

## Supplementary information

# Solvent-free fabrication of Multi-walled carbon nanotube based flexible pressure sensor for ultra-sensitive touch pad and electronic skin applications

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### **1. Materials**

Polyimide tape was procured from Electrical-insulations, Mumbai, India, cellulose filter paper (EW-81051-92, 120  $\mu$ M thickness and 7cm diameter was acquired from Advantec, USA. The MWCNT powder with 95% purity and 10-20nm diameter (RN-HI—95MWCNT0.5-200) was acquired from Reinste Nano ventures, India. Copper tapes were used for making connections to the external electronic circuitry with the Arduino board.

### **2. Device characterization**

Field emission scanning electron microscopy (Zeiss Ultra -55 scanning electron microscope) was used to study the morphology of pre-compaction mechanical pressed MWCNT on PI

and on cellulose paper. Pressure sensing measurements were carried out using Keithley 4200 SCS.

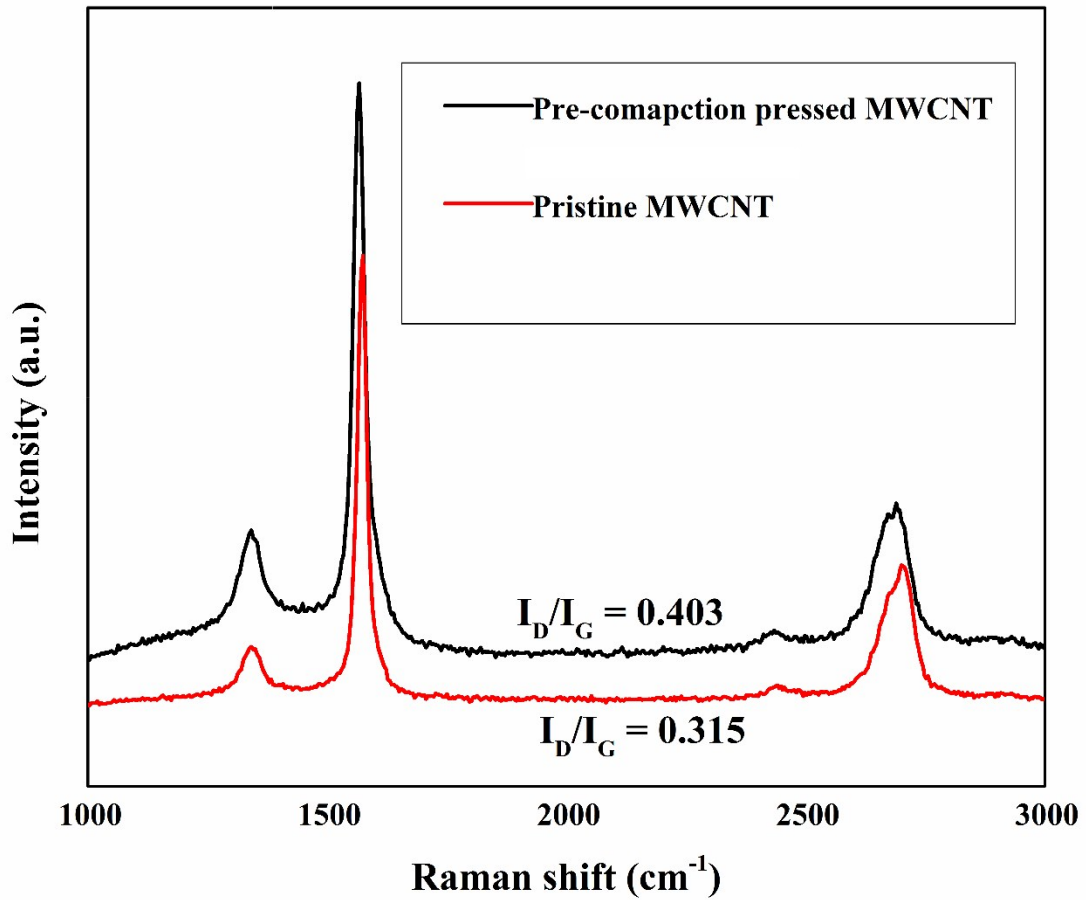


Fig S1: Raman spectra of MWCNT for pristine and pre-compaction pressed MWCNT which indicates that pre-compaction mechanical press induces defects thereby increasing the ID/IG ratio.

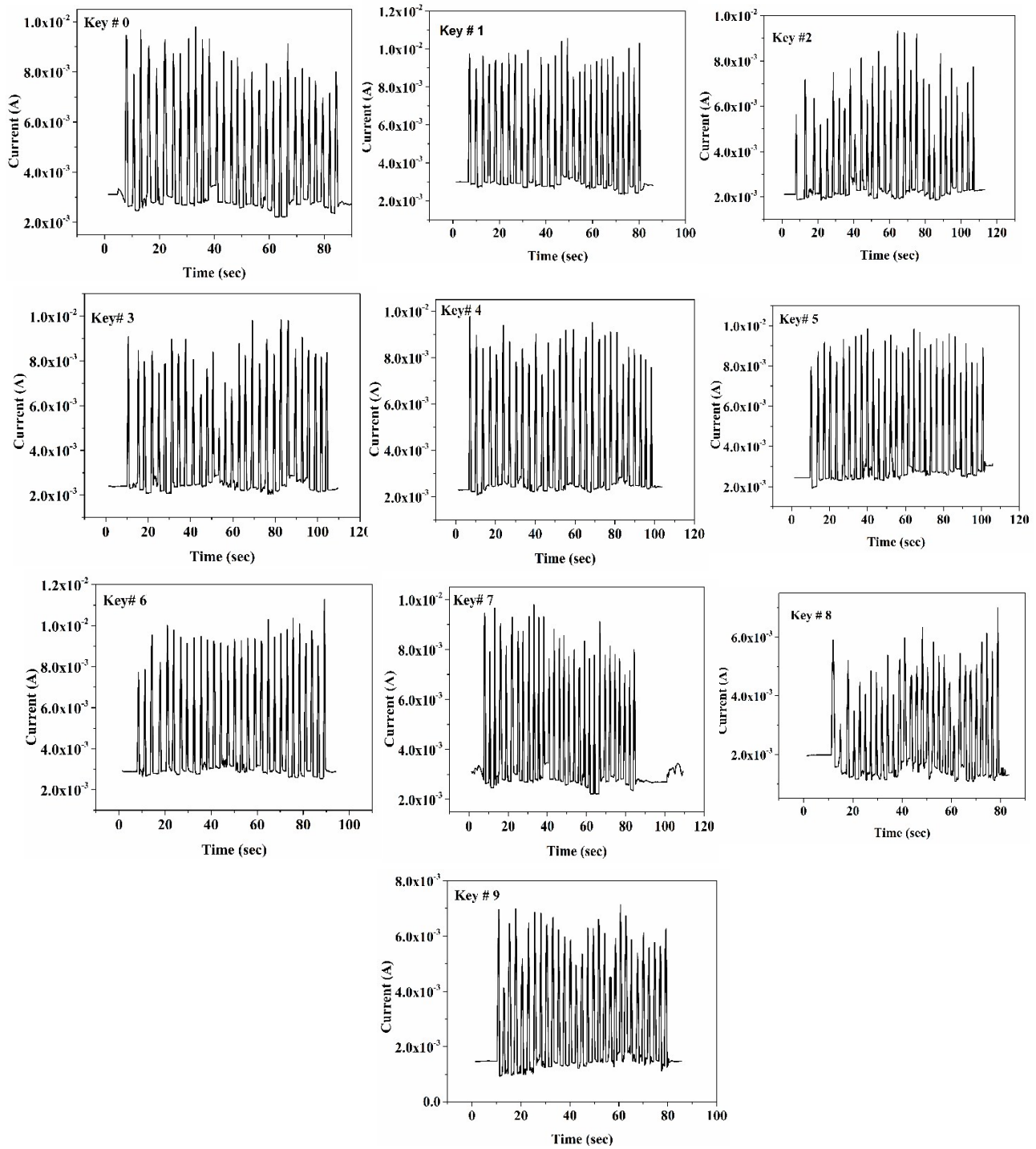


Figure S2. Temporal response of the fabricated sensor to human hand press for 30 times for all 10 keys of flexible touch pad.

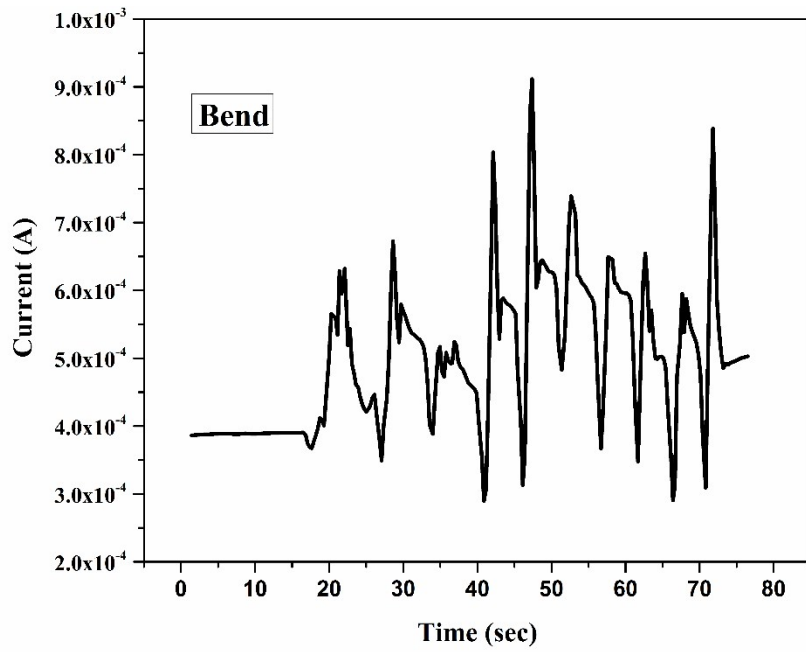


Figure S3. Response of the sensor under dynamic bending.

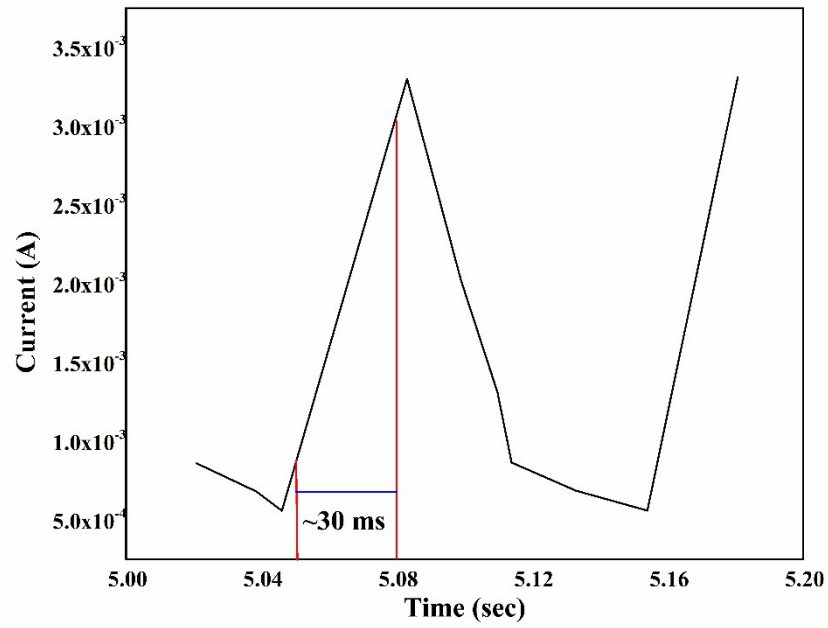


Fig S4: Graph demonstrating the calculation of response time. The response time is calculated by difference in the time taken by the sensor to reach from 10% to 90% of the maximum value of current.

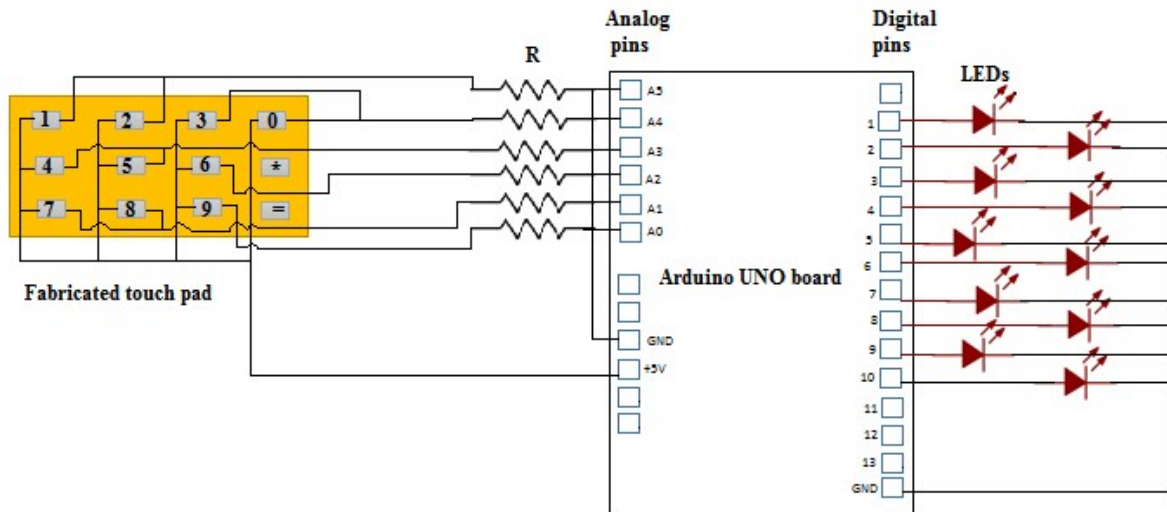


Figure S5. Layout of the interface of fabricated touch pad with Arduino board

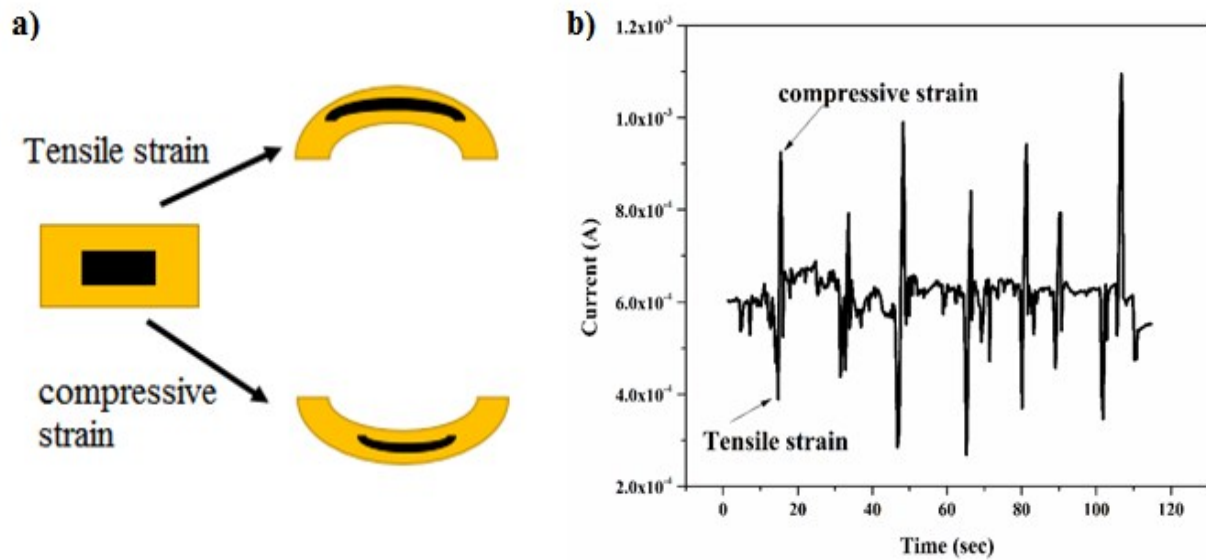


Figure S6. a) Schematic showing tensile and compressive strain b) temporal response under tensile and compressive strain of the fabricated sensor

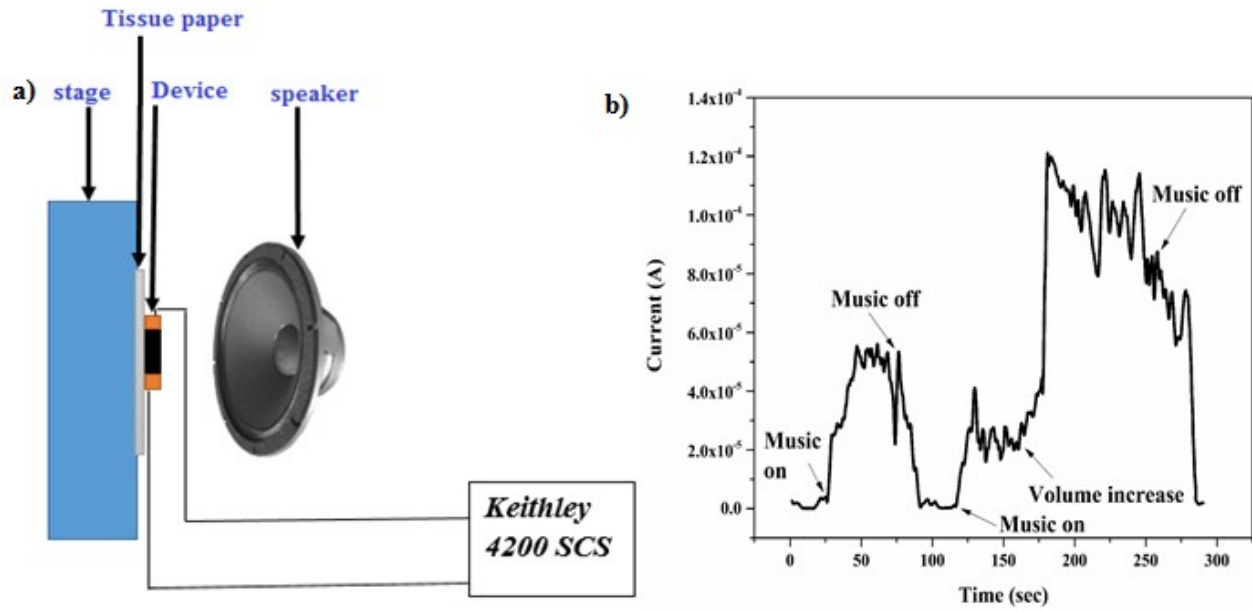


Figure S7. a) Schematic of the experimental set up for acoustic vibration detection b) response of the sensor to acoustic vibrations from speaker on playing a song