shanghai, 201620, China
E-mail: yuanguoxiang@gmail.com

INNOVATION IN SKYDIVING CLOTHING

Orsolya Nagy Szabó[1], András Koleszár[1], Zoltán Dolhai[2]

[1] Product Design Institute, Rejtő Sándor Faculty of Light Industry and Environmental Engineering, Óbudai University, Budapest, HUNGARY
[2] Intrudair Ltd.

In this article, we present the development of sportswear for the ever-growing extreme BASE jumping and skydiving sports, from the clothing needs of beginners to professional competitors. Zoltán Dolhai, owner and managing director of Intrudair Ltd, manages a unique business in Hungary, manufacturing custom-made parachute and wingsuits for 25 years for skydivers all over the world. The research work was supported by the GINOP-2.1.2-8-1-1-4-16-2019-00901 grant, with the participation of colleagues from the Institute of Product Design of Óbuda University.

In this article, we describe the difficulties of custom manufacturing and the digital options that have been developed to solve the problems that arise.

The range of sportswear produced by the company is very wide, from parachute sports to wingsuits and their accessories, everything is made to measure.

The experience of freefalling and flying is not only possible by jumping out of a plane, there is also the possibility to practice jumping in a wind tunnel. Every circumstance requires a different type of clothing. The athlete needs to feel the flow of air over his body, whatever way he flies, as it helps him to feel how much force he needs to move his body parts, where he needs to put force by tensing his muscles to keep his balance. The choice of materials used to make the garments is very important, as they need to be made from fabrics with good strength properties as well as those with high elasticity.

Keywords: skydiving sportwear, formfitting clothes, custom made wind tunnel suits, custom made wing suits, dynamic movement

Corresponding address:
Orsolya Nagyné Szabó PHD
Product Design Institute
Rejtő Sándor Faculty of Light Industry and Environmental Engineering
Óbuda University
Doberdó u. 6, 1034 Budapest, Hungary
E-mail: szabo.orsolya@uni-obuda.hu

UPCYCLING AS A WAY OF PROMOTING CONSCIOUS CLOTHING CONSUMPTION

Oksana Vodzinska
Kyiv National University of Technology and Design, Kyiv, UKRAINE

The purpose of the work is to popularize conscious consumption of clothes among young people.

Methods are applied: analysis and synthesis - for the study of literary sources and Internet resources, generalization of information, development of classification; sketching method – for displaying sketches of products, including computer technologies; calculation and graphic (design methods) - for building product structures; practical - for cutting and making clothing models.

Results. The advantages of the creative transformation of old things and waste into new household products, clothes and accessories are:

- reduction of production waste and its impact on the environment;
- reduction of the amount of natural resources needed for recycling old clothes;
- avoiding the impact of harmful chemical substances of textile production on the environment, including climate change.

A classification of upcycling technologies for the production of new stylish product models was proposed:

- processing of denim products (pants, shirts, skirts, vests, jackets, etc.) using patchwork technology from denim of various shades, including children's clothing;
- production of knitwear and leather products using the method of tuning small leather elements on a knitted base;
- production of sewing products of smaller volumes and sizes (blouses, vests, shorts, mini-skirts) from products of large volumes and sizes (flare skirts, palazzo pants, skirts-trousers, etc.);
- production of one new product from several used ones with the addition of decoration (embroidery, drawing, etc.).

The design and manufacture of products were carried out within the scope of the scientific research work of the students and were covered in the subjects of the master's qualification works.

Keywords: upcycling technologies, conscious consumption, used clothes.

Corresponding address:
Oksana VODZINSKA
Faculty of Arts and Fashion
Kyiv National University of Technology and Design
2, Mala Shiyanovska Str.,
01011 Kyiv, Ukraine
E-mail: vodzinska.oi@knutd.com.ua

INFLUENCE OF TEMPERATURE BEHAVIOR ON THE PROPERTIES OF EMULSIONS OF MODIFIED FATLIQUORING MATERIALS

Antonina Zaiets, Olga Andreyeva
Kyiv National University of Technologies and Design, Kyiv, UKRAINE

In the leather industry, after the tanning process, the formation of the structure and such important properties of natural leather as strength, softness, elasticity, fullness, and the condition of the front surface occurs at the stage of dyeing and fatliquoring processes (the so-called “liquid finishing”), and, above all, during the process of fatliquoring. One of the most common fatliquoring methods is the emulsion method, which involves treating tanned and neutralized semi-finished leather products with water-fat emulsions. The effect of fatliquoring largely depends on the choice of fatliquoring materials and the stability of emulsions prepared on their basis. The purpose of this work was to study the properties of emulsions of modern commercial modified fatliquoring materials of natural and synthetic origin, intended for liquid finishing of leather, in heating/cooling mode in the temperature range 20-70°C/70-20°C. The droplet (particle) size and thermal behavior of the emulsions were determined using the DLS dynamic light scattering method using a Malvern Zetasizer Nano ZS analyzer (Malvern Instruments Ltd, Malvern UK) and SOP Player of Zetasizer Software 8.01.4906. The influence of temperature conditions and the type of fat used on the particle size and stability of 5% and 25% oil-water emulsions was experimentally established. The data obtained will be used in the future to explain the mechanism of interaction in the “collagen-chemical reagents” system, where fatliquoring materials will be used as the latter, as well as to create an innovative technology for liquid finishing of elastic leather using these materials.

Keywords: leather industry, modified fatliquoring material, emulsion, temperature behavior, properties

Corresponding address:
Olga ANDREYEVA
Department of biotechnology, leather and fur
Faculty of Chemical and Biopharmaceutical Technologies
Kyiv National University of Technologies and Design
Mala Shyianovska (Nemyrovycha-Danchenka) Street, 2
01011, Kyiv, Ukraine
E-mail: wayfarer14@ukr.net

WOMEN'S FASHION IN HUNGARY IN THE EARLY 19TH CENTURY, REFLECTED IN FASHION MAGAZINES

Péterné Korona, Virág Némethy

Product Design Institute, Rejtő Sándor Faculty of Light Industry and Environmental Engineering, Óbuda University, Budapest, HUNGARY

At the end of the 19th century and the beginning of the 20th century, one of the most significant literary, cultural, and fashion magazines was Magyar Bazár - *mint a nők munkaköre, a nőképző-, gazdasszony- és nőiparegylet hivatalos lapja.* It provided Hungarian upper-class women with the opportunity to follow the literary life of the era and featured high-quality fashion illustrations. The fashion illustrations followed the latest Parisian fashion trends, accompanied by detailed descriptions. The contemporary marketing was also noteworthy, as it included advertisements related to the topic. Researching magazines that were published twice a month provides us with valuable insights into the women's attire of that era.

Keywords: fashion paper, fashion magazines, fashion drawing, women's clothing, early 20th century

Corresponding address:
Péterné Korona, Virág Némethy
Product Design Institute
Rejtő Sándor Faculty of Light Industry and Environmental Engineering
Óbuda University
Doberdó út 6, 1034 Budapest, Hungary
E-mail: korona.magdolna@rkk.uni-obuda.hu, nemethy.virag@uni-obuda.hu

ANALYSIS OF THE LEVEL OF CONSUMER AWARENESS OF SUSTAINABLE FASHION AND TEXTILE MATERIALS

Valentina Bozoki, Ineta Nemeša, Marija Pešić, Nadiia Bukhonka

Technical faculty "Mihajlo Pupin", University of Novi Sad, SERBIA

Sustainable fashion has become a significant concept in the textile and fashion industry, widely influencing new fashion trends and also consumer behaviour. This paper deals with the analysis of consumers' knowledge about the concept of sustainable fashion, sustainable textile materials and garment manufacturing methods which support actual sustainable fashion concept. The survey was done amount 106 potential female and male garment consumers. The analysis showed that surveyed people have different shopping habits, they use to put attention to fabric content, quality of the purchased garments and their country of origin. More than half of respondents devote their unwanted garments to other people. However, they are weekly informed about fast fashion, slow fashion and sustainable fashion concepts and their shopping and garment wear habits are not based on the support of one of these actual business models. The results of survey showed that it is necessary to raise awareness of our population about current environmental problems created by textile industry and on bases of it to change garment shopping and wear habits supporting sustainable fashion concept.

Keywords: fast fashion, slow fashion, sustainable fashion, organic textile materials, shopping habits

Corresponding address:
Valentina Bozoki
Department of basic and applied sciences
Technical Faculty "Mihaljo Pupin"
University of Novi Sad
Đure Đakovića bb
23101, Zrenjanin, Serbia
E-mail: valentina.bozoki10@gmail.com

TEXTURES AND TEXTS – MATERIAL IMPRINTS OF HUMAN EXISTENCE IN LITERATURE

Edit Csanák

Product Design Institute, Rejtő Sándor Faculty of Light Industry and Environmental Engineering, Óbuda University, Budapest, HUNGARY

Traditionally, both clothing and architecture serve the human way of life. Textiles and architecture are connected straightforwardly and fundamentally. According to Plato, the Greek philosopher, *"Our first and greatest need to live at all, to exist, is to get food. (…) Our second need is housing; the third is clothing, and so on."* (Platón, 1988.) Textiles and fashion provide people with wearable clothes. Architecture provides a home for people to live in. Plato called weaving itself a "royal process," emphasising the importance of constructing clothing with balanced concern; the construction of clothing should be done with the same rigour and precision as the design of a building.

Although textiles, fashion and architecture are connected on several levels, and these areas mutually influence each other in terms of, for example, proportions, shapes, materials, colours, functions, and visual tools, this article does not focus on examining them and limiting itself to the discourse of textiles, highlighting that some exciting contemporary research has shed light on the presence of textiles in written sources and the diversity of descriptions related to textile making and dressing in literature. This study is in the early stages of research, and the investigation is not comprehensive; it is more like a teaser.

Keywords: textiles, clothing, weaving, sewing, embroidery, literature

Corresponding address:
Dr Edit CSANÁK
Product Design Institute
Rejtő Sándor Faculty of Light Industry and Environmental Engineering
Óbuda University
Doberdó str. 6
1034, Budapest, Hungary
E-mail: csanak.edit@rkk.uni-obuda.hu

FROM GRADING TO TAILOR-MAKING

Marianna Halász[1], Péter Tamás[2]

1 Institute for Industrial Product Design, Sándor Rejtő Faculty of Light Industry and Environmental Engineering, Óbuda University, Budapest

2 Department of Mechatronics, Optics, and Mechanical Engineering Informatics, Faculty of Mechanical Engineering, Budapest University of Technology and Economics, Budapest, HUNGARY

Computer systems' appearance significantly accelerated the ready-to-wear industry's production preparation process. At the Faculty of Mechanical Engineering of BME, we have been developing a computer-aided system for the clothing industry since 1985. We started the work by developing a Windows-based pattern gradation system. A special version of this was our software designing shirt patterns to individual sizes. We soon expanded the system with the cutting layout design module. Our software, named CAT for Windows (Computer-aided Textile for Windows), has spread in clothing industry vocational schools in Hungary.

Around the turn of the millennium, we began to deal with producing patterns to individual sizes. For this, an automatic system of body measurements became necessary. We built a body scanner named Sylvie 3D Body Scanner, which works with projected laser lines. The related software creates a 3D model of the examined person's body based on the scanned data and determines the individual body measurements required for cloth design. By projecting to the plane the 3D garment surface created on the 3D body model, we have developed a completely new method of making patterns to individual sizes.

The next task was the 3D virtual representation of the clothes on the 3D body model. For this, we have developed a particle drape model with special springs for modelling the mechanical behaviour of textile materials. The draping measurement is the only test that simultaneously characterises all material properties necessary for modelling. For precise measurement of draping, we built the Sylvie 3D Drape Tester based on the Sylvie 3D Body Scanner, which scans the shape of the draping fabric. Based on the scanned data, the software reconstructs the shape of the measured fabric. On the one hand, the software determines the usual parameters of draping, and on the other hand, this shape serves as a basis for the simulation of the fabric's behaviour. The presentation shows our developments for the clothing industry.

Keywords: clothing industry, computer-aided design, body scanner, draping measurement, body model, material simulation

Corresponding address:
Marianna Halász
Product Design Institute
Rejtő Sándor Faculty of Light Industry and Environmental Engineering
Óbuda University
Doberdó u. 6,
H-1034 Budapest, Hungary
E-mail: halasz.marianna@uni-obuda.hu

THE ART OF CREATIVITY, PRODUCT DESIGN, ENGINEERING AND ORIGAMI

László Koltai[1], Gabriella Oroszlány[2]

1 Faculty of Light Industry and Environmental Engineering
Media Technology and Light Industry Institute
2 Faculty of Light Industry and Environmental Engineering
Product Design Institute, Óbuda University, Budapest, HUNGARY

Creativity is one of the most important faculties of human thinking, a fundamental skill that allows us to think outside the box and come up with innovative ideas that can change the world.

Creativity is particularly important in product design, engineering, and any field where new and unique solutions are constantly needed to solve problems.

Creativity can be developed. One such development technique that has become increasingly popular in recent years is origami. Origami is the Japanese art of paper folding, which involves folding a single sheet of paper into different patterns and shapes. Not only is origami a fun and relaxing hobby, it is also a way to develop creativity. Making origami is a manipulation of materials.

This material manipulation can help research and development because it can be used to make models, prototypes, and designs in many areas of industry, be an excellent source of inspiration, and help develop new ways of solving problems.

This article describes the relationship, interconnection, and common intersections of these four areas - creativity, product design, engineering, and origami.

Keywords: creativity, product design, engineering, origami

Corresponding address:
Dr. László Koltai
Media Technology and Light Industry Institute
Rejtő Sándor Faculty of Light Industry and Environmental Engineering
Óbuda University
Doberdó u. 6, H-1034 Budapest, Hungary
E-mail: koltai.laszlo@uni-obuda.hu

STUDY OF THE APPLICATION OF ARTIFICIAL INTELLIGENCE TOGETHER WITH CAD PROGRAMS FOR THE DEVELOPMENT OF COLLECTIONS OF CLOTHING MODELS

Imiila Rysbaeva, Baktygul Turganbaeva, Gulida Kudakeeva

I. Razzakov Kyrgyz State Technical University (KSTU), Bishkek, KYRGYZSTAN

The latest developments in technology have made it possible to increase the level of education of a modern person. Today it is enough to have a smartphone with the Internet and engage in self-education, which allows you to develop your skills and broaden the horizons of a specialist.

Currently, curriculum contributes to the creation of in-demand professions, which are further implemented in the educational process, where the application of AI and IT technologies is tasked.

As we know, many brands no longer need to update their collections of clothing models every season, as before, for several weeks, so designers have to act very quickly, while maintaining originality and special style. Working with neural networks and artificial intelligence, a fashion designer can use their creative imagination to speed up and simplify their work.

Artificial intelligence empowers and optimizes the fashion industry: it recognizes clothes from photos, accesses virtual fitting sessions, and, without much effort, easily selects the perfect size. The program will automatically design the pattern and technically reproduce the patterns by size, height and fullness. Artificial intelligence will require less creative work from the author, and designers themselves will be able to devote more time to their creativity.

The research paper uses Midjourney AI to make it easier to create new designs for clothing models. An artificial intelligence can be used to create images, solve problems and get new ideas. With the help of this program, it is supposed to create an experimental series of Kyrgyz national costumes, the details of which will be designed in the graphic program of the clothing designer Grafic 12.

Keywords: Artificial intelligence, neural networks, design, products, creating, clothing collection, clothing construction.

Corresponding address:
Akimjanovna Imiila Rysbaeva - imiyla@kstu.kg,
Taalaybekovna Baktygul Turganbaeva - turganbaeva.b@inbox.ru
Department of Technology of Light Industry Products
Institute of Technology
I.Razzakov Kyrgyz State Technical University (KSTU)
Madanbekovna Gulida Kudakeeva - kgm@kstu.kg
Department of Automation and control, Institute of Information Technologies,
I.Razzakov Kyrgyz State Technical University (KSTU)
66, Ch. Aitmatov Avenue, Bishkek 720044, Kyrgyzstan

THE INFLUENCE OF SIGN-CHANGING TEMPERATURES DURING OPERATION ON THE PHYSICAL AND MECHANICAL PROPERTIES OF NATURAL LEATHER

Oksana Mykhailovska, Tetiana Nadopta
Khmelnytskyi National University, Khmelnytskyi, UKRAINE

Special footwear for military personnel must fully comply with quality indicators and operating conditions. In particular, this applies to products for the autumn-winter season. The behavior of materials at low temperatures is critical to ensure their functionality, especially in cold climates. This is relevant for natural leathers, which are widely used for the manufacture of insulated special shoes, because they can lose flexibility, elasticity and strength at low temperatures, which can lead to a decrease in the performance characteristics of special shoes for military personnel.

The nature of changes in the properties of natural leather of different degrees of hydration at low temperatures and under the cyclic influence of "freezing-thawing" has not been sufficiently studied.

Considering the above, a methodology for researching the cyclic effect of "freezing-thawing" on natural leather was proposed, which included a sign-changing temperature treatment of leather samples, followed by a study of their physical and mechanical properties under uniaxial stretching, and resistance to multiple bending.

For the research 200 samples were cut from the central part of the heifer of the chrome tanning method with a face coating.

As a result, a decrease in the physical and mechanical properties of natural leather (the heifer of the chrome tanning method), which has previously endured the cyclic effect of "freezing-thaw" action, was established, depending on the number of exposure cycles.

Therefore, when designing and developing a technology for the production of special footwear for military personnel, it is necessary to take into account the operating conditions and the influence of sign-changing temperatures on the properties of the material.

Keywords: temperature treatment, freezing-thawing, multiple bending, physical and mechanical properties, leather resistance.

Corresponding address:
Ph.D. Oksana Mykhailovska,
Department of fashion industry in light industry
Faculty of Technology and Design
Khmelnytskyi National University, 11, Instytuts'ka str., Khmelnytskyi, 29016, Ukraine
E-mail: centr@khmnu.edu.ua, nauka@khmnu.edu.ua

TYPES OF INTERLININGS USED MANUFACTURING MEN JACKET

Ineta Nemeša, Marija Pešić, Nadiia Bukhonka, Valentina Bozoki

Technical faculty "Mihajlo Pupin", University of Novi Sad, SERBIA

Interlining is a layer of woven, non-woven or knitted fabric inserted between the outer fabric and the lining of a jacket to give a suitable 3D shape and stability to its parts. Different kind of canvas and fusible interlinings are used manufacturing a men suit. Fusible interlining can be created from different origin and qualities base material and adhesive substances applied to it. Special fusing presses are used to fix fusible interlining to separate parts of a jacket. The woven canvas interlinings are machine stitched to outer fabric of a jacket. There is great variety of canvas interlinings which differ in material, qualities, weights and degrees of stiffness. Blindstitch padding machines are used to fix them on the outer material components of a jacket. The machine stitching allows canvas interlining to move/"float" a little in between the outer fabric and the lining. The fusible interlining is glued to outer fabric and cannot move. Both kinds of interlinings have their advantages and disadvantages manufacturing and wearing classical men jacket.

Keywords: garment finishing, final pressing, steam finishers, finishing tunnels, shaping presses

Corresponding address:
Ineta Nemeša
Department of basic and applied sciences
Technical Faculty "Mihaljo Pupin"
University of Novi Sad
Đure Đakovića bb, 23101, Zrenjanin, Serbia
E-mail: inetavil@gmail.com

EVALUATING OF THE EFFECTIVENESS OF DIGITAL CLOTHING IN ONLINE CUSTOMIZATION SYSTEMS

Mykola Riabchykov[1], Viktoriia Mytsa[2]

[1] Lutsk National Technical University

[2] Khmelnytskyi National University, Khmelnytskyi, UKRAINE

Internet customization of clothes involves the active participation of the consumer in the creation of individual clothes for the purpose of their manufacture and use. Existing models of customization do not fully satisfy consumers in the case of production of ready-made products without fitting. The paper proves the feasibility and effectiveness of implementing blocks of digital clothing in the model of customization systems. The developed model resolves the contradiction between the modern possibilities of digital clothing and the difficulties of its implementation by means of digitization of the image, real display online or in virtual fitting rooms. The model of with application of virtual fitting rooms is proposed. An analysis of the conformity of the real product to its three-dimensional image and individual image in the virtual fitting room was made. A survey of potential customers of customization using digital clothing systems and interviews with manufacturers and organizers of online clothing stores were conducted. Statistical analysis of the results using Cronbach's alpha showed a high importance of issues related to the adoption of digital clothing. A comparison of the consumer and material efficiency of online digital clothing and digital clothing in virtual fitting rooms demonstrates the feasibility of implementing processes related to digital clothing into online customization systems.

Keywords: digital clothing, Internet customization, virtual fitting room

Corresponding address:
Viktoriia MYTSA
Department of Garment Technology and Design
Faculty of Technology and Design
Khmelnytskyi National University
11, Instytuts'ka str.
29016, Khmelnytskyi, Ukraine
E-mail: mitsa_vv@ukr.net

WORKSHOP ON ENVIRONMENTAL SCIENCES AND ENGINEERING (WESE)

ORAL PRESENTATIONS

ENVIRONMENTAL RESISTOME: ESKAPE PATHOGENS AND RISKS TO HUMAN HEALTH

Lyudmyla Symochko[1,2,3]

1 University of Coimbra, Coimbra, PORTUGAL
2 Uzhhorod National University, Uzhhorod, UKRAINE
3 Institute of Agroecology and Environmental Management, Kyiv, UKRAINE

Assessing the risks posed by the environmental resistome has become a pressing concern. Human actions significantly influence the environmental resistome, fostering the emergence of antibiotic resistance (AMR) in ecosystems. This recognition has spurred the "One-Health" approach, a holistic strategy to unravel AMR's complex web in human, animal, and environmental contexts. At the epicenter of this challenge is the ESKAPE group, these pathogens stand out due to their remarkable resistance to common antibiotics like penicillin and vancomycin, posing a grave threat to human health. From 2016 to 2021, extensive monitoring across various ecosystems, including water and soil ecosystems revealed an alarming trend. The prevalence of ESKAPE pathogens surged. In the water ecosystem, their numbers increased by 1.65-fold (from n=35 to n=58), and in agroecosystems by 2.21-times (from n=73 to n=162). In these environments, the water harbored highly antibiotic-resistant *Klebsiella pneumoniae, Enterococcus faecalis*, and *Enterococcus faecium*. Soil samples from agricultural ecosystems contained *Pseudomonas aeruginosa, Enterococcus faecium, Enterococcus faecalis, Staphylococcus aureus*, and *Acinetobacter baumannii*. This underscores the urgent need for vigilance and intervention against the escalating risks posed by the environmental resistome to human health.

Keywords: ecosystem, resistome, pathogens, soil, water.

Corresponding address:
Lyudmyla Symochko
Email: lyudmilassem@gmail.com

CORRELATIONS BETWEEN ECONOMIC GROWTH AND CARBON EMISSION IN SELECTED COUNTRIES BETWEEN 1990 AND 2021

Sándor J. Zsarnóczai

Institute of Environmental Engineering, Rejtő Sándor Faculty of Light Industry and Environmental Engineering, Óbuda University, Budapest, HUNGARY

Recently because of the global warming resulted by mostly carbon-dioxide gas emission based on the human activity, therefore the mitigating gas emission became important by global cooperation of countries. In the period of 1990 and 2021 the study analyses the volume of carbon-dioxide emission and its corelations with economic features of selected economies, which have significant role in field of gas emission and mitigating gas emission. The economic features of United States, the United Kingdom, Japan, Russia, Germany, France, Italy, China, India, Iran, Saudi Arabia, Sweden, Hungary, Poland, Austria, Turkey, Brazil and Egypt are included in the analyse. The research method is based on the statistical program for social sciences (SPSS). China has share by 32.9% in global carbon-dioxide emission, while the United States has share by 12.6% and the EU-27 has share by 7.3% and India has share by 7.0% in the same time 2021. The study proofs that the total investment in 2021 has strong correlations with CO2 emissions Mt CO2/year, in 2021 and CO2 emissions per capita ton CO2/cap/year, in 2021.

Also study proofs that CO2 emissions Mt CO2/year, in 2021 comparably to 1990 has strong correlations with CO2 emissions per capita ton CO2/cap/year, in 2021 and growth of populations for the period of 2021 and 1990. The solution for the mitigating carbon-dioxide emission is to develop advanced green environment friendly technology for using renewable energy resources.

Keywords: economic variables, global warming, green technology, investment, renewable energy

Corresponding address:
Sándor J. Zsarnóczai
Associate professor Dr., CSc, Habil
Institute of Environmental Engineering
Rejtő Sándor Faculty of Light Industry and Environmental Engineering
Óbuda University
Doberdó u. 6, H-1034 Budapest, Hungary
Email: zsarnoczaisandorjozsef@gmail.com

QUALITY SERVICE - THE HEART OF QUALITOLOGY

Tamás Csiszér

Institute of Media Technology and Light Industry, Rejtő Sándor Faculty of Light Industry and Environmental Engineering, Óbuda University, Budapest, HUNGARY

Traditional Quality Science and Engineering, also known as Qualitology, focuses on the ability of organizations, processes, and products to meet stakeholder requirements. There have been lots of tools and techniques developed, helping professionals mainly in their quality development programs. Related skills and knowledge have been built into the general competence set of employees, and quality focus has become an important aspect of strategic-level decisions. Meanwhile, an essential part of quality science seems to be vanishing: the service orientation, the aim to help each other improve on individual and organizational levels, too. This paper summarizes the essential elements of the so-called Quality Service approach, including a deep comparison with Quality Checking, Controlling, Assurance, and Management, and combining it with a network-based quality engineering perspective.

Keywords: quality science and engineering, network science, service orientation

Corresponding address:
Dr. Tamás CSISZÉR
Institute of Media Technology and Light Industry
Rejtő Sándor Faculty of Light Industry and Environmental Engineering
Óbuda University
96/B Bécsi út, 1034, Budapest, Hungary
E-mail: csiszer.tamas@uni-obuda.hu

ASSESSMENT OF IMPACTS OF GLOBAL CLIMATE CHANGE ON HUMAN HEALTH

Hosam E.A.F. Bayoumi Hamuda

Institute of Environmental Engineering and Natural Sciences, Rejto Sandor Faculty of Light Industry and Environmental Engineering, Óbuda University, Budapest, HUNGARY

Global climate change is directly affects the main environmental components: water, air, weather, and ecosystems. Changes in precipitation, temperatures, and melting of ice caps are already occurred and will create new changes in the availability and quality of environmental elements and the human health. The purpose of this discussion is to understand the impacts of global climate change on human health and how the world manages both mitigate and adapt of climatic changes on the biosphere. Also, it is organized around the categories of human health consequences of global climate change such as asthma, respiratory allergies, air quality diseases, cancer, cardiovascular disease and stroke, food-, water-borne, vector- borne and zoonotic diseases, nutrition, weather and heat-related morbidity and mortality, human developmental impacts, mental health and stress-related disorders, neurological diseases and disorders, etc. These risks give early warnings and greater public awareness of population's health risk from global climate change, which should translate into more successful mitigation and adaptation strategies. Today, human community need a coordinated global approach will bring the unique skills, capacities, and missions of the various agencies together to maximize the potential for discovery of new information and opportunities for success in providing key information to support responsive and effective decisions on climate change and health.

Keywords: global climate changes, public health, environmental and human health

Corresponding address:
Prof. Dr. habil. Hosam E.A.F. BAYOUMI HAMUDA
Institute of Environmental Engineering and Natural Sciences
Rejto Sandor Faculty of Light Industry and Environmental Engineering
Obuda University
Doberdo Str. 6
H-1034, Budapest, Hungary
E-mail: bayoumi.hosam@uni-obuda.hu
Mobil: WhatsApp/viber/messenger: +36303900813

WORKSHOP ON ENVIRONMENTAL SCIENCES AND ENGINEERING (WESE)

POSTER PRESENTATIONS

CONTAMINATION OF AGRICULTURAL CROP PLANTING MATERIAL WITH WEED SEEDS

Olga Kichigina, Lilia Havryliuk

Institute of Agroecology and Environmental Management of NAAS, Kyiv, UKRAINE

In order to assess the suitability of seed lots for planting, we conducted an analysis of 785 samples of agricultural crop seeds from 2017 to 2022. The analysis involved determining the percentage of pure seeds of the main crop by weight and the content of impurities, including seeds of other species: cultivated and weeds (seeds per kg). The analysis followed the methods outlined in DSTU 4138-2002 and complied with the quality standards set forth in DSTU 2240-93. The Latin names of weeds were cross-referenced with Euro+Med (2006-): Euro+Med PlantBase, an information resource for Euro-Mediterranean plant diversity, available online at http://ww2.bgbm.org/EuroPlusMed/. As a result of the analysis, seeds of 26 weed species were identified. Among them, quarantine weeds included: *Ambrosia artemisiifolia* L.; noxious and most harmful weeds: *Convolvulus arvensis* L., *Avena fatua* L., *Polygonum maculosa* Gray., *Polygonum convolvulus* L., *Galium aparine* L., *Euphorbia virgate* Waldst. & Kit., *Xanthium strumarium* L., *Amaranthus retroflexus* L.; and hard-to-separate weeds: *Melilotus officinalis* (L.) Paal., *(Echinochloa crusgalli* L.) Beauv., *Anchusa arvensis* (L.) M.BIEB., *Capsella bursa-pastoris* L., *Vicia cracca* L., *Galeopsis tetrahit* L., *Taraxacum officinale* Wigg., *Chenopodium album* L., *Arctium lappa* L., *Euphorbia helioscopia* L., *Daucus carota* L., *Setaria pumila* (Poir.) Roem. & Schult., *Raphanus raphanistrum* L., *Echium vulgare* L., *Silene vulgaris* (Moench) Garcke, *Thlaspi arvense* L., *Rumex confertus* Willd. L. For seed lots where the content of weed seeds exceeds the standards set by the State Standard, it is recommended to conduct cleaning.

Keywords: weed seeds, planting material, purity, impurities.

Corresponding address:
Olga Kichigina
Candidate of Agricultural Sciences, Senior Researcher
Independent Seed Ecology Laboratory, Institute of Agroecology
and Environmental Management of NAAS
12 Metrolohichna Str. 03143, Kyiv, Ukraine
E-mail: seednlen@ukr.net

MULTI-CRITERIA DECISION-MAKING METHODS AS A TOOL FOR IMPROVING THE WASTE MANAGEMENT SYSTEM IN DEVELOPING COUNTRIES – A SHORT REVIEW

Una Marceta, Bogdana Vujić, Visnja Mihajlović

University of Novi Sad, Technical Faculty “Mihajlo Pupin”, Zrenjanin, Serbia

The waste management system in developing countries, as well as in all low-income countries, is undeveloped, includes collection and depositing of waste, which causes negative environmental impact. This practice has led to the existence of many unsanitary landfills, and the implementation of measures leading to remediation and rehabilitation requires high financial investments, and developing countries are not able to solve all problems at once, but it is necessary to establish a list of priorities. On the other hand, when designing new landfills, it is of high importance to identify the most optimal location so that negative impacts on the environment and the population are reduced. In this paper, the research was done through a preliminary review of the literature in which the application of multi-criteria decision-making methods (MCDM) in the field of waste management was analyzed. The models and methods of application of MCDM methods analyzed in previous research confirm the possibility of their application in order to improve the waste management system in developing countries.

Keywords: landfill, multi-criteria decision-making, environmental protection, solid waste, human health

Corresponding address:
Dr Una MARCETA
Department of Environmental Engineering
Technical Faculty Mihajlo Pupin
University of Novi Sad
Djure Djakovica bb
23000 Zrenjanin, Serbia
E-mail: una.tasovac@tfzr.rs

SELECTED POSTERS

This selection contains the posters carefully chosen by the Scientific Committee. The posters has been selected based on their visual-informative and aesthetical features, and arrangement of the scientific content.

ADSORPTION MECHANISM OF MAGENTA FLEXOGRAPHIC PRINTING DYE ON ACTIVATED CARBON

Vesna Gvoić[1], Saša Petrović[1], Živko Pavlović[1], Gordana Bošnjaković[1], Miljana Prica[1]

[1]University of Novi Sad, Faculty of Technical Sciences, Department of Graphic Engineering and Design, Novi Sad, Serbia

e-mail: kecic@uns.ac.rs, petrovic.sasa@uns.ac.rs, zivkopvl@uns.ac.rs, gordana.delic@uns.ac.rs, miljana@uns.ac.rs

1. Introduction

Since printing dyes are characterized by high water solubility, a significant proportion of them end up in wastewater. Colored printing wastewaters are characterized by high pH and temperature values, high conductivity, high suspended solids content, high total organic carbon, high chemical oxygen demand (COD), low biological oxygen demand (BOD), and low COD/BOD ratio, indicating high content of non-biodegradable organic substances in the wastewater. Due to numerous harmful effects, they can cause various health problems for humans and for aquatic ecosystem. Therefore, the removal of dyes from printing wastewater is extremely important before it is discharged into the environment.

The aim of this work is to optimize the adsorption process and investigate the adsorption mechanism of Magenta flexographic printing azo dye (in synthetic solution and real wastewater) on commercial activated carbon. Commercial activated carbon was used as the adsorbent, and Magenta dye wastewater was obtained after the flexographic printing process.

2. Experimental

2.1. Materials and Chemicals

The following chemicals were used in the experimental part: Activated carbon (AC, Norit Row 0.8 Supra), Magenta flexographic printing dye (Flint), sodium hydroxide (> 98.8% POCH, Poland) and hydrochloric acid (> 96%, J.T. Baker) - Fischer Scientific, USA).

Commercial activated carbon was used as adsorbent and its physical and chemical properties are following: iodine number (1050 mg/g); specific area (1150 m^2/g); ash content (7 %), moisture content (2 %); pH 4,6; density (390 kg/m^3).

The basic properties of the Magenta printing dye are (Figure 1): dye index (PR57:1), CAS number (5281-4-9), chemical formula ($C_{18}H_{12}N_2O_6$), molecular weight (352 g/mol), λmax (573 nm).

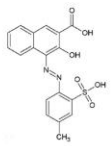


Figure 1. Chemical structure of Magenta dye

2.2. Experiment Design

In order to optimize the experiment and to study the influence of process parameters on the adsorption treatment process and its effectiveness, the statistical method Definitive Screening Design (DSD) was used. DSD analysis was used to study the influence of four process parameters: initial dye concentrations (20 - 180 mg/L), adsorbent mass (0.01 - 0.1 g), pH (2 - 10) and reaction time (1 - 60 min). For the four numerical factors, the JMP 13 software produced a table of 13 experiments and two central points. Optimization of adsorption treatment using the DSD statistical method by selecting a combination of process parameters allows the achievement of the highest decolorization efficiency of treated samples.

2.3. Evaluation of the adsorption treatment effectiveness in the removal of synthetic dyes

The adsorption experiments and the treatment of real printing wastewater were performed under batch conditions of the system, where activated carbon of a certain mass (0.01 - 0.1 g) was added to a 50 mL sample volume of a synthetic dye solution within certain concentration (20 - 180 mg/L) or printing wastewater (88.56 mg/L), while the pH of the reaction medium (2 - 10) was adjusted by adding HCl or NaOH (0.1 M). The reaction mixture was mixed on a rotary shaker (IKA, KS 130) for the indicated time (1 - 60 min) at a speed of 240 rpm and an ambient temperature of 23 °C. The samples were filtered through a cellulose acetate membrane filter with a porosity of 0.45 mm and the equilibrium dye concentration was determined using a UV/VIS spectrophotometer (Genesys 10S, Thermo Fisher). The adsorption treatment efficiency was monitored by evaluating the dye removal from the synthetic solution and the real wastewater based on the following formula:

$$E(\%) = ((A_0 - A)/A_0) * 100$$

where: A_0 - the initial absorbance of the aqueous synthetic solution and real wastewater, and A - the absorbance of the solution after the adsorption treatment.

2.4. Adsorption isotherms

The adsorption mechanism of Magenta printing dye on activated carbon was determined based on adsorption isotherm experiments. Seven different initial dye concentrations were used (1, 5, 25, 50, 100, 150 and 200 mg/L), with a constant adsorbent mass of 0.1 g. The equilibrium concentration of the dye was determined using a UV/VIS spectrophotometer (Genesys 10S, Thermo Fisher). The obtained results were modeled using the Freundlich and Langmuire models.

3. Results and Discussion

3.1. DSD optimization and real effluent treatment

Table 1 shows the DSD experiment design and removal efficiency of Magenta dye from the synthetic solution, where the efficiency range of the adsorption treatment was found to be 13.19 - 95.71%.

Table 1. DSD experiment design with removal efficiency of adsorption porcess

Sample	Dye concentration (mg/L)	Adsorbent mass (g)	pH	Time (min)	Removal efficiency (%)
1	100	0.1	10	60	68.06
2	100	0.01	2	1	92.36
3	180	0.055	2	60	88.80
4	20	0.055	10	1	47.14
5	180	0.01	6	1	17.05
6	20	0.1	6	60	30.00
7	180	0.1	2	30.5	95.29
8	20	0.01	10	30.5	34.29
9	180	0.1	10	1	27.27
10	20	0.01	2	60	95.71
11	180	0.01	10	60	36.04
12	20	0.1	2	1	81.43
13	100	0.055	6	30.5	13.19
14	100	0.055	6	30.5	16.32
15	100	0.055	6	30.5	17.36

The optimization diagram shown in Figure 2 gives a clear insight into how the adsorption process efficiency changes as a function of one variable, while the other variables remain constant. In this way, the highest efficiency of the applied treatment of 98% was proposed to remove the Magenta dye under optimal process conditions: dye concentration 20 mg/L, adsorbent mass of 0.1 g, pH 2.4 and reaction time 60 min. The optimization diagram clearly shows the pronounced influence of pH, reaction time and mass of adsorbent on the performance of the adsorption process. At the same time, it was found that the change of dye concentration has the least influence on the change of adsorption process efficiency.

In order to determine the possibility of using the optimized adsorption treatment, the real wastewater obtained after the printing process was subjected to the same treatment at the determined optimal values of the process parameters adsorbent mass 0.1 g, pH 2.4 and reaction time 60 min). The highest decolorization efficiency of 68% was achieved at the 75. minute of the reaction (Figure 3), confirming the lower activity of the activated carbon in the treatment of the real wastewater compared to the synthetic solution.

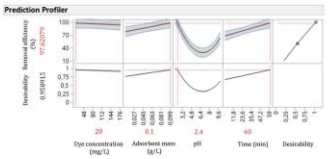


Figure 2. Optimization diagram

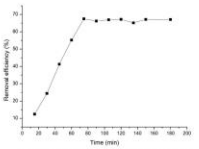


Figure 3. Treatment efficiency of real printing effluent

3.2. Adsorption mechanism

The adsorption mechanism of the printing dye on activated carbon was studied using the Freundlich and Langmuire models. By comparing the correlation coefficients (Table 2), it was found that the adsorption of printing dye on activated carbon is best described by the Langmuire model (R^2 = 0.999). The good agreement with the Langmuire model indicates that there are chemical interactions in the activated carbon/dye system, i.e., that chemisorption occurs, primarily due to the presence of numerous functional groups on the surface of the activated carbon that have a high affinity for the dye. At the same time, at high dye concentrations in the solution, the surface of the activated carbon becomes saturated and adsorption ends with the formation of a monolayer of adsorbed particles.

Table 2. Adsorption isotherms constant values

Adsorption isotherm model	Adsorpion isotherms constant values	
Freundlich	R	0.987
	K_F	2.353
	n_F	0.656
Langmuir	R	0.999
	Q_{max}	93.460
	K_L	0.029

4. Conclusion

Results show that the mass of adsorbent, pH, and reaction time are the parameters that contributed most to the efficiency of removing Magenta dye from the synthetic solution. In addition, the adsorption treatment resulted in 98% and 68% efficiency in removing the printing dye from the synthetic solution and real wastewater, respectively. The adsorption of printing dye on activated carbon was found to be best described by the Langmuire model, indicating the presence of chemical interactions in the activated carbon/printing dye system, i.e., the chemisorption mechanism was confirmed as a result of the presence of numerous functional groups on the surface of activated carbon, which have a high affinity for dyes.

Innovative multipurpose gift packaging

Andreja Pogačar, Diana Gregor-Svetec
University of Ljubljana, Faculty of Natural Sciences and Engineering, Snežniška 5, Ljubljana, Slovenija

andreja@dodopack.com
diana.gregor@ntf.uni-lj.si

9th International Joint Conference on Environmental and Light Industry Technologies, 10th of November 2023

The legislation and shift in consumer behavior have placed eco-design at the forefront of packaging trends. Packaging eco-design is the process of designing packaging sustainably. Actions such as redesigning to use less packaging material, employing sustainable, renewable, plant-based, or recycled materials are applied. Innovative design approaches to optimize packaging efficiency and create reusable or multipurpose packaging are important steps toward sustainable packaging, in addition to using eco-friendly materials.

The objective of our research was to design sustainable, multipurpose gift packaging. Packaging made from corrugated cardboard was designed not only to attract consumers with its unique shape, which conveys the brand's comprehensive image through the packaging's form rather than through graphic design but also to underscore that unique packaging shapes can make a brand recognizable even when graphic design plays a secondary role. Elements of multifunctionality and the potential for reusing the packaging were incorporated. By adding a handle to avoid the need for a gift bag and constructing it to allow for the storage of various products, the packaging's multifunctionality was enhanced. An exhibition product display that can be assembled from several packaging units, serving as an alternative to a promotional stand, is another multipurpose feature of the packaging. After serving its initial purpose, the packaging can transform into a nesting box for solitary bees, allowing for the repurposing of the material. The substance that attracts bees was tested to achieve the right consistency for screen printing. The stability of the packaging was also tested. Finally, a survey provided insights into consumer perceptions of the enhancement of sustainable packaging through various multifunctional features.

Multi-functionality

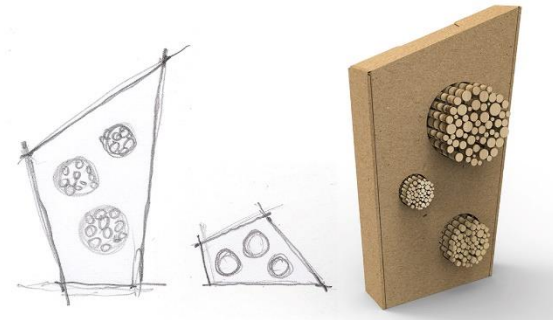
To eliminate the need for an additional gift bag for the packaging, we designed a **handle** from corrugated cardboard that is easily inserted into the packaging without any need of adhesive. The packaging is designed to pack a variety of different products. This design evolves from the fact that **versatility** is an important feature when the packaging is intended for various products. Although the packaging was originally designed for two bottles of spirits, the insert made from a folding boxboard can be simply removed, thus providing enough space to package other products that fit within the packaging's volume. The third function arises from the unique shape of the packaging. We designed various packages for a **promotional display**, all sharing the same construction elements and using the same material (corrugated cardboard). The difference lies in the dimensions, volume, and inclination of the sides, allowing them to be tailored to completely different products. The goal was to assemble a promotional display, in our case, a silhouette of the Julian Alps, using multiple different packages without printing. The arrangement of the packages is adapted based on the available sales space and the packages at hand.

Reuse

We adapted the packaging so that it can be transformed into a nesting box for solitary bees with a few simple steps. To entice bees into the nesting box, an attractant is necessary. Pollen can be used for this purpose. To apply the pollen to the packaging, we prepared various suspensions of water, sugar syrup, and pollen in different states (whole grains, crushed grains, powder). We tested all combinations with varying amounts of ingredients, more or less water, sugar and pollen. We applied the mixtures to the corrugated cardboard and observed the drying process. When a larger amount of water was present, the wetting and absorption were too great. The mixtures with a higher dry part, i.e., pollen, dried the quickest. The wetting was suitable, and the absorption was not too high, allowing the pollen to remain attached to the surface. The most optimal mixture, especially for screen printing application, was a combination of pollen and sugar syrup (less water for rapid drying and good adhesion to the surface). Once the mixtures dried completely, the surface was hard and non-sticky.

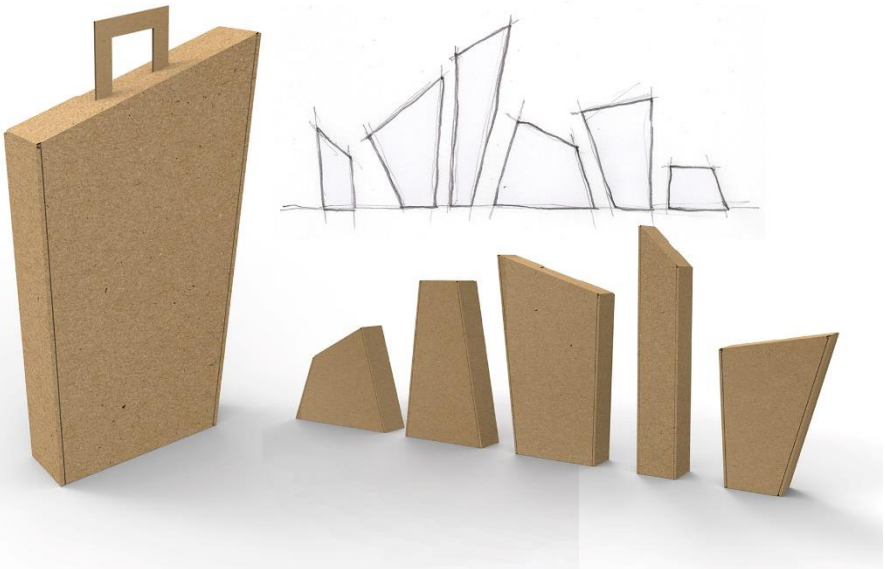
We prepared three **different concentrations** of sugar syrup. The sugar syrup with the most sugar crystallized even before testing, making the sample unsuitable for further use. We conducted measurements on two solutions. Solution B, with its viscosity of approximately 2,700 mPa.s, had a significantly higher viscosity than solution A (mPa.s).

For screen printing, we used both sugar syrup solutions (A and B). We added an equal amount of powdered pollen to each liquid, mixed well, and printed onto the cardboard. Solution B, which was more viscous, applied more nicely and evenly with screen printing and dried faster, as earlier tests showed that mixtures with less water dried better and faster.



Solution	Syrup composition		Spindle mark / Spindle factor (f)	Speed (RPM)	[%] Area	VISCOSITY [mPa.s]
	Water	Sugar				
A	43%	57%	RV-02	20	1,6	32,0
				50	6,4	51,5
				100	17,5	70,0
B	23%	77%	RV-05	20	13,7	2.680,0
				50	34,2	2.736,0
				100	68,0	2.718,7
C	12%	88%	testing was not possible due to crystallization			

Left: Sugar syrup solutions with powdered pollen printed on cardboard with screen printing
Right: Seven testing combinations with varying amounts of ingredients, more or less water, sugar, and pollen



ÓBUDAI EGYETEM
ÓBUDA UNIVERSITY

9th International Joint Conference on Environmental and Light Industry Technologies
10 November 2023, Budapest, Hungary - online
Óbuda University

IJCELIT 2023

WOMEN'S FASHION IN HUNGARY IN THE EARLY 19TH CENTURY, REFLECTED IN FASHION MAGAZINES

MAGYAR BAZÁR- MINT A NŐK MUNKAKÖRE, A NŐKÉPZŐ-, GAZDASSZONY- ÉS NŐIPAREGYLET HIVATALOS LAPJA

KORONA PÉTERNÉ / NÉMETHY VIRÁG
INSTITUTE OF PRODUCT DESIGN / ÓBUDA UNIVERSITY / E-MAIL: KORONA.MAGDOLNA@RKK.UNI-OBUDA.HU / NEMETHY.VIRAG@UNI-OBUDA.HU

The Compromise of 1867 established a constitutional monarchy based on the principle of parity, granting Hungary significant autonomy in both political and economic matters compared to the preceding period. The era of the Austro-Hungarian Monarchy was characterized by significant economic and cultural development, which was evident in the everyday lives of the people. During this time of peace, the aristocracy, affluent middle class, and the bourgeoisie all strengthened their positions. By the turn of the century, in addition to the rural elite in manors, the city of Budapest, now unified under its name, became the bustling center of literary, cultural, and social life.

Budapest's rapid development manifested in all aspects of life, and fashion also sought to follow European trends, particularly Parisian fashion. While the wealthiest magnates participated in high-society events in London, Paris, Rome, and Vienna, not everyone had the opportunity to stay informed about lifestyle changes and new clothing trends abroad. The fashion magazines of the time provided this opportunity for "ladies of high society."

In 1873, the „Magyar Bazár, mint a Nők Munkaköre" was created through the merger of two publications. It was closely associated with the Wohl sisters, Janka Wohl (1846-1901) and Stefánia Wohl (1848-1889) for many years. This fashion magazine, published twice a month, not only focused on clothing but also provided guidance in literary and social matters in line with the spirit of the era. The Wohl sisters excelled not only in journalism but also in literature.

1. image:Ball gowns

2. image:Reform-style ball gown

Literary sources:

1.F. Dósa Katalin: Pesti nők a századfordulón, 1991. március 20. – aug 20. kiállítás ISBN 963-7421459
2. Mészáros Zsolt: A Wohl-nővérek nemzetközi fogalmatásáról transzmediális kontextusban, Helikon - 63. évf. 3. sz. (2017.)
3. Magyar Bazár, mint a Nők Munkaköre, 1903. január 16.
4. Magyar Bazár, mint a Nők Munkaköre, 1902. december 16.
5. Magyar Bazár, mint a Nők Munkaköre, 1902. szeptember 1.
6. Magyar Bazár, mint a Nők Munkaköre, 1902. augusztus 16.
7. Magyar Bazár, mint a Nők Munkaköre, 1903. március 16.
8. Magyar Bazár, mint a Nők Munkaköre, 1903. május 16.
9. Magyar Bazár, mint a Nők Munkaköre, 1903. július 16.
10. Magyar Bazár, mint a Nők Munkaköre, 1902. március 1.
Magyar Bazár, mint a Nők Munkaköre, 1903. június 1.

The literary quality of the magazine was guaranteed by their personal friendships with Hungarian literary figures such as Arany János and Jókai Mór, who also supported the publication.

After the death of Janka Wohl in 1901, the magazine was edited by S. Hentaller Elma and Mrs. Sándorné Lónyai until the end of 1904.

This study focuses on the fashion sections, which, like the literary supplements, were also of high quality. The „Magyar Bazár, mint a Nők Munkaköre", not only provided a general overview of fashion changes but also offered guidance related to the current events of the seasons. The most important message in the January issues was the beginning of the ball season. For this highly significant social event, elegant attire was prepared for the ladies. In the issue dated January 16, 1903, clothing recommendations, complete with descriptions, were mainly aimed at young women. (Image 1) The colors of the dresses were white, light blue, or other pale pastel colors. The materials used were tulle, lightweight silk, silk muslin, and "crêpe de Chine." These noble and silk-shiny, softly flowing fabrics were richly decorated with lace and other soft ruffles, silk ribbons, and it was emphasized which dress was recommended for tall, slim ladies.

The fashion illustrations mostly depicted the dresses on tall, slim women. The corset was still in use, which is why you can see unrealistically narrow representations of women's waists. However, they also featured dresses for less slender ladies, including an "Elegant Reform Attire" with an embroidered shawl. (Image 2)

Outdoor entertainment was also available during the winter. This is evidenced by the presentation of the ice-skating ladies. In today's terms, we can't expect sportswear as we know it, but they differ from regular street clothes in that they are tighter and shorter, with the use of thicker winter fabrics and fur as decorative elements. Sport and physical activity became a new fashion trend, and women also had the opportunity to try it. Horseback riding was accepted for women previously, but the fashion of the attire changed. The equestrian outfit depicted in Image 3 was made with an English skirt and a long coat.

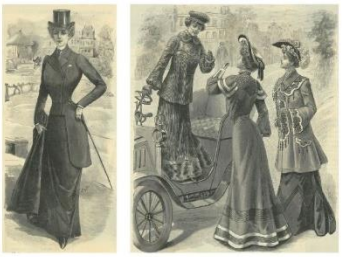
The spring and summer issues naturally featured illustrations of clothing suitable for the weather and leisure activities, catering to the readers. In addition to women's clothing, they occasionally showcased children's and infant's clothing, but interestingly, there were no men's outfits in these magazines. Girls' attire was typically shorter than that of adults and had a lower waistline. During the summer, ornate hats and parasols were considered essential accessories. These models were made from lighter summer materials such as linen, batiste, or silk, and they used ruffles, lace, ribbons generously on both the skirt and blouse sections. The skirts were cut from 7 to 9 pieces, ensuring that they relatively followed the body's contours at the hips but had considerable fullness at ankle height. It was allowed for the upper part of the dress to gently drape on the body, but a waist belt was mandatory, emphasizing the ladies' slender waists. (8)

During the lively atmosphere of Budapest, the affluent individuals would travel to the countryside in the summer, and some could afford to vacation by the seaside. The magazines of that era did not showcase attire in the modern sense for beach stands, but you could find so-called "seaside" clothing in these publications.

In addition to outerwear, the magazine also presented the current fashion of various undergarments and accessories, allowing elegant ladies to expand their wardrobes.

The „Magyar Bazár, mint a Nők Munkaköre" played a significant role in informing upper-class ladies between 1873 and 1904. This encompassed various aspects of social and literary life as well as fashion. Its appearance and graphics were of a high standard, similar to prominent foreign publications of the time. The magazine successfully achieved its goals of elevating the intellectual level in Hungary, refining the women's thinking, and being a friend to Hungarian aristocratic families.

3. image:Ice skating outfits



4. image and 5. image:Horse riding and "automobile" outfit

6. image: Fashionable underwear

7. image: Light spring clothing for young girls

Study of the application of artificial intelligence together with CAD programs for the development of collections of clothing models

Imiila Rysbaeva 1; Baktygul Turganbaeva 2; Gulida Kudakeeva 3
Kyrgyz State Technical University (KSTU), Kyrgyzstan Bishkek city

Annotation

Artificial intelligence empowers and optimizes the fashion industry: it recognizes clothes from photos, accesses virtual fitting sessions, and, without much effort, easily selects the perfect size. The program will automatically design the pattern and technically reproduce the patterns by size, height and fullness.

Introduction

Exploring the application of artificial intelligence together with computer-aided design and development systems in a computer-aided design (CAD) system to create collections of clothing patterns can yield many interesting results.

- First, AI can be used to analyze fashion trends and predict future trends. Machine learning algorithms can process vast amounts of fashion data, including information about past and current collections, designs, color schemes, and consumer preferences. AI can quickly analyze this data and predict future fashion trends, helping designers create more relevant and in-demand patterns.
- - Second, AI can be applied to optimize the design process of clothing models. By using machine learning algorithms, AI can analyze and process data on garment designs, sizes, materials and construction to optimize the design and production process.
- - The third possible application of AI is to create virtual models of products. Using computer vision and generative AI algorithms, virtual models can be created and simulated to be worn on different body types. This can help designers evaluate the visual effect and fit of garments on different body shapes and sizes, which can improve the fit and aesthetics of the models. Exploring and applying AI in collaboration with CAD to develop collections of clothing models can improve the efficiency and accuracy of the design and production process, and increase the relevance and demand for models. This can help fashion designers and clothing manufacturers meet the demands of today's market and increase the competitiveness of their products.

Methods and materials

In the research work we used Midjourney AI network to simplify the creation of new clothing designs. With its help, we created a series of Kyrgyz national costumes, the patterns of which were created in the graphic designer program Grafic 12. Subsequently, these models were refined to obtain an accurate cut in the Clo3D program.

The work was carried out in three stages:

1. Development of a new collection in the Midjourney network;
2. Design of cut details of the product on the program Grafis 12;
3. Virtual fitting of the product on the avatar in the CLO3D program.

Results and discussion

In the course of research work, sketches of Kyrgyz national dress as seen by artificial intelligence were obtained, **Figure 1**.

Figure 1. Product sketches

The design of models is developed in CAD Grafis 12 with the introduction of modeling features on them to accurately obtain the cut. The design base is worked out, where additions, widths, lengths and some features of the garment design are determined, **Figure 2.**

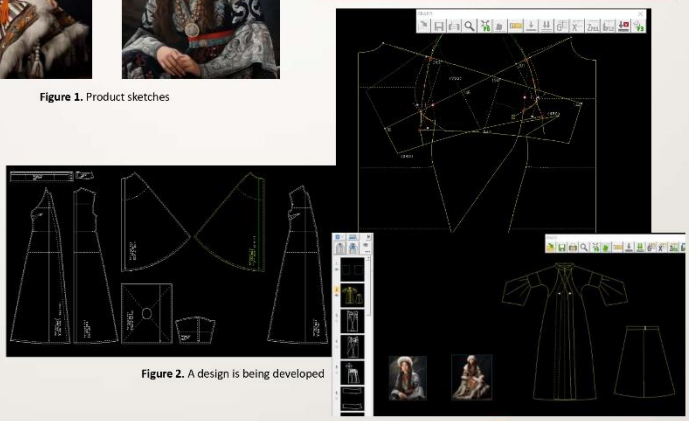


Figure 2. A design is being developed

Virtual fitting of the product in the Clo3D program is used to check the cut details. The patterns are loaded and the avatar is dressed on a pre-prepared avatar, **Figure 3.**

Figure 3. The process of working on the Clo3D program

Conclusion

The use of neural networks is a rapidly and successfully developing trend, which is already showing positive results, and possible shortcomings of the method in design can lead to the creation of models with "zest".

Not an unimportant character is that from an ecological point of view, the use of neural networks and graphical programs is very beneficial, as it eliminates the moment of experimental sewing of the product. And this in turn reduces the cost of fabric, accessories and time for its manufacture.

Bibliography

1.Internet sources: https://goo.su/icvBF
2.Internet sources: https://goo.su/REMGoo
3.Internet sources: https://goo.su/STJaZV
4.Internet sources: https://lifehacker.ru/kak-polzovatsya-midjourney/
5.Internet sources: https://goo.su/MvUWnN

CREATIVITY, PRODUCT DESIGN, ENGINEERING AND THE ART OF ORIGAMI

Dr. Gabriella OROSZLÁNY1, Dr. László KOLTAI 2
1ÓBuda University, Sándor Rejtő Faculty of Light Industry and Environmental Engineering, Institute of Product Design,
2ÓBudai University, Rejtő Sándor Faculty of Light Industry and Environmental Engineering, Institute of Media Technology and Light Industry

Abstract

Creativity is one of the most important faculties of human thinking, a fundamental skill that allows us to think outside the box and come up with innovative ideas that can change the world.
Creativity is particularly important in product design and engineering, and in all areas where new and unique solutions are constantly needed to solve different problems.
Creativity can be developed. One such development technique that has become increasingly popular in recent years is origami. Origami is the Japanese art of paper folding, which involves folding a single sheet of paper into different patterns and shapes. Origami is not only a fun and relaxing hobby, but also a method to develop creativity. Making origami is a manipulation of materials. This manipulation of materials can help research and development because it can be used to make models, prototypes, and designs. In many areas of industry, it can be an excellent source of inspiration and help to develop new ways of solving problems.
In this article, we show how these four areas - creativity, product design, engineering, and origami - are connected, intertwined, and intersect.

Keywords:
creativity, product design, engineering, origami.

INTRODUCTION

At first glance, these four concepts - creativity, product design, engineering, and paper folding - may seem unrelated. However, a closer look reveals that there are many parallels between creativity, engineering, product design, and paper folding.
Creativity is essential in both engineering and product design, both activities require creativity to solve problems and develop new and innovative solutions.
According to the Word Economic Forum, creativity as a skill will be high on the list of the top 10 skills for 2025. And in the years after 2025, creativity is likely to play an increasingly important role in the world of work. [1, 2, 3]

CREATIVITY

The word creativity is derived from the Latin word "creare", which originally meant "to beget, to give birth to, to create, to create" In Hungarian, the verb kreál probably first appeared, meaning "to create". The word "creativity" may have come from this.
The word creativity can be explained in many different ways, but the definitions all have in common that it means some kind of creative ability (e.g. scientific, artistic, musical... etc.), inventiveness, or ingenuity.
Some say that creativity is a special way of seeing and approaching challenges and tasks uniquely. Those with such a unique perspective or vision can adapt more easily to new challenges or unexpected situations. [1, 2, 3]
Some say that creativity is nothing more than a special creative energy. Creativity encourages you to try to solve the problem at hand not in the accepted, familiar way, but with curiosity and a unique vision. [2, 3]

Changes in creativity with age

In the 1960s, NASA approached Dr George Land - a researcher of creative output - and asked him to develop a creativity test to select innovative engineers and scientists. Dr. Land accepted the challenge and developed a creativity survey that worked very well. [4]
After the results, Dr Land wondered where creativity comes from. Her research tested the creativity of 1600 children aged between 3 and 5. He tested the same children again at age 10 and again at age 15. He then extended the study to 1 million adults. [4]
Dr Land looked at the ability of subjects to examine a problem and come up with new, different, and innovative ideas to solve it.

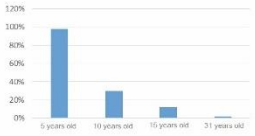


Figure 1:Changes in creativity over time (based on Dr Land's findings)

The results are staggering. We are at our most creative in childhood, and as we grow up we largely lose our creativity. So our creativity levels decline steadily and rapidly with age: what could be the reason? Dr. Land explained in his book "The Breaking Point and Beyond", "We have concluded that non-creative behavior can be learned." [4]
It follows that if non-creative behavior can be learned, then creativity can be developed. [4]

ORIGAMI IS THE ART OF PAPER FOLDING

Globally, the term "origami" refers to the folding of paper to form objects for fun. Origami is the art of folding paper. [5]
In the 1980s, many folders began to systematically study the mathematical properties of folded shapes, leading to a rapid increase in the complexity of origami models. [6]
Since the end of the 20th century, there has been a renewed interest, both artistic and scientific, in understanding the behavior of folded material.
The "new origami", which distinguishes it from the old craft practices, has developed rapidly thanks to the contribution of computational mathematics and the development of techniques such as box folding, tessellation and wet folding. Artists such as Robert J. Lang, Erik Demaine, Sipho Mabona, Giang Dinh, Paul Jackson and others are often cited for promoting new applications of the art. The computer aspect and the exchange through social networks, where new techniques and designs are presented, have raised the profile of origami in the 21st century. [7, 8]

Figure 2: Works by origami artists.) Tomoko Fuse (Japan) origami artist - regarded as one of the world's most outstanding modular origami artists b.) David Huffman (USA) - electrical engineer and origami artist, specializing in the development of abstract and geometric structures based on curvilinear folds c.) Eric Gjerde (Norwegian-American) - origami artist, specialising in the development of tessellations

HOW ORIGAMI HELPS TO DEVELOP CREATIVITY

Origami is an excellent way to develop creativity using traditional paper folding techniques. It allows you to learn new skills and express your creativity through practice.
1. Problem-solving: origami requires following a series of instructions, and folding and manipulating paper to create a specific pattern. This activity requires the individual to critically
think and find solutions to achieve the desired result. Encourages problem-solving skills, as you need to figure out the correct sequence of folds to create the desired shape.
2. Spatial awareness: origami involves understanding and manipulating spatial relationships. Practitioners need to visualize how a flat piece of paper can be transformed into a three-dimensional object. This process helps to develop spatial thinking skills, which are essential in various creative fields such as architecture, design, and sculpture.
3. Fine motor skills: the delicate and precise nature of origami folding improves fine motor skills. Folding operations require careful eye-hand coordination, dexterity and control. This improved motor control can also benefit other creative endeavors such as drawing, painting, or playing an instrument.
4. Concentration and patience: origami requires concentration and patience. It teaches the individual to focus attention on the task at hand, to understand complex instructions and to follow them step by step. This practice of persistent attention and patience is valuable in any creative activity, as it allows individuals to fully engage in the creative process and overcome challenges.
5. Exploration and experimentation: although origami involves following instructions, there is also room for personal exploration and experimentation. Once individuals have become familiar with basic folding techniques, they can start exploring different variations, creating their designs, or combining origami with other art forms. The freedom to experiment fosters creativity and encourages individuals to think outside the box.
6. Therapeutic benefits: origami can have a calming and therapeutic effect on individuals. The repetitive actions of folding can reduce stress, promote relaxation and increase awareness. When the mind is relaxed, it becomes more open to creative ideas and inspiration.
7. A source of joy: origami is a fun and relaxing activity that promotes self-expression and creativity.
In summary, origami helps to develop creativity by stimulating problem-solving skills, improving spatial perception, developing fine motor skills, promoting concentration and patience, encouraging exploration and experimentation, and providing therapeutic benefits.
Today, engineers, designers and origami artists are working together in several disciplines. Origami is used in many fields, even to solve difficult technological problems. For example, origami helped to develop the folding of a small airbag - a folding process that allowed the airbag to be deployed in a fraction of a second - and the folding technology for solar panels used in space exploration.

CREATIVITY OBJECT - DESIGN CONSIDERATIONS

We aim to provide techniques and opportunities that open the doors of imagination and creativity and help students to dream and realize big ideas.
Skills and competencies that can be developed through the planned course:
- developing creativity,
- developing spatial vision,
- developing the ability to associate,
- can help develop geometric thinking,
- can help simplify and transform complex forms, o e.g.: simplifying shapes using geometric shapes, o e.g.: minimizing details, o e.g.: optimizing the contrast effect,
- using the techniques learned, it is possible to create prototypes,
- can help you test new ideas,
- develops the ability to generate ideas,
- helps in model experiments.

OUR EXPERIENCE SO FAR IN INTEGRATING ORIGAMI INTO EDUCATION

On an experimental basis, we used origami in a workshop at the Budapest and the Odorheiu Secuiesc outsourced engineering training. Our experience showed that the students enjoyed and valued the work.
During the training in Odorheiu Secuiesc, students were given individual and group tasks. The individual tasks helped them to learn the basics of folding and encouraged them to complete further tasks. In groups of two, they practiced joint problem-solving, cooperation and division of labor. Groups of two had to build a paper tower from different types of paper in each team, following set rules. The purpose of using different types of paper was to familiarise the students with the different materials and to give them a basic knowledge of materials. The completed towers were compared and ranked according to their height, stability, load-bearing capacity, and aesthetic characteristics.
In Figure 4 you can see the focus, the joint work, and the division of labor and in Figure 5 you can see some of the completed towers.

Figure 3: Origami project at the outsourced training in Odorheiu Secuiesc

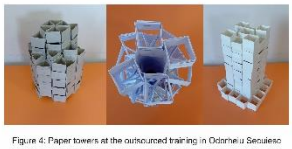


Figure 4: Paper towers at the outsourced training in Odorheiu Secuiesc

In the Budapest training, students were also given individual tasks The aim of the individual tasks was to learn the basics of folding and to encourage them to complete further tasks. In the second part of the work, the students used pre-designed pattern bases. Using the pattern bases to create simple folds, we created simple basic shapes that are inspiring and versatile. We studied the created geometric shapes, contrast effects, and movement possibilities (e.g. stretching, compression, twisting, bending and combinations of those) on the pieces we created.
The resulting shapes were transformed into new shapes by moving them around and studying the results again. The individually made basic elements were joined by gluing, creating a modular structure of several identical basic units, which was studied again.
Here too, the students' work was characterized by focus, concentration, accuracy, sequencing of operations, discipline and a willingness to experiment.

Figure 5: Origami project at the Budapest training

SUMMARY

Origami allows children and adults to express their creativity. By creating origami models, children and adults are free to experiment with different folding techniques and shapes.
As a result of our research, and from our practical sessions so far, we have found that origami can have several benefits for developing creativity.
Throughout the projects, we found that origami can help develop spatial thinking. In creating origami models, students had to understand spatial relationships to fold the paper in the right way. This skill can be useful in many areas of mathematics, engineering and art.
Feedback suggests that folding exercises develop problem-solving skills. Origami models are often challenging and require creative thinking to complete successfully.
In addition, it was found that origami-based exercises develop manual dexterity and fine motor skills. When creating origami models, students need fine motor skills to fold the paper accurately.
Origami is a fun and creative activity that can bring many benefits to the education of engineering students.

REFERENCES

[1] SZLAFKAI, É.: ÉLJ KREATÍVAN!, HVG KIADÓ, ISBN 9789633048610, BUDAPEST, (2020)

[2] LAND G., JARMAN B.: BREAKPOINT AND BEYOND: MASTERING THE FUTURE TODAY PAPERBACK, LEADERSHIP 2000 INC, ISBN-10 0962660523, ISBN-13 978-0962660528, (1998)

[3] https://www.forbes.com/sites/tonygambill/2021/10/04/how-the-best-problem-solvers-overcome-perception-bias/

[4] WARDLE D.: CREATIVITY - CAN ANYONELEARNT O BE CREATIVE? https://www.linkedin.com/pulse/creativity-can-anyone-learn-creative-brandminds/

[5] KOSHIRO, H, HISTORY OF ORIGAMI IN THE EAST AND THE WEST BEFORE INTERFUSION, BY TAYLOR AND FRANCIS GROUP, LLC (2011)

[6] LANG, R.: ORIGAMI DESIGN SECRETS, DOVER PUBLICATIONS, (2003)

[7] MCARTHUR, M.: FOLDING PAPER: THE INFINITE POSSIBILITIES OF ORIGAMI, ISBN 978- 0804843386, TUTTLE PUBLISHING (2012)

[8] MCARTHUR, M.: NEW EXPRESSIONS IN ORIGAMI ART, ISBN 978-0804853453, TUTTLE PUBLISHING (2020)

CORRESPONDING AUTHOR

Dr László KOLTAI
Faculty of Light Industry and Environmental Engineering / Óbuda University
H-1034 Budapest, Doberdó str. 6
1034, Budapest, Hungary
E-mail: koltai.laszlo@uni-obuda.hu

Dr Gabriella OROSZLÁNY
Faculty of Light Industry and Environmental Engineering / Óbuda University
H-1034 Budapest, Doberdó str. 6
1034, Budapest, Hungary
E-mail: oroszlany.gabriella@uni-obuda.hu

INNOVATION IN SKYDIVING CLOTHING

Orsoly Nagyné Dr. Sabó[1], András Koleszár[2] Zoltán Dolhai[3]

[1-2] Institute for Industrial Product Design, Sándor Rejtő Faculty of Light Industry and Environmental Protection Engineering, Óbuda University, Doberdó u. 6, H-1034 Budapest, Hungary

[3] Intrudair Kft, Simai út 9., H-4400 Nyiregyháza, Hungary

9th International Joint Conference on Environmental and Light Industry Technologies 10 November 2023, Budapest, Hungary Óbuda University

Abstract:

In this article, we present the development of sportswear for the ever-growing extreme BASE jumping and skydiving sports, from the clothing needs of beginners to professional competitors. Zoltán Dolhai, owner and managing director of Intrudair Ltd. manages a unique business in Hungary, manufacturing custom-made parachute and wingsuits for 25 years for skydivers all over the world. The research work was supported by the GINOP-2.1.2-8-1-1-4-16-2019-00901 grant, with the participation of colleagues from the Institute of Product Design of Obuda University.

In this article, we describe the difficulties of custom manufacturing and the digital options that have been developed to solve the problems that arise. The range of sportswear produced by the company is very wide, from parachute sports to wingsuits and their accessories, everything is made to measure. The experience of freefalling and flying is not only possible by jumping out of a plane, there is also the possibility to practice jumping in a wind tunnel. Every circumstance requires a different type of clothing. The athlete needs to feel the flow of air over his body, whatever way he flies, as it helps him to feel how much force he needs to move his body parts, where he needs to put force by tensing his muscles to keep his balance. The choice of materials used to make the garments is very important, as they need to be made from fabrics with good strength properties as well as those with high elasticity.

Keywords: *Skydiving sportwear, Formfitting clothes, Custom made wind tunnel suits, Custom made wing suits, dynamic movement,*

INTRODUCTION

Parachuting is an extremely dynamic sport, which has led to the development of extreme sports, the development of which is a constant challenge for textile manufacturing and clothing companies. . Athlets also jump from a plane in a winged suit, but jumping off a high cliff is common. Base jumping is a jump from a relatively low height (compared to the minimum height of 800 meters for skydiving) and from fixed objects or natural formations, during which the jumpers use special parachutes, but different in terms of their opening and folding properties. For practicing jumping, the wind tunnel offers sports and entertainment opportunities. In this structure, everyone can try the experience of free fall with the lifelike feeling of a real fall. For practicing jumping, the wind tunnel provides sport and entertainment. In this structure, everyone can try the experience of free-falling with the realistic sensation of falling. In the wind tunnel, the wind force is adjustable, so people of different weights and with different flying skills can try freefalling in various positions. For practicing in the wind tunnel, we will show the technological development of the suits recommended for beginner flying, where an instructor will hold the student in the wind tunnel.

1. DEVELOP WIND TUNNEL SUITS

The expansion of the wind tunnel market has increased the need to develop specialized competition clothing for extreme skydiving. The professional experience of the management and staff of Intrudair Ltd. and the market position of the Company enable it to be at the forefront of the world market for this type of product in the professional tunnel clothing segment. This product will be a more comfortable garment than ever before, even more conducive to high-speed wind tunnel flying, and will meet the increased high demands of this sport.

With the development of technical garments, curved cut lines following the contours of the body are becoming increasingly important, making the garment more attractive to athletes from a design and ergonomic point of view.

In the wind tunnel sport, we keep several flight styles: Head up, Head down, Freestyle, Dynamic 2 way, Dynamic 4 way, FS 4 (formation skydiving) FS 8. Learner level or visitor flight. Different construction of clothes are used for each style, and the material composition of the clothes is also different. We develop prototypes for freestyle, dynamic fly, FS4, learner and tunnel passenger styles.

The construction of the clothing should basically fit the body, be comfortable and ensure the free flow of air around the athlete's body. This requires materials with suitable properties. The athlete must feel the flow of air over his entire body, abdomen, back and limbs, with the help of which he can feel the force with which he must move his body parts, his balance, and where he must apply force by tensing his muscles.

1.1 Wind tunnel suits for first fighter

Beginner students and visitors start to practice in "first-flyer" passenger clothes with professional trainers in the wind tunnel. These suits contain grips.

Grips must be attached to these clothes so that the trainer can hold the student anywhere and anyway during the training. An important point is that the placement of the „grips" on the garment is adapted to the wearer's level of knowledge.

1.2 Requirements of first flyer passanger cloths

Ergonomic and physiological aspects:

The inflow of air is diverted around the body, preventing the suit from inflating and fluttering, making the user's flight unstable due to the altered undulating surfaces. The undulation of the fabric can affect the wearer's flight dynamics and posture, which in competitive sports is observed and assessed by scoring judges. In addition, its breathability allows sweat to escape to the outer surface of the garment, where it quickly evaporates in the flow.

Functional aspects:

- Comfortable, practical, can be worn even after several hours of active movement,
- Internal processing does not cause irritation and provides a second skin feeling.

Strength aspects:

The tensile strength of the materials must be adequate. When selecting seam types, we use those that have high tensile strength in the case of loading perpendicular to the seam, or with high elongation in the direction of the seam. (Figure 1,2)

Figure 1: Front *Figure 2: Back*

2. TUNNEL SUIT CONSTRUCTION

The production preparation staff of Intrudair Kft. switched from manual editing to the use of a digital vector graphics program more than 5 years ago. This allows you to use the laser cutter. Tailoring samples for individual sizes are currently made with a general vector graphic program, so the tailoring is accurate and precise. (Figure 3)

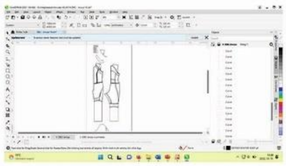


Figure 3: Pattern design with CorelDraw vector graphical system

Within the framework of the tender, a special Morgan CAD clothing industry production preparation program was purchased, so in addition to the unique, dimensional editing, the ready-to-wear production process is also easier and more efficient, which can be used for tunnel clothes in the case of orders from sports associations. Taking into account the geographical location of the customer and the average size type of the tourists who visit there in the largest number (EUR, Asia, USA), the design of the size chart is also a pivotal point in the case of clothes designed for ready-to-wear production. (Figure 4)

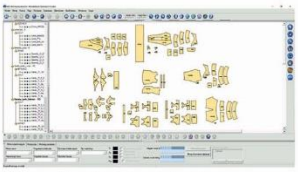


Figure 4: Pattern design with Morgan CAD system

Patterns and the accuracy of the cut have a major influence on the size of a tailor-made garment. As clothes are typically tailored individually for each customer, the use of a laser cutter is useful and justified. (Figure 5)

Figure 5: Laser Cutting System

3. ASPECT OF TEXTILE SELECTION

We used 3 types of raw materials to develop the dress: A material called Brunico, the characteristic of which is that it is a soft, highly elastic material, in the neck area, wrists and places in contact with the skin. Teslan: lightweight material with high strength properties and low elasticity, Cordura: non-elastic material with high abrasion resistance and high tensile strength The development of the garment takes into account aesthetic and comfort aspects, with testing in a wind tunnel. During the development process, several products are made, the subjective evaluation of the test person is also taken into account for their further development. The final prototype is evaluated in detail in the documentation. (Figure 6)

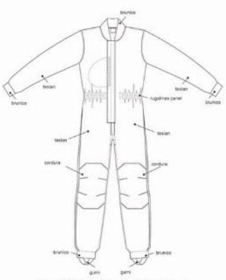


Figure 6: Technical drawing of first flyer suit

4. PLACEMENT AND DESING OF GRIBS

The way of fitting the grips is a key point for this type of garment, our aim is to create a "first flyer" garment for versatile and comfortable use in wind tunnels, with an optional grip design where the customer chooses the garment collection best suited to his/her educational theme, which is tailored to the wind speed and energy requirements and performance of the channel, both in terms of size range and the related generosity and thickness of the material.

The grips should be easy to grip with strong anchor points, the centre of the sew-on is aligned with the position of the grip, this determines the direction from which the instructor grips the student to hold him, how deeply the fingers of the holding hand can grip the cylindrical or square shaped filler of the grip.

The size and density of the padding is also a critical point, cylindrical or square if required, too large handholds can flap in the wind, hurting the student's back and sides, interfering with flight, very fluttery parts wear out more quickly. Soft stuffing wears out even more over time, making it impossible to hold on firmly at critical moments, and too hard can cause injuries when flapping. Undersized grips or grips with inadequate centre grips can slip out of the instructor's hands and in an unfortunate case cause a serious accident. Collision with the glass of the channel or uncontrolled impact on the grating in an unfortunate position can result in serious limb or spinal injuries. (Figure 7-8.)

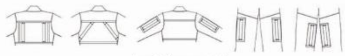


Figure 7: Placement of gribs

Figure 8: Design of gribs

5. STRENGTH TESTING OF GRIPS

The Gribs are made of Cordura material and are fixed in place through several layers of material where there is also Cordura material for adequate tensile strength. Wherever possible, one edge of the grib rail is sewn into a seam line, e.g. around the armholes, neck seams, double stitched to the base material, using a reinforcing ribbon which also serves as a decoration.

The tensile test was carried out at the Textile Laboratory of Óbuda University on the ZWICK Textenser. For the test, test strips of the appropriate material were cut out and the tensile strength of the raw materials was determined. For each type of fabric, 5 samples were torn in warp direction, as this is the guideline for tailoring the garment. The seam tensile strength was then tested in the direction perpendicular to the seam, since this is the direction of greatest stress. For the seam breaking force test, all the test strips were performed on the same sewing machine with the same stitch density setting. The test bars were cut with hand scissors, taking into account the direction of the thread as worn.

The sewing circumstances are important to have an appropriate product. We use Groz-Beckert GEBEDUR® needles are coated with titanium nitride, making them better harder than standard needles. Especially in the point and eye area, they offer better protection against abrasion and damage, resulting in consistently good stitch quality and longer needle life. The stitch density: 30 stitch/ 10 cm, and we use Coats gral Tex 060 thread.

5.1 Tensile strenght of sewing tipes

To test the tensile strength of the grips, test samples were made using 3 different sewing techniques. (Figure 11)

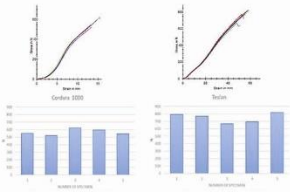


Figure 9: Tensile test of Cordura *Figure 10: Tensile test of Teslan*

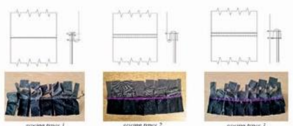


Figure 11: Tensile strenght of sewing types

Groz-Beckert GEBEDUR® needles are coated with titanium nitride, making them better harder than standard needles. Especially in the point and eye area, they offer better protection against abrasion and damage, resulting in consistently good stitch quality and longer needle life.

Figure 12: Means

6. EVALUATION

The test bars were torn at the Teslan material during tensile testing of seam tensile strength test specimens 1 and 3, which suggests that the seam does not reduce the tensile strength of the welded materials. Specimen 2 ruptured at the seam, and this seam type should therefore be excluded from the design technology of the grips. The study found that the tensile strength of seam type 3 exceeded the individual tensile strength of the materials, so design technology 3 is used. (Figure 12.)

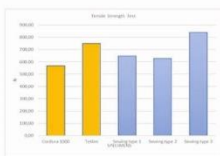


Figure 12: Tensile strenght of base materials and the 3 sewing tipes

REFERENCES

[1] Intrudair Gyártó, Kereskedelmi és Szolgáltató Kft. GINOP-2.1.2-8-1-4-16-2019-00901 Új generációs szárnyas, - illetve tunnelruhák kifejlesztése az Intrudair Kft - nél

[2] https://www.nah.gov.hu/hu/szervezet/innovatext-textilipari-muszaki-fejleszto-es-vizsgalo-intezet-zrt-dde5e332-4380-4ec0-86af-eb1154a0d735/

[3] https://intrudair.com/product-selector.php

Corresponding author:
Orsolya NAGYNÉ Dr. SZABÓ
Institute for Industrial Product Design, Sándor Rejtő Faculty of Light Industry and Environmental Protection Engineering
Doberdó u. 6, Óbuda University
H-1034 , Budapest, Hungary
Phone: +36 1 666 5935
E-mail: szabo.orsolya@uni-obuda.hu

TEXTURES AND TEXTS

BY EDIT CSANÁK

MATERIAL IMPRINTS OF HUMAN EXISTENCE IN LITERATURE

INTRODUCTION

Traditionally, both clothing and architecture serve the human way of life. Textiles and architecture are connected straightforwardly and fundamentally. According to Plato, the Greek philosopher, *"Our first and greatest need to live at all, to exist, is to get food. (...) Our second need is housing; the third is clothing, and so on." (Platón, 1988.) Textiles and fashion provide people with wearable clothes. Architecture provides a home for people to live in. Plato called weaving itself a "royal process,"* emphasising the importance of constructing clothing with balanced concern; the construction of clothing should be done with the same rigour and precision as the design of a building. The article does not focus on examining them and limiting itself to the discourse of textiles, highlighting that some exciting contemporary research has shed light on the presence of textiles in written sources and the diversity of descriptions related to textile making and dressing in literature. This study is in the early stages of research, and the investigation is not comprehensive; it is more like a teaser.

Penelope, the mythical weaver in a painting by John William Waterhouse (1912)

MYTHS AND EPICS

Textiles have long been used by texts as a medium for metaphorical thinking. Myths from many different cultures create connections and archetypes between weaving and female deities. In this regard, we owe a lot to, for example, Greek mythology. Some of these myths reveal dangerous concepts and suggest subversive ideas. In the Odyssey, Penelope is the embodiment of female loyalty, who waited for her husband, Odysseus, for twenty years until he could finally return home. For three years, she wove the death shroud for her father-in-law, Laertes, thus devoting herself to answering the suitors who harassed her in Odysseus's absence. What he weaved during the day, he broke down at night. This is what the saying refers to: *"It is made like Penelope's*

Clotho, Lachesis and Atropos, the three messengers of Fate - Flemish tapestry (Brussels, c. 1510-1520), Victoria and Albert Museum, London

Other mythical figures are also strongly associated with textiles. The three monstrous Moria - Clotho, Lachesis and Atropos - called the goddesses of fate in Greek mythology, spin, coil and cut the thread of life.

THE MAGIC OF WEAVING, SEWIN AND THE CLOTHES IN FAIRY TALES

There are many examples in the literature of spells produced by handwork, as well as the realization of spells in the form of protective talismans, amulets and clothes. Folktales talk more about clothes and clothing than we might think at first. Clothing typical of a fairy tale hero or character carries many different meanings. The reason for this is rooted in the unified worldview according to which clothing reflects who the wearer really is. Further paradoxes of the interpretation of textiles can be found in the characteristics of the wearing of the fabric and the description of the clothes; the textile as a material that wraps the body and represents the character.

FEMALE AND TEXTILES IN LITERATURE

The relationship between the women involved in the process of textile production has been one of the cornerstones of social norms for centuries. The value of women's needlework as a way of self-expression is reinforced by the number of recurring literary motifs, which descriptively demonstrate the ability of textile production to absorb the spirit of its maker and to contain the secrets of women. As a result, literature from different cultures and eras abounds with descriptive depictions of women engaged in textile production.

Joshua Reynolds: Portrait of the Waldegrave Ladies, 1780

(left) Jean Etienne Liotard: Portrait of a Young Girl Embroidering, 18th century; (right) Portrait of Catherine Brass Yates by Gilbert Stuart, 1793.

Yarn woven into fabric, handwork created, and fabric taking shape in the form of clothes are the "living" properties of textiles that can express the spirit of their creator or wearer in material. The metaphors present the maker by conveying material fragility, through the textile's ability to take over the creator's energy and spirit; the quality of how it can

SUMMARY

As a result of the research, we were able to gain more knowledge about how references to textiles and clothes influenced cultural discourse over the centuries, emphasizing the importance of universal literature, myths, tales and novels in the broad explanation and celebration of textile culture. The research tried to shed light on the frequency of use of textiles, word images formed in connection with textiles, textile products and clothing production in literature and culture. The research article published as a result of the project tried to shed light on a wide range of topics related to fabric, with which this topic weaves the rich tapestry of

The Lady with the Camellia - poster by Alphonse Mucha for the theatrical version with Sarah Bernhardt (1896)

REFERENCES

Andersen, Hans Christian. 1890. Andersen meséi. Budapest, Lauffer, 1890.
AURELIUS, MARCUS. 1908. ELMÉLKEDÉSEK. Oxonii, 1908. MEK00606. A fordítás alapjául szolgáló kiadás: I. H. Leopold: M. Antoninus imperator ad se ipsum. Oxonii, 1908.
Brontë, Charlotte. 1991. Jane Eyre. Budapest, Európa, 1991.
Catullus, Caius Valerius. 2009. Péleus lakodalma. Budapest, Margó Kiadó, 2009.
cordis.europa.eu. 2013. The importance of textile in art and architecture. University of Zurich. 2013.
Dumas, Alexandre. 1968. A kaméliás hölgy. Budapest : Európa, 1968.
Flaubert, Gustave. 1904.. Bovaryné. Budapest, Révai, 1904.
Gilgames. 2004. Budapest, Terra, 2004.
Platón. 1988. Az állam. Budapest, Gondolat, 1988.
Poplett, Patricia M. 2015. Textiles in Texts: Literary Representations of Women's Textile Crafts. Kent, kent.ac.uk, 2015.
Postrel, Virginia. 2020. The Fabric of Civilization: How Textiles Made the World. New York, Basic Books, 2020.
Shakespeare, William. 1886-1891. MACBETH. Budapest, Ráth Mór, 1886-1891.
Zigány, Árpád. 2023. GRIMM Legszebb Tündérmeséi . Budapest, Magyar Elektronikus Könyvtárért Egyesület,