

Supporting Information

Presenting the Shape of Sound Through a Dual-Mode Strain/Tactile Sensor

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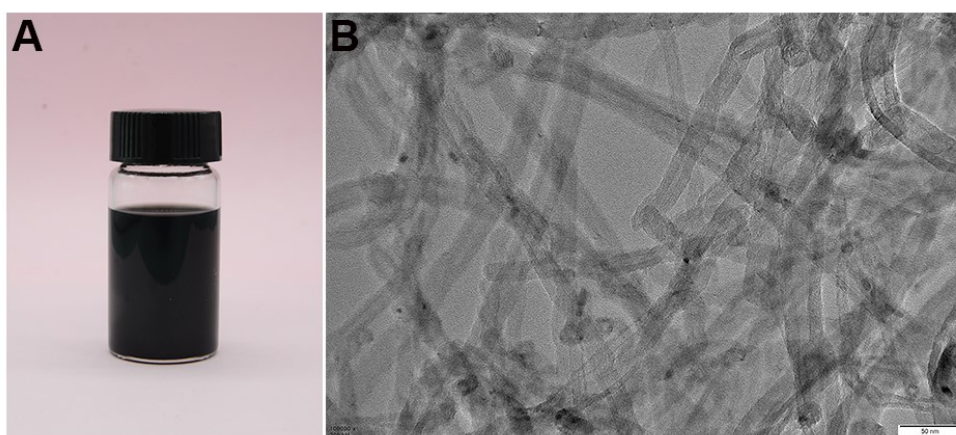


Figure S1. (A) Digital photograph of CNTs dispersion. (B) TEM image of CNTs.



Figure S2. Digital photographs of CNTs/OBCs microfibrous conductor being rubbed on the palm.

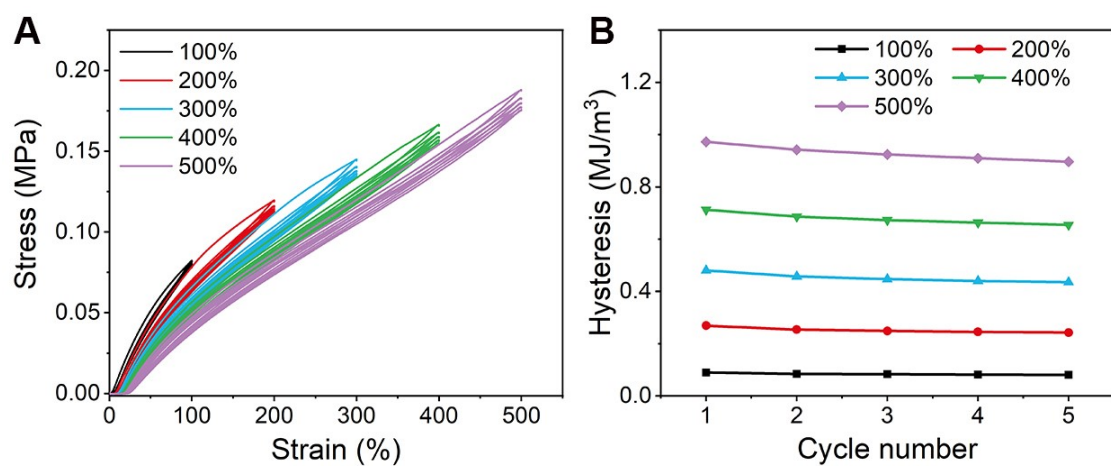


Figure S3. Strain-stress curves and corresponding hysteresis of the initial five cycles of OBCs under different strains.

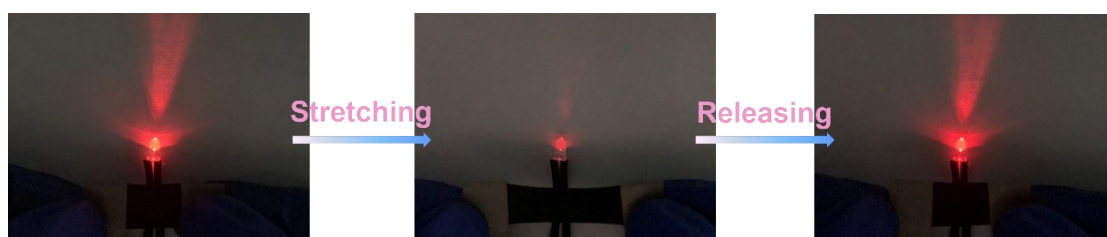


Figure S4. Photographs displaying the stretching and releasing of the CNTs/OBCs conductor can effectively control the light intensity of the LED bulb.

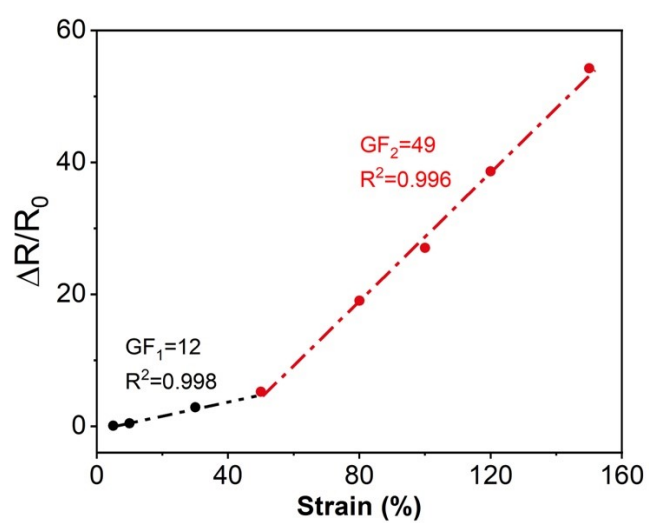


Figure S5. Resistance versus strain plot of CNTs/OBCs.

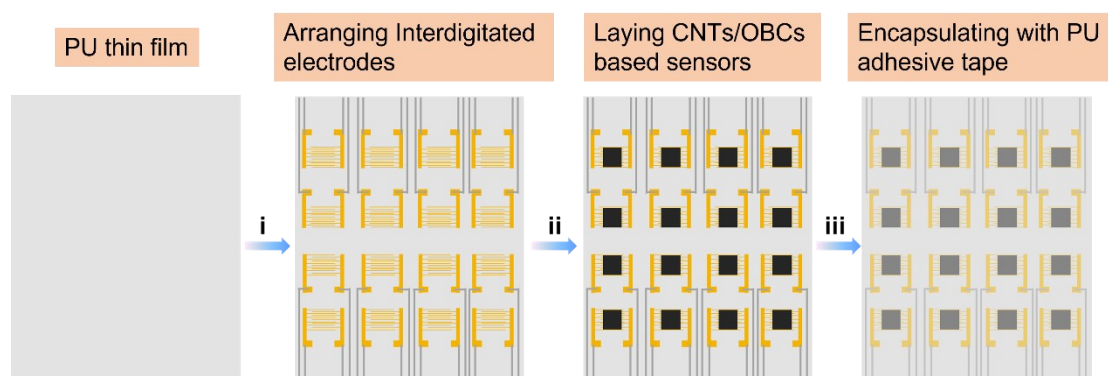


Figure S6. Construction of the 4×4 pixels E-skin.

Table S1. Performance comparison between different strain sensors.

Matrix	Conductive filler	Minimum detection (%)	Maximum range (%)	Maximum GF value	Mechanical stability	Ref.
PDMS film	AgNWs	0.5	35	> 20	N.A.	¹
PDMS film	CNTs	1.25	20	1140	2000	²
PDMS film	CNTs/GNPs	N.A.	50	7.04	1000	³
TPU film	Graphene	0.5	100	79	6000	⁴
TPU fiber	CNTs	N.A.	320	97.5	9700	⁵
TPU mat	AgNWs	N.A.	200	338.47	N.A.	⁶
SEBS film	Graphene/black phosphorous	0.023	20	2765	18400	⁷
SEBS filament	CNTs	N.A.	250	17.36	1976	⁸
SEBS fiber	Few-layered graphene	5	110	546	N.A.	⁹
3D printed PLA strip	CNTs	0.5	95	1342	2300	¹⁰
AIE sensor	CNTs	N.A.	> 100	1665.9	10000	¹¹
Carbonized leather	Carbon flake	0.005	~3	2009.5	N.A.	¹²
UV/O ₃ -cracked strain sensor	CNTs	N.A.	100	1020.2	10000	¹³
OBCs	CNTs	0.074	350	6293	10000	This work

Table S2. Performance comparison between different tactile sensors.

Materials	Sensitivity (kPa ⁻¹)	Pressure range (kPa)	Response/recovery times (ms)	Mechanical stability	Ref.
Graphene sheets with polyimide film	0.0045	0-50	N.A.	N.A.	14
CNT/rGO/PU foam	0.022, 0.088 and 0.034	0-48.8	N.A.	5000	15
PVA/H ₂ SO ₄ /PU sponge	0.052, 0.08 and 0.013	0-15	175/186	1325	16
MXene/CS/PU foam	0.014, 0.015 and 0.001	0-48.8	N.A.	5000	17
rGO/PI sponge	0.18 and 0.023	0-6.5	N.A.	2000	18
CNTs/OBCs	0.036 and 0.073	0-70	30/60	10000	This work

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