Electronic Supplementary Information

A highly stretchable and transparent silver nanowire/thermoplastic polyurethane film strain sensor for human motion monitoring

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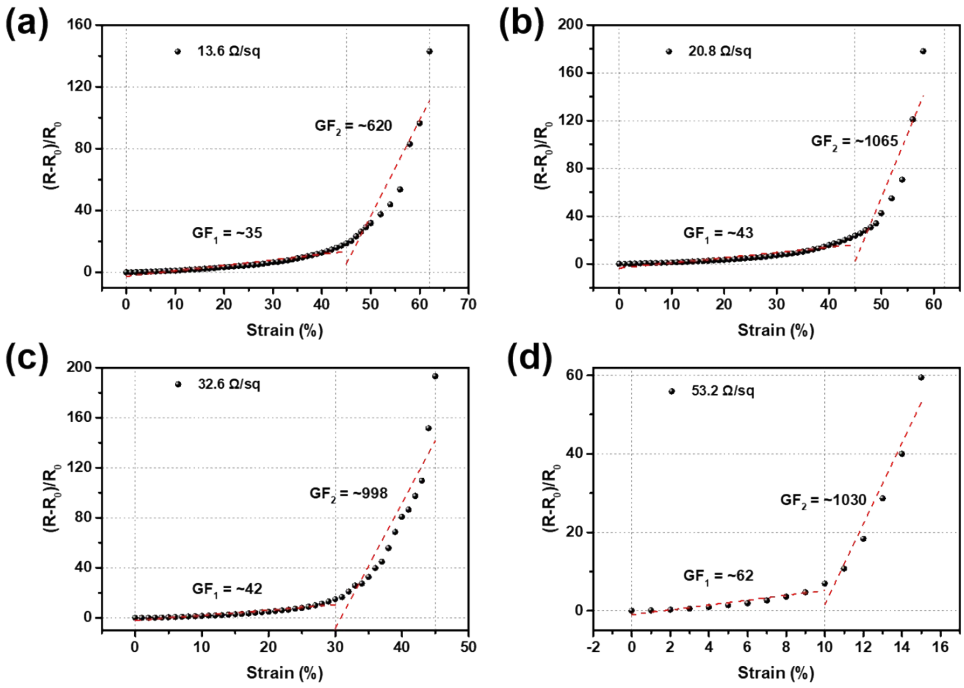

Fig. S1. Gauge factor of AgNW/TPU strain sensor with different sheet resistance.

As shown in Fig. S1, with the sheet resistance of the strain sensor increased, the strain sensor cannot withstand larger strain. For example, the strain sensor with sheet resistance of 53.2 Ω sq^{-1}, 32.6 Ω sq^{-1}, 20.8 Ω sq^{-1}, 13.6 Ω sq^{-1} failed at the strain of 15%, 45%, 58% and 63%, respectively. Meanwhile, the strain sensor (53.2 Ω sq^{-1}) exhibited a larger GF than other strain sensors during the initial stretching stage.

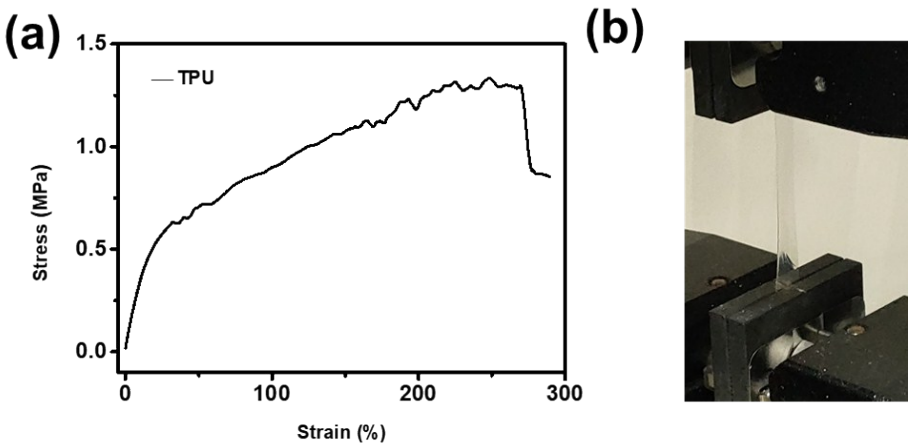

Fig. S2 (a) Stress strain curves of pure TPU film. (b) Photograph of stress test machine.

The stress-strain curve of pure TPU film was shown in Fig. S2a, which illustrated that TPU film possessed high elasticity with the maximum strain of 270%. Fig. S2b shows the stress test machine used in this work (Instron 5569A universal testing machine).

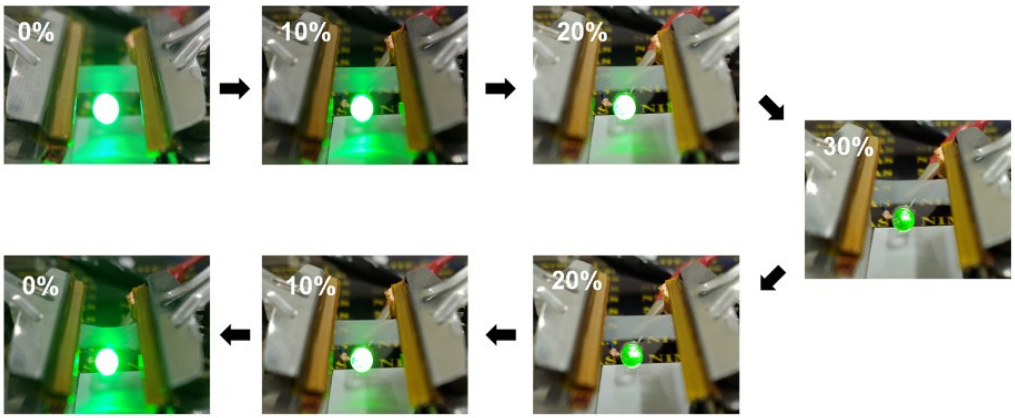

Fig. S3 Brightness of the LED changed with tensile strain of AgNW/TPU film

The resistance of the sensor gradually increases during the process of being stretched, which resulted the LED lamp became darker gradually. As the composite film recovered to unstressed status, the resistance decreased and the LED light gradually became brighter, as shown in Fig. S3.

Table 1. Comparison the performance of the sensor.

Polymer matrix	Conductive filler	Processing technique	Transmittance	Sensing range	GF	Ref
PU fibers	AgNWs	Coating	\	400%	\	1
PU fibers	AgNWs	Transfer	\	150%	9557	2
PU fibers	Ag nanoparticles		\	200%	659	3
TPU nanofibrous	PANI	Electrospinning/In situ polymerization	\	165%	\	4
TPU fibers	AgNWs	Co-Spinning	\	786%	\	5
TPU fibers	Carbon nanotubes	Wet Spinning	\	100%	2800	6
TPU foams	Graphene	TIPS	\	90%	12.24	7
PDMS	AgNWs	Transfer	\	70%	2-14	8
PDMS	AgNWs	Laser-patterning	88.3%	150%	846	9
PDMS	PEDOT:PSS AgNWs	Transfer	\	50%	6.5-8.0	10
PU-PDMS	AgNWs	Dip-coating	\	50%	\	11
TPU	AgNWs	transfer-printing	80%	85%	20-337	This work

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