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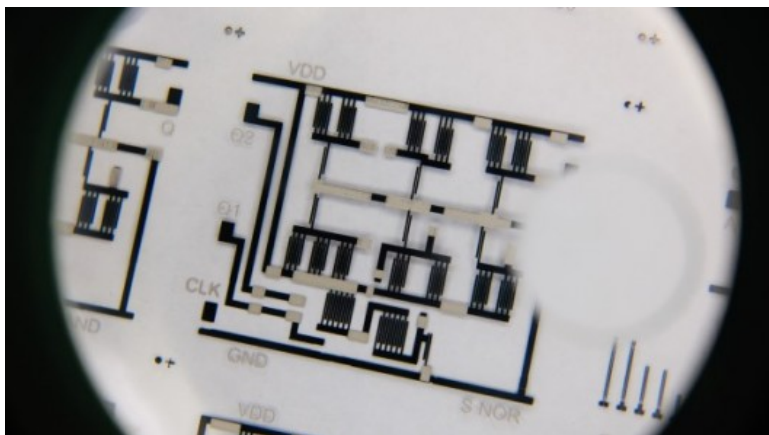
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Disposable electronic circuits produced with a T-shirt printer

By [Ben Coxworth](#)
November 17, 2014

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Some of the printed circuits, perhaps coming to a milk carton near you

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Someday soon, your milk carton may be able to tell you that the milk has spoiled, or your bandage may indicate that it needs changing. These and other things could be made possible by a new technique developed at Singapore's Nanyang Technological University, which allows disposable electronics to be printed on a variety of surfaces, using an existing T-shirt printer.

Developed by a team led by Prof. Joseph Chang, the system incorporates building materials including "silver nanoparticles, carbon and plastics." These are applied in layers to flexible materials such as paper, plastic and aluminum foil.

The researchers have printed off complete electrical circuits containing resistors, transistors and capacitors. These circuits have included a 4-bit digital-to-analog converter (typically used for converting digital signals into sound), and RFID tags.

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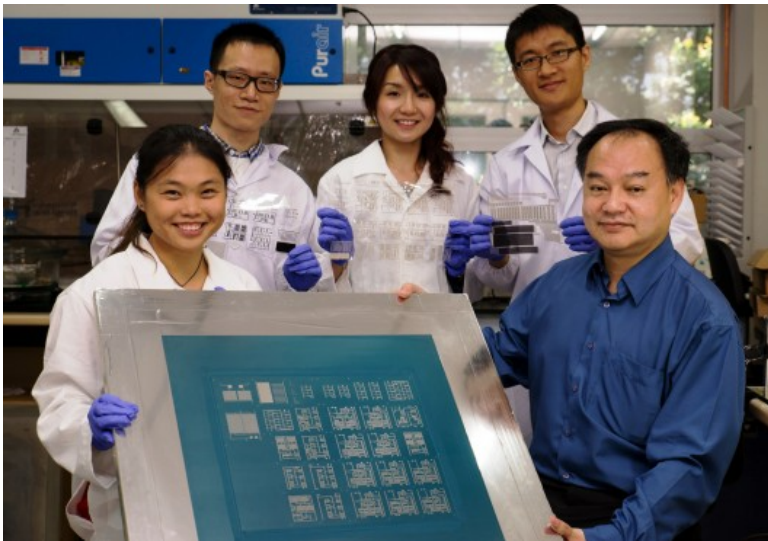
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Prof. Joseph Chang (right) and his team at Nanyang Technological University

According to Chang, the circuits can be printed on demand in minutes for a few cents each, and the system can be scaled to produce large or small electronics. He also states that it's an entirely green process, requiring no toxic chemicals or oxidizing agents ... although studies have indicated that silver nanoparticles [aren't entirely innocuous](#).

A spin-off company has been formed to commercialize the technology, which has reportedly already received interest from a multinational biomedical company.

Source: [Nanyang Technological University](#)

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About the Author

An experienced freelance writer, videographer and television producer, Ben's interest in all forms of innovation is particularly fanatical when it comes to human-powered transportation, film-making gear, environmentally-friendly technologies and anything that's designed to go underwater. He lives in Edmonton, Alberta, where he spends a lot of time going over the handlebars of his mountain bike, hanging out in off-leash parks, and wishing the Pacific Ocean wasn't so far away. [All articles by Ben Coxworth](#)



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