



A research team from the National University of Singapore has created a skin-like material that is transparent and water-resistant, and can repair itself in air and even under water. Using this material to make phone screens has a big plus: cracks on the screen would disappear within a week. The team members include (from left) Mr Li Si, Dr Lee Wang Wei, Dr Tan Yu Jun, Assistant Professor Benjamin Tee and Mr Guo Hongchen. PHOTO: NATIONAL UNIVERSITY OF SINGAPORE

Phone screens could be self-healing

Eight scientists from NUS create electronic skins that mimic the functions of human, animal skin

Cheryl Teh

Repairing smartphone touch screens may one day be a thing of the past. The reason: Future smartphones may have screens that “heal” themselves.

A local research team has created a skin-like material that is transparent and water-resistant, and can repair itself in air and even under water.

Using this material to make phone screens has a big plus: cracks on the screen would disappear within a week.

It is unlike many other self-healing materials which are not transparent and do not work well when wet, says the research team.

The scientists believe that the material can also be used to 3D-print custom-designed prosthetics to create artificial body parts that

will heal, just like skin would.

The team of eight scientists from the National University of Singapore (NUS) were intrigued and inspired while watching underwater invertebrates like the jellyfish.

After a year of research and development, they succeeded in creating electronic skins: self-healing and flexible electronic devices that mimic the functions of human and animal skin.

Like the jellyfish, the electronic skin is transparent, stretchable and can heal itself.

It also mimics the hydrophobic, or water-repelling, quality of the jellyfish, while being touch-sensitive as well.

The researchers say this electronic skin has a gel-like consistency, and is soft and stretchable enough to be moulded into different shapes and sizes.

And the material heals itself over time by “sticking” back together and sealing over a cut – the way real human skin does.

The material was developed by Assistant Professor Benjamin Tee and his team from the department

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of materials science and engineering at the NUS Faculty of Engineering.

Prof Tee said his team’s research broke new ground in the field: They succeeded in identifying and overcoming some key obstacles faced in the development of electronic skins.

“One of the challenges with many self-healing materials today is that they are not transparent and they do not work efficiently when wet,” he said.

“These drawbacks make them less useful for electronic applications such as touch screens, which often need to be used in wet weather conditions,” added Prof Tee, who is also from the university’s department of electrical and computer engineering, and the Biomedical Institute for Global Health Research and Technology (BIG-HEART).

This is one of Prof Tee’s new projects, continuing his 2012 work on self-healing electronic skins.

He said that having a smartphone screen that could heal itself would drastically reduce electronic waste.

According to survey results from Nanyang Technological University reported by *The Straits Times* this month, only one in 10 young Singaporeans recycles e-waste, and 34 per cent of them do it wrongly.

And last year, the National Environment Agency estimated that approximately 60,000 tonnes of e-waste were generated in Singapore yearly. That would add up to about 11kg of e-waste per person, or around 63 iPhone X devices a year.

“If electronic devices are made from intelligent materials that can self-repair, we can reduce the amount of electronics being thrown away,” Prof Tee said.

His team will continue to look into new ways of using the material. They also hope to create electronic devices made from intelligent materials that can perform self-repair functions to reduce the amount of electronic waste in the world.

They are now in search of partners who can help launch the electronic skin in the market.

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