Supporting information

Multidimensional Hierarchical Fabric-based Supercapacitor With Bionic Fiber Micro-arrays for Smart Wearable Electronic Textiles

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Fig. S1. The schematic diagram of the multidimensional hierarchical fabric.

The concept of “multidimensional hierarchical” could be referred to two aspects. The “multidimensional” means that the fabric is consisted of two-dimensional planar fabric and three-dimensional fiber micro-arrays, the two different dimensional structure combine effectively with each other and consequently form the multidimensional fabric. And the “hierarchical” means that the fabric could be divided into two sections, the upper fiber micro-arrays and lower knitting substrate as shown in Fig. S1.

Fig. S2. Typical cross surface morphology SEM images of the micro-array with (a) small and (b) large magnifications.

The thickness of graphene layer and PEDOT layer on individual fiber array was
characterized in our revised manuscript. As shown in Fig. S2(a) and (b), the thickness of the GNS layer and PEDOT layer could be obtained to be around 3.03 μm and 2.11 μm respectively.

![Image of a darkened box with an illuminance meter reading and brightness graphs]

**Fig. S3.** (a) Photograph of the darkened box, (b) plot of the brightness change, and (c)-(h) photographs of the brightness change LEDs with time.

We established a self-made device to investigate the working time of our SCs as shown in Fig. S4(a), the illuminance meter can record real-time brightness values in the dark box. After charged at a potential of 2.4 V, the fabric-based SCs could light the 25 red LEDs with a logo of “QDU” for 58 seconds, and brightness curves of SCs is gradually decreased with the testing time as illustrated in Fig. S3(b).
Fig. S4. The sheet resistivity values of the fabric after each spraying.

Fig. S4 exhibits the change of sheet resistivity of the fabric with the increasing of spraying number. The obtained sheet resistivity after spraying graphene for 10 times is 27.43 $\Omega/$cm$^2$, which we think is suitable for our application. Then after the deposition of PEDOT: PSS aqueous dispersion for 5 times, the sheet resistivity of G/PHSC could reach 5.97 $\Omega/$cm$^2$. 