Supporting information for

Superhydrophobic stretchable sensor based on interfacially self-assembled carbon nanotube film for self-sensing drag-reduction shipping

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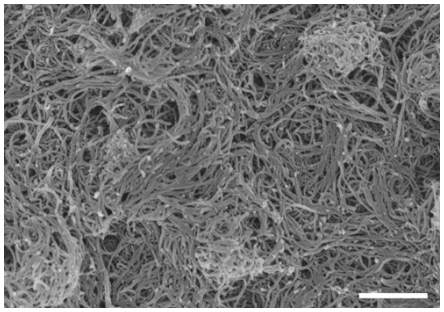

Fig. S1 The SEM image of the interfacially self-assembled CNT film.

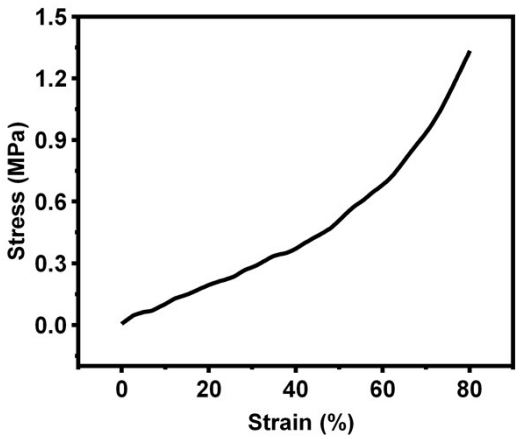

Fig. S2 The mechanical characterization of the integrated composite film.

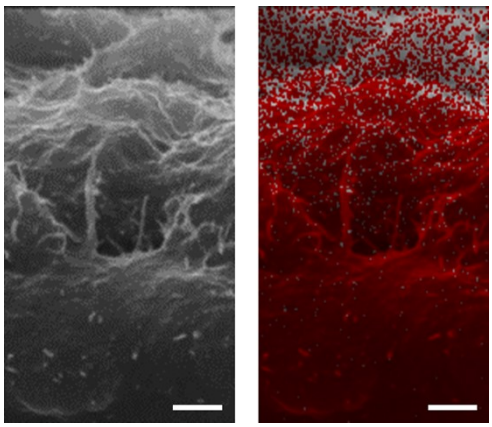

Fig. S3 The cross-sectional SEM image and silicon elements analysis of the integrated composite film. Scale bar: 1 μm.

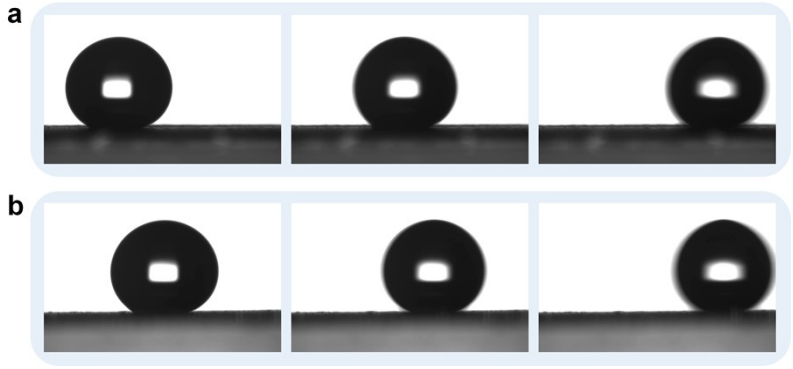

Fig. S4 (a) The rolling processes of the water droplet on the superhydrophobic surface of the four-layer sample (sliding angle 6.3°) were recorded. (b) The rolling processes of the water droplet on the superhydrophobic surface of the five-layer sample (sliding angle 4.2°) were recorded.

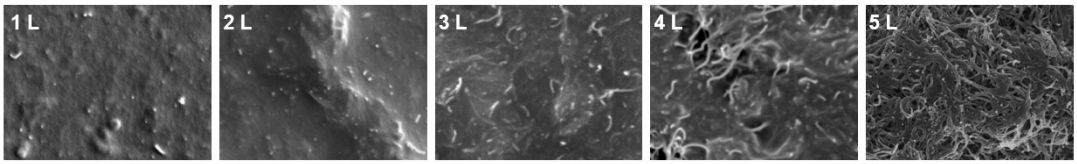

Fig. S5 The morphological characterizations of the composite films with different layers observed by SEM.

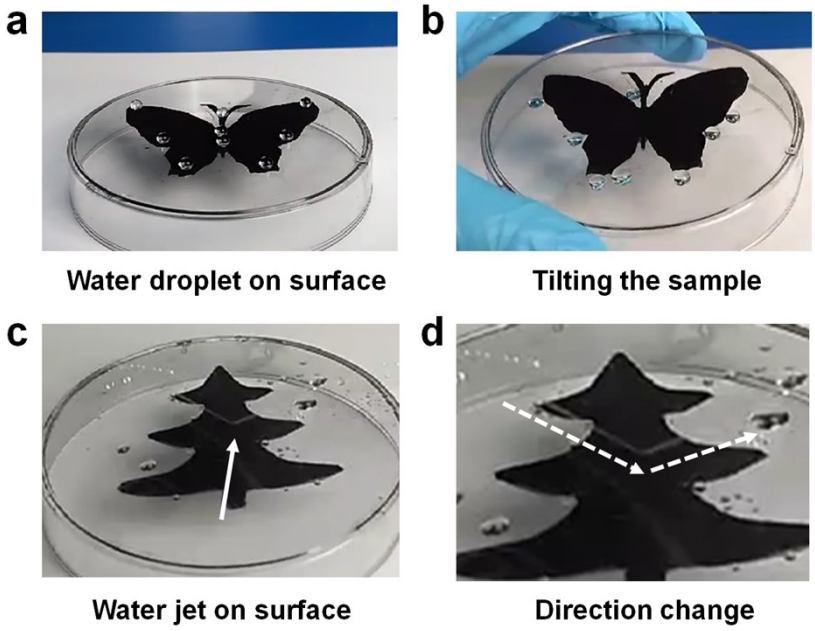

Fig. S6 (a)-(b) The water droplets placed on the sample rolled off the patterned superhydrophobic surface by tilting the sample. (c)-(d) Direction change of the water jet on the patterned superhydrophobic surface.

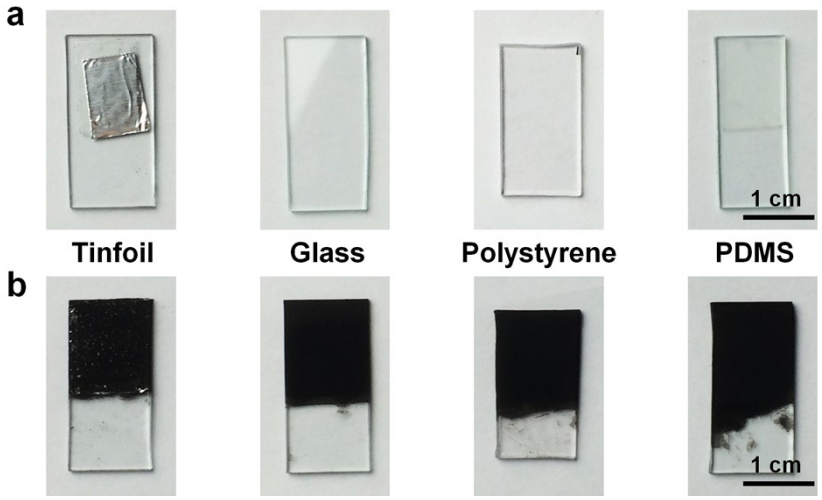

Fig. S7 The optical photographs of the pristine (a) and treated solid substrates (b) of different types of material, including tinfoil, glass, polystyrene and PDMS.

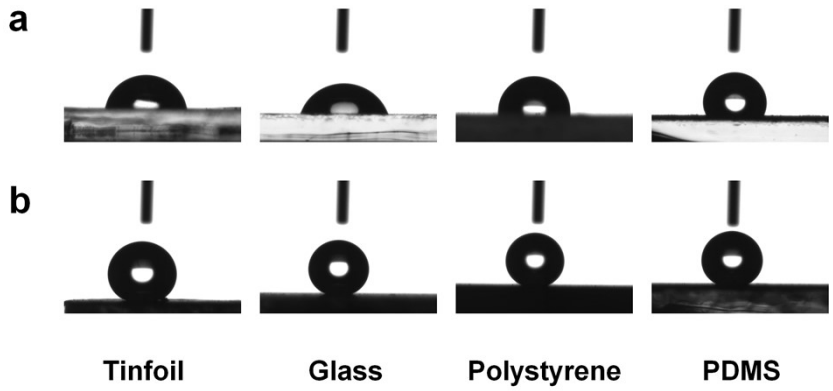

Fig. S8 The typical images of water droplets on the different types of solid substrates before and after modified process.

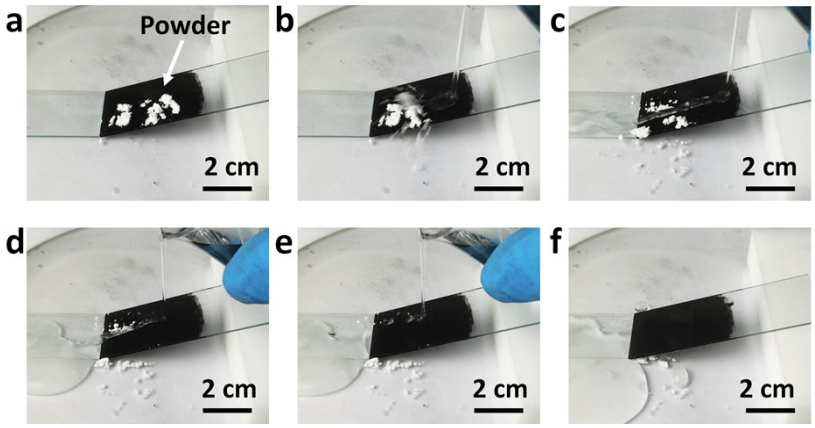

Fig. S9 Self-cleaning performance of the superhydrophobic surface fabricated on the glass substrate. Powders were put on the superhydrophobic surface and then flushed with water.

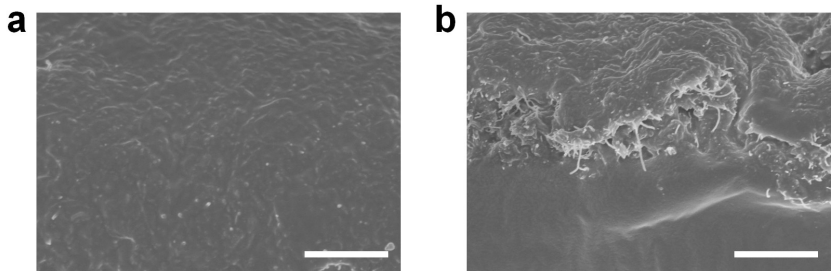

Fig. S10 (a) The SEM image showing the surface morphology of the f-CNT/PDMS composite film. Scale bar: 2 μm. (b) The SEM image showing the cross-sectional morphology of the f-CNT/PDMS composite film. Scale bar: 2 μm.

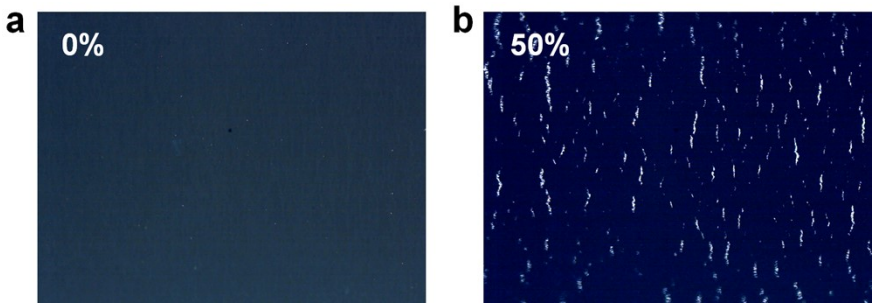

Fig. S11 The opening (a) and closing (b) of microcracks in the f-CNT/PDMS composite film under external tensile strains.

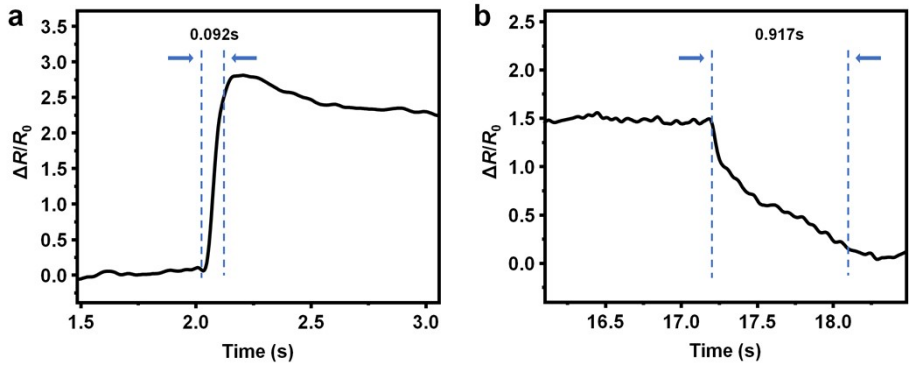

Fig. S12 The response time (a) and the recovery time (b) of the stretchable sensors.

Fig. S13 The artificial boat without superhydrophobic properties sank easily after loading cargo.

Table S1 The WCAs of the solid substrates of different material types before and after being treated.

Types	WCA (°)			
	Tinfoil	**Glass**	**Polystyrene**	**PDMS**
Pristine sample	83.6	72.4	98.4	114.0
Treated sample	150.8	152.7	154.0	152.1