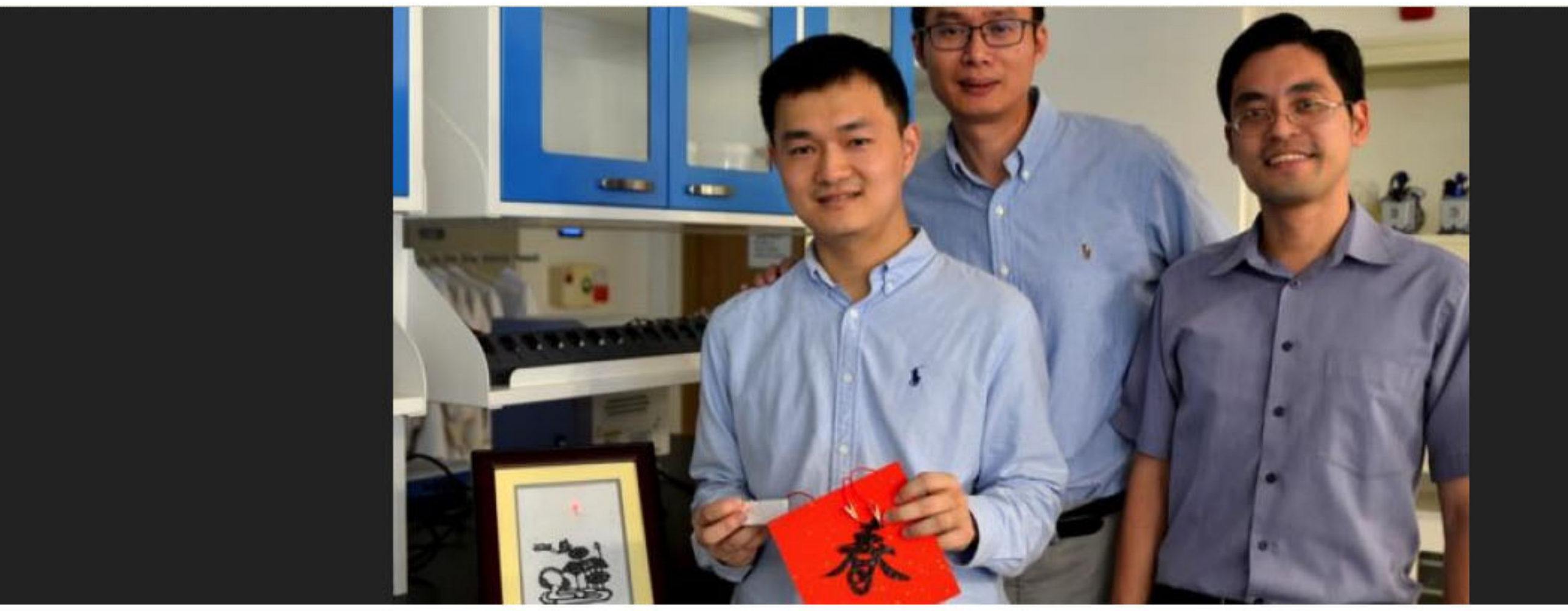

TECH

Power dressing: NTU scientists create fabric that generates electricity

By: PC Lee
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SINGAPORE (Jan 30): Imagine soldiers wearing uniforms that can power their night vision goggles and personal weapons.

Or sportsmen wearing jerseys with embedded sensors for health and sports performance diagnostics.

Well, scientists at Singapore's Nanyang Technological University have created the fabric-like supercapacitor which works like a fast-charging battery and can be recharged many times.

More importantly, the fabric can be cut, folded or stretched.

While existing stretchable supercapacitors are made into predetermined designs and structures, the new invention can be stretched multi-directionally, and is less likely to be mismatched when joined up to other electrical components.

According to Professor Chen Xiaodong of the School of Materials Science & Engineering who led the research, the supercapacitor has the ability to store an electrical charge four times higher than most existing stretchable supercapacitors.

Even when stretched to four times its original length and after 10,000 stretch-and-release cycles, the supercapacitor maintains nearly 98% of its initial ability to store electrical energy.

Experiments done by Prof Chen and his team also showed that the supercapacitor was able to provide a stable stream of signals even when the arm was swinging.

The team believes that the editable supercapacitor could be easily mass-produced as it uses existing manufacturing technologies. It is estimated that production cost will be low, estimated at about 13 cents to produce 1 sq cm of the material.

Professor Chen says, “A reliable and editable supercapacitor is important for development of the wearable electronics industry. It also opens up all sorts of possibilities in the realm of the ‘Internet-of-Things’ when wearable electronics can reliably power themselves and connect and communicate with appliances in the home and other environments."

The supercapacitor is made of strengthened manganese dioxide nanowire composite material. While manganese dioxide is a common material for supercapacitors, the ultra-long nanowire structure, strengthened with a network of carbon nanotubes and nanocellulose fibres, allows the electrodes to withstand the associated strains during the customisation process.

The NTU team has filed a patent for the technology.

NANYANG TECHNOLOGICAL UNIVERSITY (NTU) FABRIC-LIKE SUPERCAPACITOR