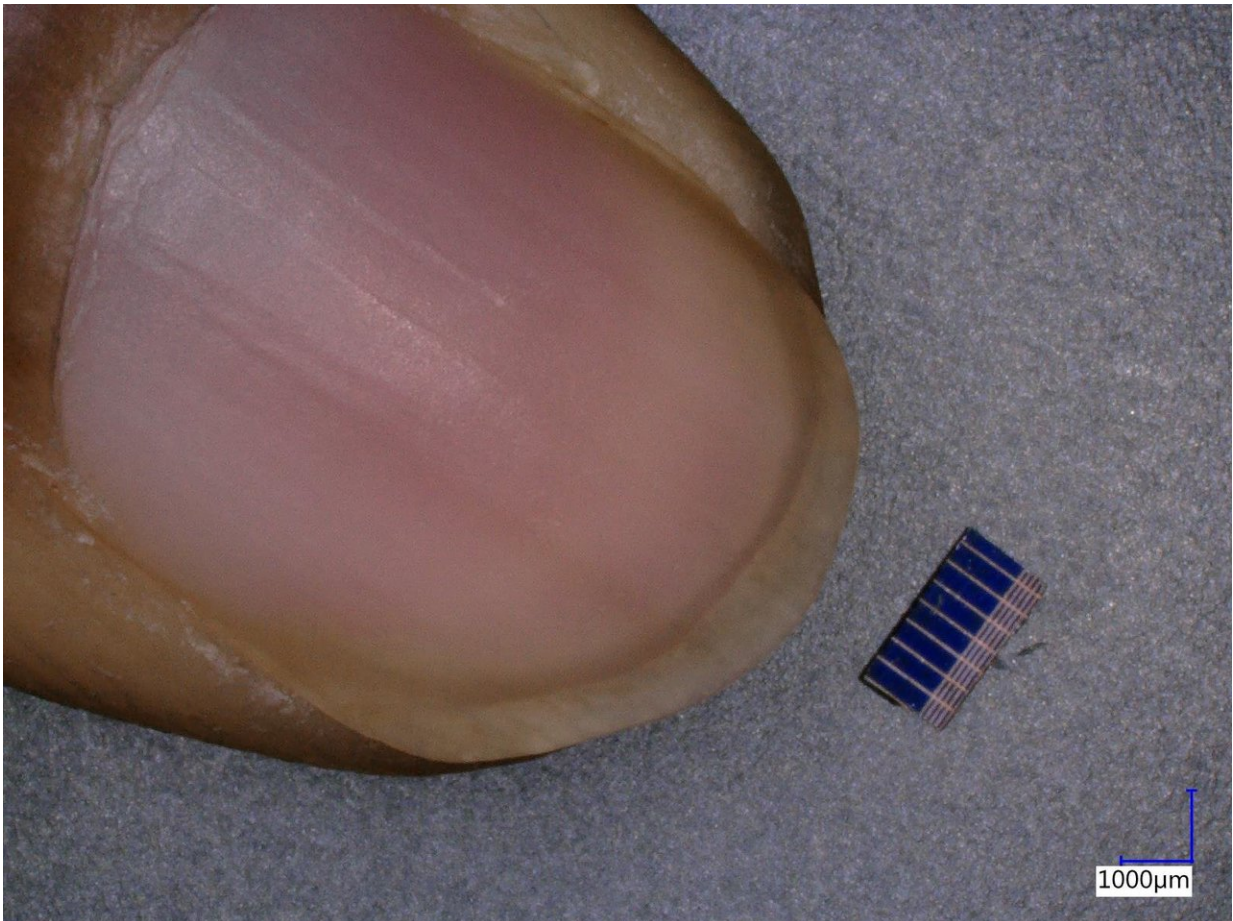


Flea-sized solar panels embedded in clothes can charge a mobile phone

December 13 2018



Credit: Nottingham Trent University

Clothing embedded with tiny solar cells the size of a flea can allow

wearers to generate electricity on the move and charge items like mobile phones and smartwatches.

Nottingham Trent University has developed a way to embed miniaturised [solar cells](#) into yarn that can then be knitted and woven into textiles. The technology has been tested and proven to charge a mobile phone and a Fitbit. The [cells](#) are encapsulated in a resin which allows the [textile](#) fabric to be washed and worn like any other form of clothing.

Measuring only three millimetres in length and 1.5 millimetres in width, the cells are almost invisible to the naked eye and cannot be felt by the wearer. For all intents and purposes, garments appear exactly the same as any other form of clothing despite having the capability to generate electricity.

Project lead Professor Tilak Dias, of the School of Art & Design, said: "By embedding miniaturised solar cells into yarn we can create clothing and fabric that generate power in a sustainable way. The clothing would look and behave like any other textile, but within the fibres would be a network of miniaturised cells which are creating electricity. This could do away with the need to plug items into wall sockets and reduce the demand on the grid while cutting carbon emissions. The electrical power demand for smart e-textiles has always been its Achilles heel and this technology will allow people to use smart textiles while on the move."

Up to 200 miniaturised cells can generate 2.5-10 volts and up to 80 miliwatts in power. The university's Advanced Textiles Research Group made a proof of concept textile of 5cm by 5cm size with 200 cells.

This proved powerful enough to charge a [mobile phone](#) and a Fitbit. Researchers say if 2,000 solar cells were incorporated into a textile it would generate enough power to charge a smart phone.

Researcher Achala Satharasinghe, who developed the prototype as part of his Ph.D. at the university, said: "This is an exciting technology which could revolutionise the way we think about [solar power](#), clothing and wearable technology. With the availability of miniaturised solar cells we can generate power in a range of new ways, by utilising things like [clothing](#), fashion accessories, textiles and more. It will allow mobile devices to be charged in environmentally-friendly ways which are more convenient for consumers than ever before."

Provided by Nottingham Trent University

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