

Supplementary Information

Ultrasensitive Flexible Pressure Sensor Toward Multimodal Wearable

Electronic Skins Based on Large-Scale Polystyrene Ball@Reduced-Graphene-

Oxide Core-Shell Nanoparticles

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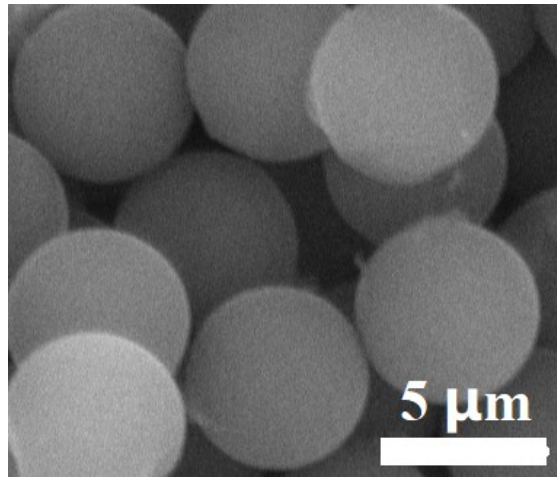


Figure S1 A SEM image of PS ball

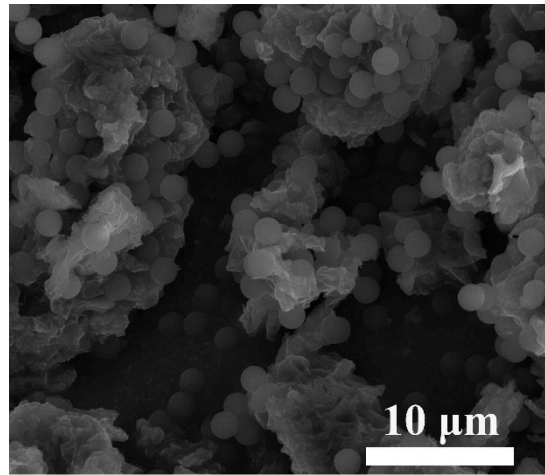


Figure S2 The best result of the rGO covering on 2 μm diameter PS balls. This small PS ball could not prevent rGO from reuniting.

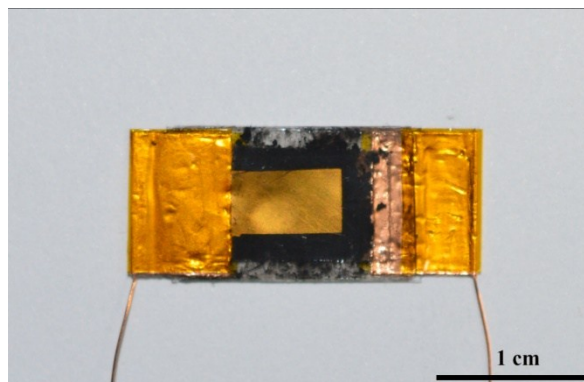


Figure S3 An optical image of sandwiched structure pressure sensor

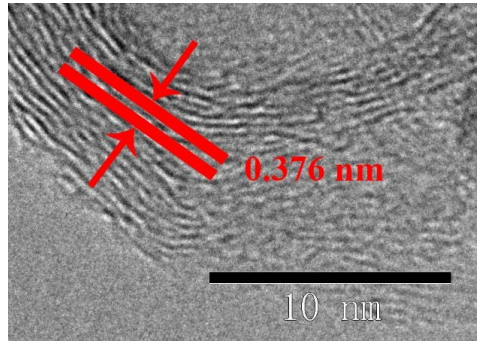


Figure S4 The high-resolution TEM image of the protruding rGO sheets.

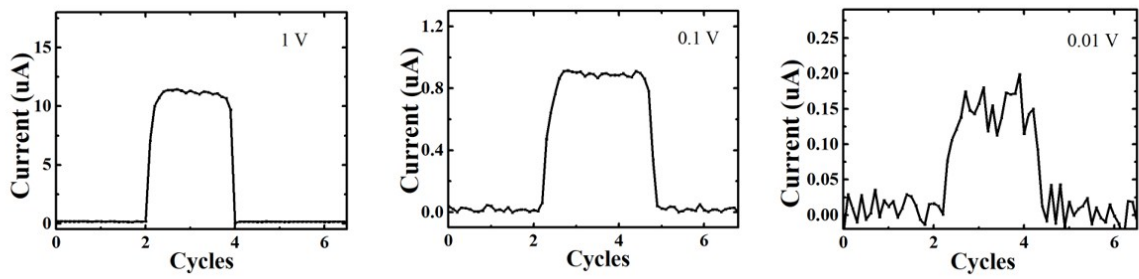


Figure S5 The current responses under 1, 0.1 and 0.01V voltage when loading a pressure of 2 kPa.

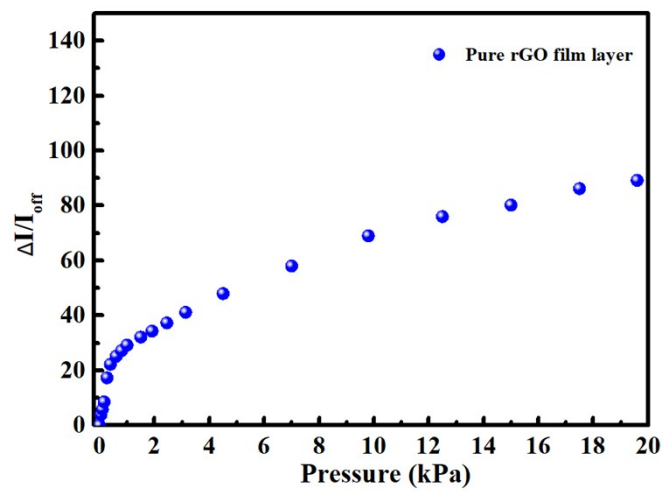


Figure S6 Current response ($\Delta I/I_0$) vs. applied pressure of the pressure sensor based on the pure rGo film layer.

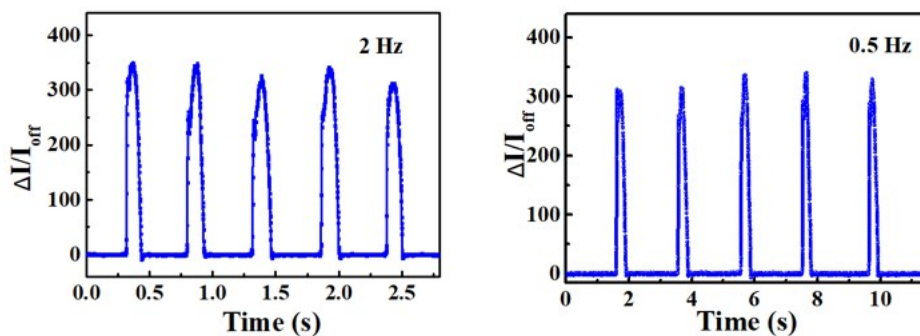


Figure S7 The response at the frequency of 2 Hz and 0.5 Hz under recurrent 8 kPa pressure.

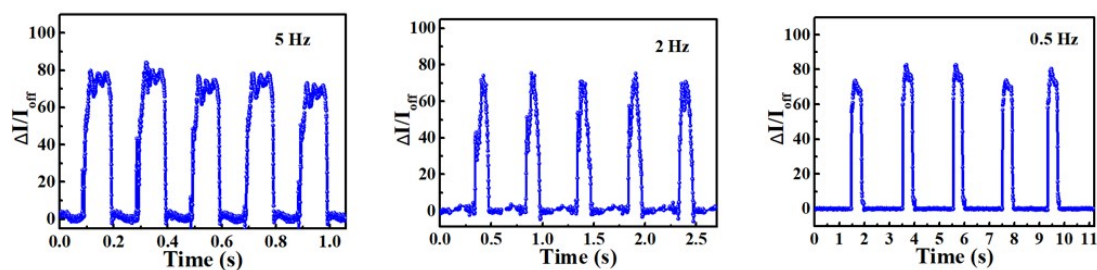


Figure S8 The responses under recurrent 1 kPa pressure at frequencies of 5, 2 and 0.5 Hz

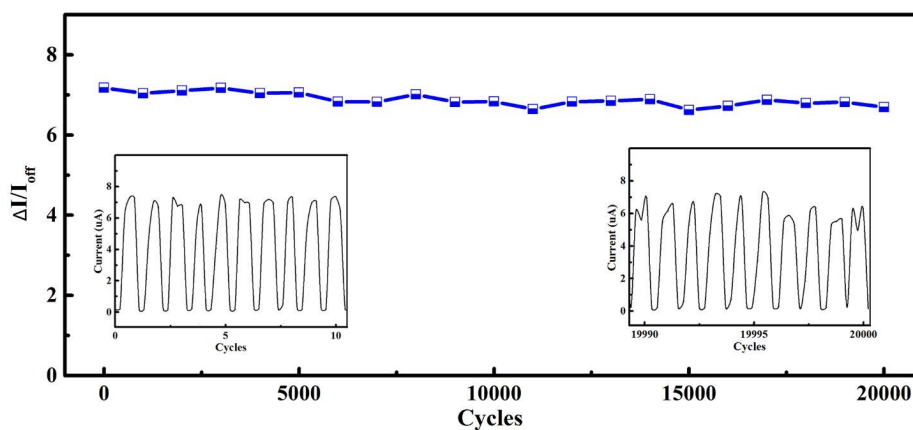


Figure S9 Retentions Current response ($\Delta I/I_0$) in 20,000 cycles of the PS ball@rGO-based pressure sensor.

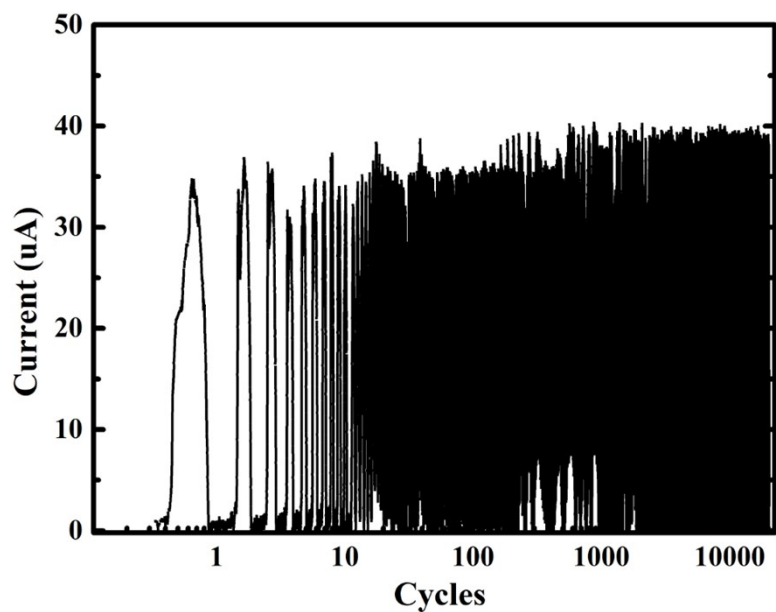


Figure S10 Current response changes ($\Delta I/I_{off}$) recorded under 20,000 cycles of an applied pressure of 8 kPa.

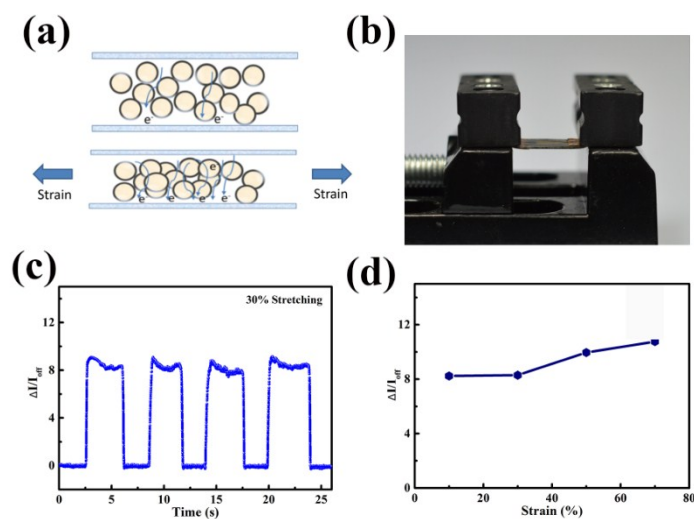


Figure S11 The stretching performance of the sensor. (a) The schematic diagram of how this resistive pressure sensor response to a horizontal stretch under a bias voltage. (b) The device stretched on the one-dimensional sliding platform. (c) Current response ($\Delta I/I_{off}$) upon 30% stretching. (d) Current response ($\Delta I/I_{off}$) changes from 10 % to 70 % stretching.

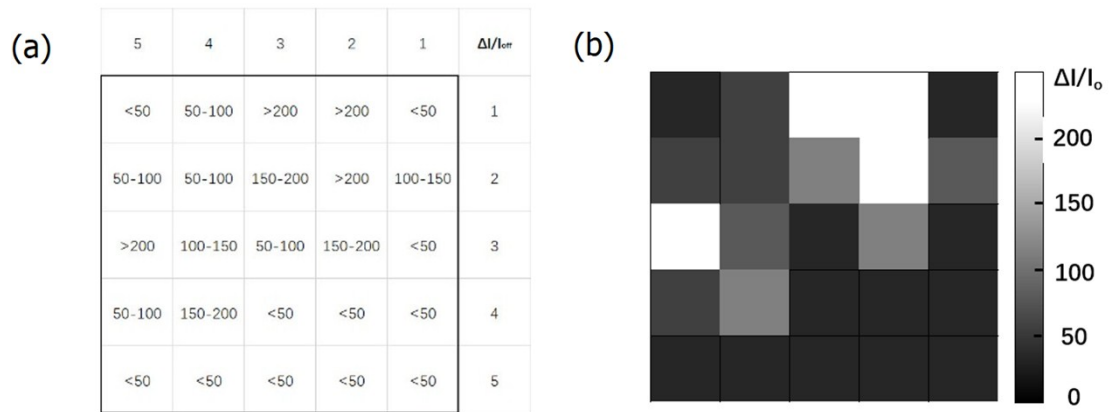


Figure S12 (a) The response current range value of each point of the 5×5 pressure-sensors array. The $\Delta I/I_{off}$ value of each pressure sensor was classified to 5 levels from 0 to 200. (b) Current mapping of pressure distributions according to the value in (a).