Centre for Research & Innovation in Science, Arts & Technology

presents

5th Textile Research Conference

Textile Research Conference

TRC 2024

Dhaka, Bangladesh

in collaboration with

SOUTHEAST UNIVERSITY

Meeting the Challenges of Time

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Call for Papers for the 6th Textile Research Conference (TRC) is now open! For details, scan the QR Code.

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TRC 2024 - Programme

	26 October 2024 | Multipurpose Hall (9th Floor), Southeast University, 252,Tejgaon I/A, Dhaka
09:00	Registration
10:00	**Plenary Session** **Welcome –** *by Professor Engr. Mashud Ahmed, Dean (Acting) SSE, Chairman Dept. of Textile Engineering, Southeast University & Ex VC BUTEX*
10:10	**Short Keynote – Bangladesh 2.0: Textile Innovator or Follower?** *Dr. Sadat Sayem, Manchester Metropolitan University*
10:20	*Special Guest - Mr. Abdus Sobhan, CIP & Managing Director, Auke-Tex Group*
10:30	*Special Guest - Professor Ayub Nabi Khan, PhD, Pro-VC, BGMEA University of Fashion & Technology*
10:40	*Chief Guest*
10:50	*Co-Chair –Professor M. Mofazzal Hossain, PhD, Pro-VC, Southeast University*
11:00	*Chair - Professor Yusuf Mahbubul Islam, PhD, Vice Chancellor, Southeast University*
11:10	**Refreshment**
	Technical Session 1
11:20	**(Keynote) Compliance in the Global Textile Supply Chain** *Dr. Michael Klode, Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH*
11:40	**(Keynote) Study on Noise Pollution Created by Machinery in Wet Processing Industry** *Professor Arun Kanti Guha, Southeast university*
12:00	**Rapid Synthesis and Characterization of Cellulose Acetate from Textile wastes for Bio-composite Film Applications,** *Md. Abu Saeed, BGMEA University of Fashion and Technology (BUFT)*
12:20	**Environmental Sustainability in Fashion Supply Chain: Insights from a Developing Country** *Md. Shamsuzzaman, World University of Bangladesh*
12:40	*Discussant – Dr. Engr. Md. Fazley Elahi, Head of Research & Development, DBL Group*
12:50	*Discussant -- Mr. ASM Hafizur Rahman Nixon, Executive Director, RH Corporation*
13:00	*Chair - Professor ANM Ahmed Ullah, PhD, Southeast University*
13:10	**Break - Prayer and Lunch**
	Technical Session 2
14:30	**Impact of AI in Fashion Industry** *Md. Mazharul Islam, Northern University Bangladesh*
15:00	**3D Design Technology, Sustainability and Growth of the RMG Industry in Bangladesh** *Urmila Mukhtar Jeny, BGMEA University of Fashion & Technology*
15:30	**(Virtual Keynote) Stab resistance and thermo-physiological comfort properties of boron carbide coated aramid and ballistic nylon fabrics,** *Professor Rajkishore Nayak, RMIT University - Vietnam*
16:00	**(Virtual Talk) Climate Change and Apparel Industry – Sri Lankan Perspective** *Devathanthrige Janaka Chamara Harshana Senadeera, Manchester Metropolitan University*
16:30	*Chair – Dr. Sadat Sayem, Manchester Metropolitan University*
16:40	**Tea/Coffee and Networking**

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Abstracts

(Keynote)

Compliance in the Global Textile Supply Chain

Michael Klode
Programme for Sustainability in the Textile and Leather Sector (STILE),
Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH

The talk will address the technical elements of the compliance aspect, which is growing in relevance for the competitiveness in many markets. Energy, decarbonization, water, worker rights, social protection or recycling are different categories for ESG data or certifications. These elements are becoming almost as relevant as technical set up of a production process. Embracing them will definitely raise the competitiveness of the RMG industry in Bangladesh.

(Keynote)

Study on Noise Pollution Created by Machinery in Wet Processing Industry

Arun Kanti Guha*, Md. Arafat Mahi and Md. Abir Rahman
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Noise pollution is a serious problem in textile industry. As per literature survey, we found that noise pollution created by machinery in spinning mills was studied in Bangladesh. But noise pollution created by machinery in wet processing industry was not studied. No report was found in the literature. To this scientific view point, authors studied noise pollution created by machinery in wet processing unit in a dyeing industry of Bangladesh. Authors measured noise level by using portable sound level meter and recorded properly. Noise created by dyeing, stenter, slitting and dissolver machinery was measured. An average of seven days measurement of noise level was recorded. Noise level of each machine was measured five times a day and seven days a week. As a result, precise and accurate data were obtained. A range of 80-101dB noise was recorded which was detrimental to concerned workers and engineers who were present in the dyeing and finishing floors. The standard noise levels in industrial area of Bangladesh are 75dB (day) and 70dB (night).

Rapid Synthesis and Characterization of Cellulose Acetate from Textile wastes for Bio-composite Film Applications

Md. Abu Saeed*[1], Shahidul Islam[2], Md. Abdul Jalil[3], Shahin Hossain[4], Abdur Rahim Miah[5]
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This work focuses on investigating a potentially valuable resource for cellulose isolation from textile wastes, modification to cellulose acetate, and subsequent fabrication of bio-composite films reinforced with polyvinyl alcohol through the solution casting method. The process involves a stepwise alkaline kraft pulping method to extract cellulose from textile wastes using a well-established cellulose isolation technique, succeeded by rapid transesterification for acetylation into cellulose acetate. The isolated α-cellulose was esterified within 5 minutes using vinyl acetate monomer in a DMSO solvent system in the presence of sodium hydroxide as a catalyst. The synthesized cellulose acetates were characterized by FTIR,

1H-NMR, TGA, and chemical saponification techniques to evaluate morphological features, functional groups, and degree of substitution. FT-IR spectra show the distinctive peaks that demonstrate to prove the replacement of free OH groups by acetyl groups. 1H-NMR analysis shows the value of good degree of substitution. The curves from TGA analyses indicate that acetylation reduces the thermal stability of extracted cellulose. The traditional titrimetric method clearly reveals the degree of substitution. The cellulose acetate produced presented an average DS of 2.87. Finally, composite films were prepared by solution-mixing and casting with different contents of synthesized cellulose acetate (2; 4; 6; 8 and 10wt%) reinforced with polyvinyl alcohol (PVOH). Mechanical properties were investigated to assess the effect of cellulose acetate with polyvinyl alcohol. Result showed that the tensile strength values of the prepared films were 26.31-42.73 MPa. The range of Young's modulus was 1449.43 to 2117.65 MPa.

Environmental Sustainability in Fashion Supply Chain: Insights from a Developing Country

Md. Shamsuzzaman

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This study compares the environmental sustainability among Platinum LEED certified (Factory A), Gold LEED certified (Factory B) and Non-LEED certified (factory C) in Bangladesh. According to the LEED parameters water uses and pollution, both untreated and treated effluents were collected from case factories and conduct chemical testing. The results were compared against the acceptable limits of parameters- chemical oxygen demand (COD), dissolved oxygen (DO), biochemical oxygen demand (BOD), total dissolved solids (TDS), total suspended solids (TSS), the potential of hydrogen (pH) and color. The effluents were collected thrice in a month and considered average value for discussion. Findings showed that the LEED certified factories have shown greater potential in designing their plant for water uses and treatment than non-LEED certified factories. Although the initial (untreated effluent) parameters were out of standard by miles, Factory A and B achieve standard parameters after subsequence treatment whereas factory C would require a holistic approach to meet environmental sustainability. The study reveals that the LEED certification components and categorize influence the factory practitioners to oblige and implement sustainability practices in manufacturing, water consumption and treatment. It further identifies the technical limitations of non-LEED certified facilities in Bangladesh. The findings will motivate all stakeholders, including academics and researchers, to priorities reducing the environmental impact of knit textile manufacturing facilities. They will give more detailed information to industry practitioners, allowing them to make strategic decisions to make Bangladesh's knitted factories more environmentally sustainable.

Impact of AI in Fashion Industry

Md. Mazharul Islam

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Fashion design has really moved a long way from traditional approaches of drawing and designing by hand. Nowadays, most manufacturers use 2D software tools like Photoshop, Illustrator, and CorelDRAW for digital design processes. From the pandemic period onward, product development increasingly uses 3D design software such as CLO 3D, Style 3D, and Browzwear V-stitcher to minimize the number of physical samples required and cut down lead times. The integration of AI within the fashion industry has moreover changed design processes, reshaping how designers contextualize, create, and market their collections. However, the full power of AI remains a mystery to most professionals within the apparel business. Garment design using software such as Photoshop and Illustrator can be quite time-consuming, and 3D prototyping applications often require special training and high-performance computers. Where challenges do arise, AI presents a solution by not only improving creativity but also by quickening the design process when

compared to traditional graphic design software. It is clear that AI is beginning to make waves in fashion design through increased efficiency, the ability to custom-create pieces, and more innovative creations. The present paper discusses various ways AI impacts the fashion business in conceptualization and creation of designs, material development, analysis of trends, and interaction with consumers. In the end, AI is going to revolutionize the face of fashion design through enhanced creativity, personalized designs, sustainable development, and trend prediction. It is true that with advantages come challenges, such as the need to keep human artistic input intact and ensure safety in data management on consumers ethically. The fashion industry is constantly evolving, and with it, the interaction of AI in fashion design will continue to deepen, providing new possibilities that call for reflective approaches in the balance between technology and creativity.

3D Design Technology, Sustainability and Growth of the RMG Industry in Bangladesh

Urmila Mukhtar Jeny[1], Ghada Soliman[2] and Abu Sadat Muhammad Sayem[3]

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This research investigates the use of virtual design tools, particularly CLO 3D software, in Bangladesh's Ready-Made-Garments (RMG) sector, with a particular emphasis on 3D Designing and prototyping and its consequences for digital fashion design. This study analyses the user acceptance of 3D styling techniques, especially in design, which became more popular in 2016 and 2017. As a result of the Covid 19 pandemic, designers have begun to use 3D prototypes using Blender, After Effects, and CLO 3D to create virtual fashion with motion graphics. The study highlights user acceptance and the value of 3D styling and prototyping by analysing data collected from 300 professionals in the RMG sector to find areas where the industry can grow sustainably. As Bangladesh's contribution to global garment trade increases, the research seeks to outline pathways for the sector's sustainable development. Ultimately, the paper envisions the future prospects of 3D Designing Technology and the scope of prototyping in the field of Fashion Designing, aligning with the industry's trajectory towards digital transformation and innovation. The study tested and validated a preliminary model regarding the effect of digital transformation acceptance on sustainability growth.

(Keynote)

Stab Resistance and Thermo-Physiological Comfort Properties of Boron Carbide Coated Aramid And Ballistic Nylon Fabrics

Rajkishore Nayak

School of Communication & Design (SCD)

RMIT University – Vietnam

This research presents the stab resistance and thermo-physiological comfort properties of the fabrics prepared from high-performance fibres of aramid (i.e. Kevlar) and ballistic nylon. The fabric samples were coated with boron carbide to improve the stab resistance properties. The quasistatic stab tests were performed using NIJ 0115.00 standard knife (P1) on the Instron tensile testing machine and the dynamic stab test was performed as per the NIJ standard. The thermo-physiological comfort properties of the fabric samples were evaluated by measuring the air permeability, water-vapor resistance and thermal resistance. It was observed that the application of the coating significantly increased the stab resistance properties of the fabrics, which met the desired results in the dynamic stab test. Furthermore, the air permeability was significantly reduced, whereas the water-vapor resistance and thermal resistance were significantly increased with the application of coating. Hence, the coated fabrics will have to compromise the comfort aspects to achieve the desired protection level, which is the prime requirement for the stab resistant textile materials.

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