

Tech

Fabric embedded with ‘miracle material’ harvests electricity from body movements

Fabric can be washed, folded and crumpled without performance degradation

Anthony Cuthbertson • 14 hours ago • [Comments](#)



NTU Singapore researchers created fabric capable of powering electronic devices through energy harvested from the body's movements (NTU Singapore)

Researchers have developed a fabric embedded with the “miracle material” perovskite, capable of harvesting **electricity** from the body's movements.

The fabric is able to turn vibrations and frictions “produced from the smallest body movements in everyday life” into enough electricity to power electronic devices, according to the research team from Nanyang Technological University (NTU) in Singapore.

One of biggest breakthroughs of the technology, described in a study published in the latest issue of the scientific journal *Advanced Materials*, is that the electricity-generating fabric is durable enough to be used for everyday clothing.

“There have been many attempts to develop fabric or garments that can harvest energy from movement, but a big challenge has been to develop something that does not degrade in function after being washed, and at the same time retains excellent electrical output,” said Professor Lee Pooi See, a materials scientist at NTU who led the research.

“In our study, we demonstrated that our prototype continues to function well after washing and crumpling. We think it could be woven into t-shirts or integrated into soles of shoes to collect energy from the body's smallest movements, piping electricity to mobile devices.”



A prototype of the fabric generates 100 milliwatts of electricity per square metre – enough to power a small LED light – via two methods: through pressing or squeezing, and when it comes into friction with other materials like skin.

It achieves this by combining an electrical charge-producing polymer with a lead-free perovskite – a promising material that has been hailed for its revolutionary potential in **everything from renewable energy production to ultra-high-speed communications**.

“Embedding perovskites in [the polymer] increases the prototype’s electrical output,” said NTU PhD student Jiang Feng, who was part of the research team.

“We opted for lead-free perovskites as a more environmentally friendly option. While perovskites are brittle by nature, integrating them into the polymer gives the perovskites exceptional mechanical durability and flexibility. The polymer also acts as an extra layer of protection to the perovskites, adding to its mechanical property and stability.”

