Supporting Information

Stretchable and compressible strain sensors basing on carbon nanotube meshes

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This file includes Figs. S1 to S10.

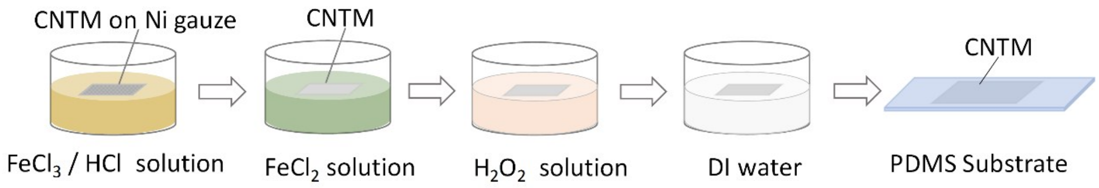

Figure S1. Schematic diagram of preparation of CNT meshes and stretchable CNTM strain sensors.

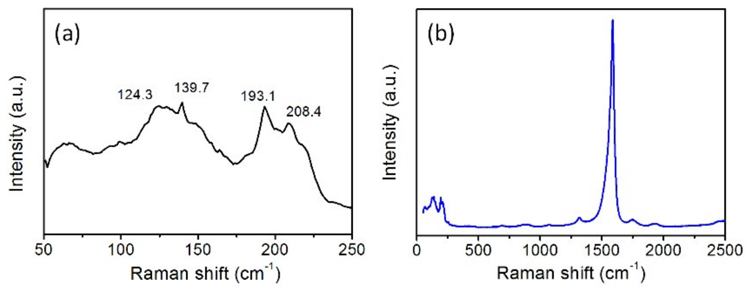

Figure S2. Raman spectrum of the CNT mesh. (a) Radial breathing mode, (b) full spectrum from 0 to 2500 cm^{-1}. There are RBM at 124.3, 139.7, 193.1, 208.4 cm^{-1}, corresponding to CNTs with diameter of 1.8 nm, 1.6 nm, 1.16 nm and 1.07 nm, respectively. The Raman spectrum of the CNTM shows that the samples contain mainly single- and double-walled CNTs.

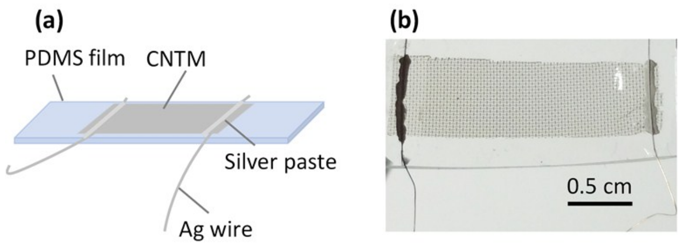

Figure S3. (a) Structure and optical (b) image of the stretchable CNTM strain sensor.

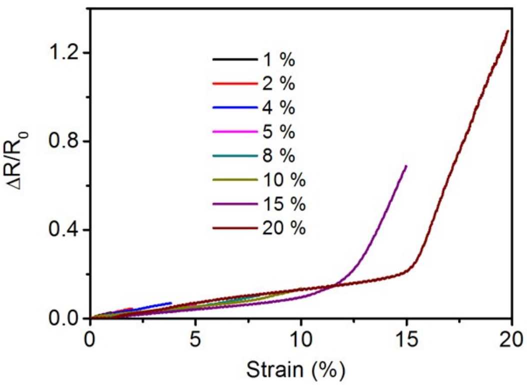

Figure S4. Plots of relative change in resistance of a stretchable CNTM strain sensor depending on strains.

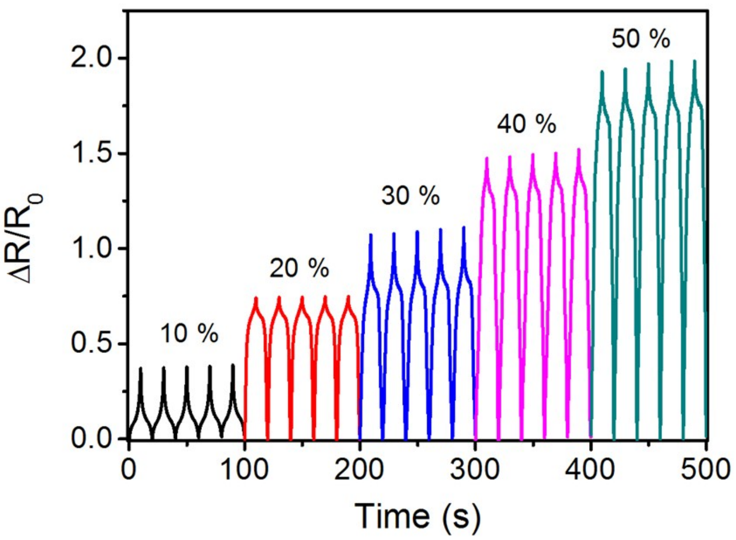

Figure S5. Measurement of the relative change in resistance to large stretching strains from 10% to 50% for 5 cycles.

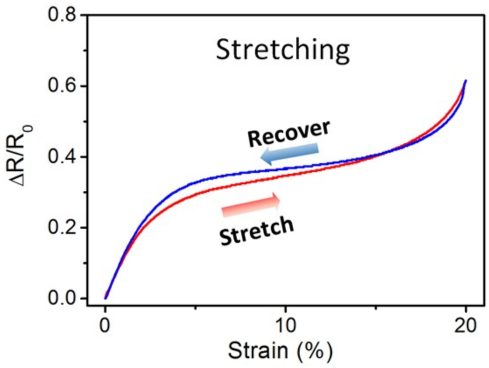

Figure S6. Plots of $\Delta R/R_0$ versus strain during the stretching and recovering processes. It shows that the stretchable CNTM strain sensor has slight hysteresis which derives from creep characteristics of the PDMS substrate.

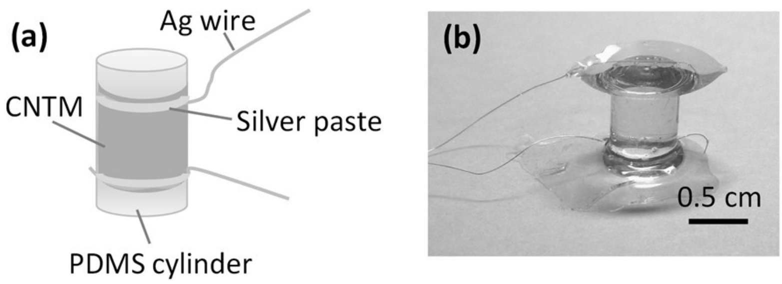

Figure S7. (a) Structure and (b) optical image of the compressible CNTM strain sensor.

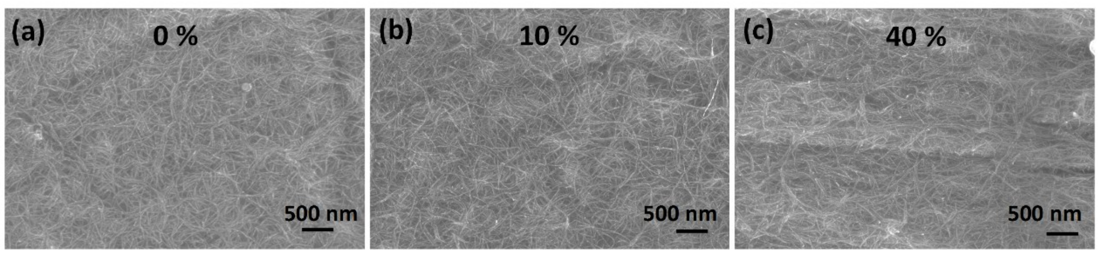

Figure S8. SEM images of a compressible CNTM strain sensor being compressed to various strains. (a) 0%, (b)10%, (c) 40%.

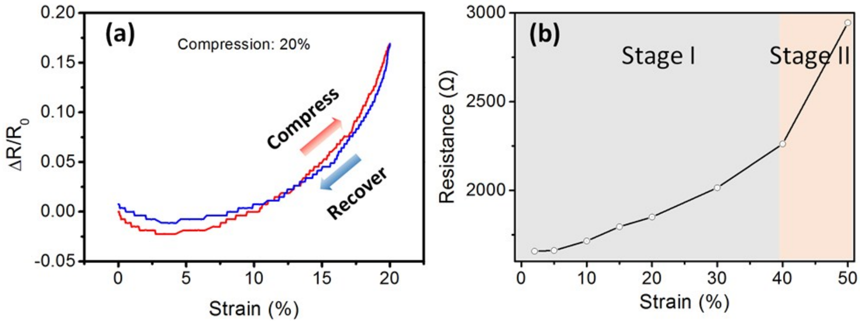

Figure S9. (a) Plots of $\Delta R/R_0$ versus strain during the compressing and recovering processes. It shows that the compressible CNTM strain sensor also has slight hysteresis. (b) The dependence of resistance of a compressible sensor on the strain.

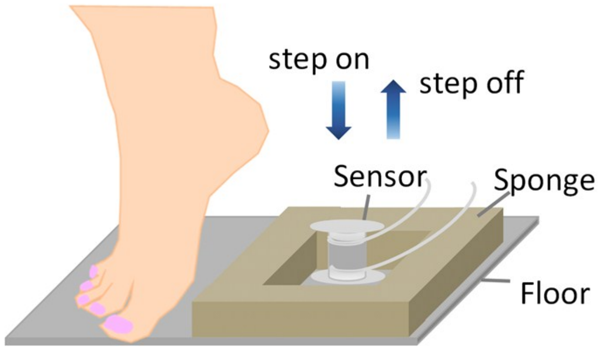

Figure S10. Schematic illustration of walking (running) on the compressible strain sensor.