

Hong Kong offers apparel-based anthropometric method to precisely measure tissue deformation

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Providing a systematic framework to correlate garment pressure with tissue response



Soft tissue deformation during body movement has long posed a challenge to achieving optimal garment fit and comfort, particularly in sportswear and functional medical wear. Researchers at The Hong Kong Polytechnic University (PolyU) have developed a novel anthropometric method that delivers highly accurate measurements to enhance the performance and design of compression-based apparel.

Prof. Joanne YIP, Associate Dean and Professor of the School of Fashion and Textiles at PolyU, and her research team pioneered this anthropometric method using image recognition algorithms to systematically access tissue deformation while minimising motion-related errors. The team also developed an analytical model to predict tissue deformation using the Boussinesq solution, based on elastic theory and stress function methodology. By leveraging image recognition algorithms, this innovation quantifies tissue deformation during movement, addressing a longstanding challenge in sportswear and wearable tech design.

Inaccurate deformation measurements, especially during motion, often lead to ill-fitting designs that undermine functionality. This innovative approach tackles the issue by minimising motion artifacts and providing a systematic framework to correlate garment pressure with tissue response, which is vital for optimising wearables' biochemical efficacy.

This innovative technology holds promising transformative potential for the industry, offering feasible and cost-effective applications. It can be integrated into existing CAD/CAM system to streamline prototyping and reduce reliance on trial-and-error fitting. By quantifying individual tissue response, this technique supports personalised garment design, particularly beneficial for medical compression wear tailored to specific patient needs. Additionally, the image-based tools reduce dependence on expensive motion-capture systems, making the approach accessible for small and medium-sized enterprises.