

How Fashion Tech Could Be the Coolest Weapon Against Climate Change

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For decades, fashion has been synonymous with glamour, aesthetics, and indulgence. But as global temperatures rise, clothing is taking on a far greater role—**survival gear against climate change**. With over **3.6 billion people vulnerable** to extreme heat and nearly **480,000 annual deaths from heat-related causes**, the way we design and wear clothes is no longer just about style, but about resilience.

Reimagining Clothing as Climate Infrastructure

A quiet yet groundbreaking revolution is taking place in Hong Kong. At *The Hong Kong Polytechnic University (PolyU)*, **Prof. Dahua Shou** and his team at the School of Fashion and Textiles are developing **intelligent, sustainable personal cooling systems** that could change the way we think about fashion.

Unlike passive cooling fabrics, which merely wick sweat or reflect sunlight, PolyU's designs treat garments as **dynamic systems**. By combining **thermodynamics, AI-driven wearables, and advanced textiles**, these smart garments actively regulate body temperature, predicting overheating and adjusting cooling power in real time.

From Prototype to Wardrobe: Fashion That Works Smarter

Prototypes already exist, and they're remarkably fashion-forward:

- **iActive™ sportswear** uses low-voltage “artificial sweat glands” and a root-like liquid network to eject sweat up to **3x faster** than the human body.
- **OmniCoolDry™ fabric** reflects solar and ground radiation while emitting mid-infrared body heat, reducing skin temperature by up to **5°C**.
- **SweatMD** channels perspiration through microfluidic yarns, monitoring biomarkers like glucose and potassium for insights into fatigue and hydration.

What makes these designs revolutionary is their **aesthetic plausibility**. Instead of bulky wires or battery packs, these garments are **lightweight, washable, and durable**, looking more like everyday sportswear or uniforms than wearable gadgets.

Sustainability at the Core

The environmental impact is equally promising. With **air conditioning responsible for 10% of global electricity use**—and demand expected to triple by 2050—personal cooling could drastically reduce dependence on energy-heavy systems. PolyU's smart garments even use **recyclable materials and solar-powered energy harvesting**, eliminating reliance on external grids.

Challenges and the Road Ahead

Of course, hurdles remain: heavy perspiration can reduce fabric efficiency, adaptive thermoregulation is complex across diverse climates, and standardised cooling metrics are still lacking. But the PolyU research offers a blueprint for how fashion-tech might mature—with **collaborations between textiles, electronics, and AI developers** making “intelligent fashion” a mainstream reality.

A New Era for Fashion

Fashion has always reflected the spirit of its time. Today, as **extreme heat becomes an existential threat**, clothing is evolving from a seasonal indulgence to **climate infrastructure**. The future of style may not just be about trends—it may be about survival.

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