TERS 2024
Textile Engineering Research Symposium

Textile Engineering Research Symposium

Proceedings

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Department of Textile and Apparel Engineering
University of Moratuwa

TERS2024

TEXTILE ENGINEERING RESEARCH

SYMPOSIUM 2024

24st October 2024, University of Moratuwa.

Organized by

Department of Textile and Apparel Engineering

Faculty of Engineering

University of Moratuwa

Sri Lanka

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Message from the Symposium Chair

Dr. Gayani K. Nandasiri
University of Moratuwa,
Sri Lanka

It is with great pleasure that I am welcoming all the participants to the second annual Textile Engineering Research Symposium (TERS 2024) organized by the Department of Textile and Apparel Engineering University of Moratuwa. With the vision of promoting research in emerging fields of Textile and Apparel Engineering we organized this annual research symposium in the year 2023, as a meeting place of young talents and industry experts. Thus, we trust this will provide the much-needed connection between the industry and the university academics, the researchers to embark towards product incubation.

This year's symposium was opened for submissions of extended abstracts from diverse research domains of Textile and Apparel Engineering under 15 thematic areas including traditional textile processes, current trends in textiles, innovative technologies towards futuristics textiles and apparel.

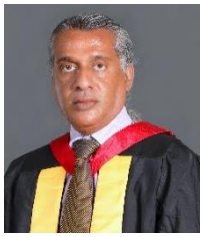
I would like to take this opportunity to firstly thank MAS Capital for coming forward as the main sponsor for the event, by helping to promote research culture and helping the students to disseminate their research findings to a wider audience. Further, I extend my gratitude to the local organizing committee of TERS 2024, the Textile Engineering Student Society (TESS), and the student organizers who have worked tirelessly in setting up the groundwork bringing this year's symposium to a reality. Further, I am much grateful to all the members of the review panel for their untiring efforts in reviewing the submitted extended abstracts and providing constructive feedback. Further, I extend my gratitude to the technical programme committee of the TERS2024 for finalizing the technical programme and organizing the technical sessions.

I would like to thank our keynote speaker Dr. Sameera Maheepala for his address on "the role of textiles in shaping the future of the apparel industry and the importance of research & innovation". Further my deepest appreciation goes to our distinguished keynote speaker Prof. Apurba Das from IIT Delhi for his address on "science behind clothing comfort".

Finally, I would like to acknowledge all the authors who have contributed to the TERS2024, we had about 18 extended abstracts accepted for the publication out of which 9 were selected for the technical sessions. Thank you for your wonderful scientific contributions to the symposium.

Dr. Gayani K. Nandasiri.
Symposium chair, TERS2024
Department of Textile and Apparel Engineering University of Moratuwa

Local Organizing Committee



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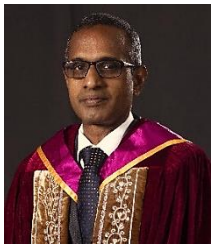

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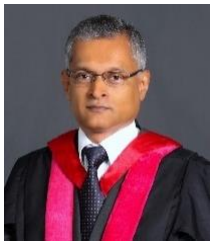

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Keynote: The Role of Textiles in shaping the future of the Garment Industry and the Importance of Research & Innovation.

Dr. Sameera Maheepala
Director Sourcing & Supply Chain
MAS Capital (Pvt) Ltd

Sustainability & Circular Economy
The keynote emphasized the industry's transition from linear to circular production models, focusing on recycling, reusing, and sustainable sourcing to minimize environmental impact. MAS Holdings demonstrated leadership in sustainable textiles by investing in bio-based fibers and recycled fabrics. Their commitment to eco-friendly practices has fostered long-term partnerships with prominent eco-conscious brands such as Patagonia and Nike.

Smart Textiles & Wearable Technology
The integration of technology into textiles is revolutionizing the garment industry, creating products that enhance functionality and performance. MAS has pioneered smart textiles, including smart bras and sportswear with built-in health monitoring and performance-tracking features. These innovations are expanding market opportunities and driving growth in wearable technology.

Customization & Quick Commerce
In response to evolving consumer demands, MAS has embraced on-demand production and personalization. By leveraging digital supply chains and advanced manufacturing technologies, the company delivers adaptive and customized solutions that cater to fast-changing market trends, transitioning away from traditional fast fashion models.

Economic Benefits of Textile Innovation
Innovative textiles offer opportunities for higher margins and entry into high-value markets such as technical and medical textiles. MAS's investments in advanced manufacturing, including automation and digital printing, have resulted in cost efficiencies, reduced waste, and faster time-to-market. These efforts have strengthened MAS's economic positioning and enhanced profitability.

Major Fields of Innovation
MAS has driven advancements in sustainable textiles, developing biodegradable materials and plant-based alternatives. Technical textiles, such as moisture-wicking, compression garments, and antimicrobial fabrics, have become key growth areas. Additionally, MAS has been at the forefront of smart textiles, integrating sensors and conductive fibers to produce garments with enhanced functionality for health monitoring and environmental adaptability.

Research & Development Achievements
The keynote highlighted MAS's significant contributions to textile research, including the development of zero-waste Olympic apparel and thermal materials for seamless knit garments. Computational design and athlete feedback have played a crucial role in shaping innovative products, demonstrating the importance of research in driving industry transformation.

Keynote: Science Behind Clothing Comfort

Prof. Apurba Das
Department of Textile and Fibre Engineering
IIT Delhi

The keynote presentation explored the intricate science of clothing comfort, focusing on the interaction between textiles, the human body, and the environment. Comfort was defined as a multidimensional concept encompassing physiological, psychological, and physical harmony. It was emphasized that clothing comfort is not a fixed property but varies with factors such as the environment, activity levels, and individual physiology.

Key Elements of Comfort

The keynote highlighted four core aspects of clothing comfort: thermo-physiological, sensorial, psychological, and fitting comfort. Thermo-physiological comfort addresses heat and moisture management, crucial for maintaining body temperature and avoiding discomfort caused by sweating or overheating. Sensorial comfort relates to tactile sensations such as softness, smoothness, or irritation caused by fabric properties. Psychological comfort includes factors like color, appearance, and drape, influencing perception and satisfaction. Fitting comfort focuses on how garment structure and design accommodate body movements and ensure ease of use.

Research and Practical Applications

The discussion emphasized the role of textile properties fiber type, yarn structure, and fabric design in achieving desired comfort levels. Parameters like thermal insulation, air permeability, and moisture transmission were identified as key contributors. Advanced techniques, such as objective fabric evaluation systems, were highlighted for their ability to measure and improve fabric performance. The interplay of heat and moisture during dynamic conditions, such as physical activity, was also explored, showcasing the complexity of maintaining comfort under varying circumstances.