

# Ultrathin free-standing graphene oxide film based flexible touchless sensor\*

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## Support Information

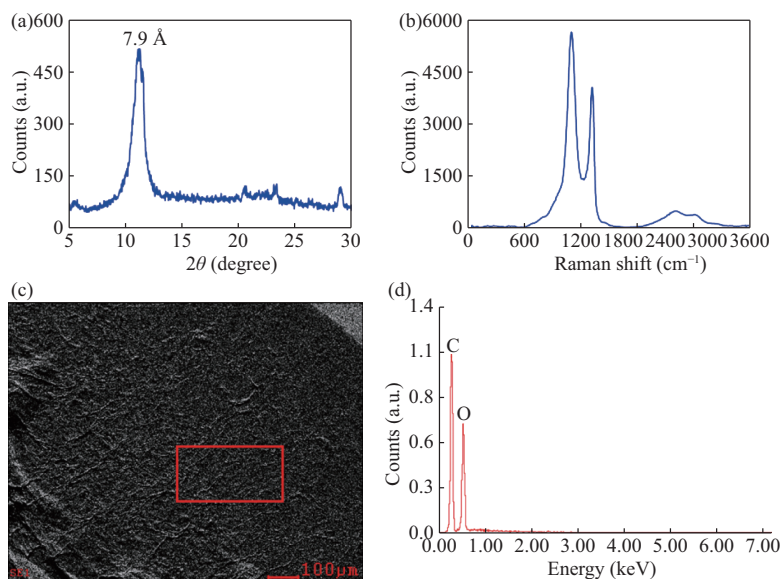


Fig. S1. (Color online) The (a) XRD pattern, (b) Raman spectra, (c) SEM images, and (d) EDS spectra of GO.

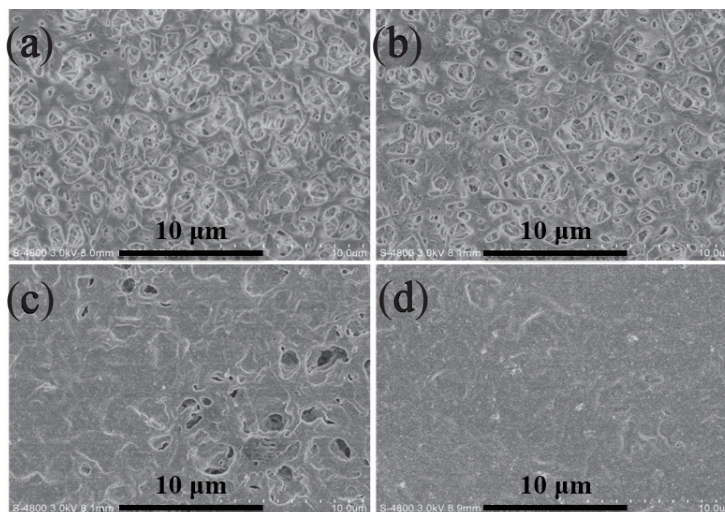


Fig. S2. The SEM images of PTFE/Ni(OH)<sub>2</sub> membrane by filtering different volume Ni(OH)<sub>2</sub> nanosheets suspension (0.01 mg/mL): (a) 3 mL, (b) 5 mL, (c) 8 mL, and (d) 10 mL.

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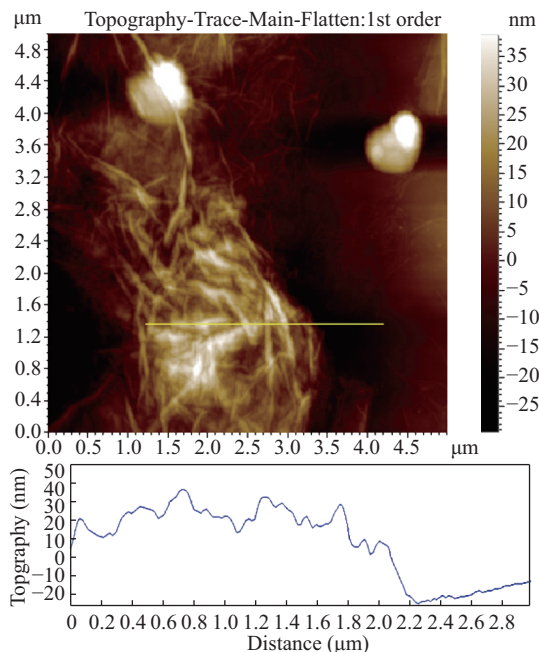


Fig. S3. (Color online) The AFM images and height profile of prepared GO films by filtering 5 mL (20 mg/mL) GO dispersion.

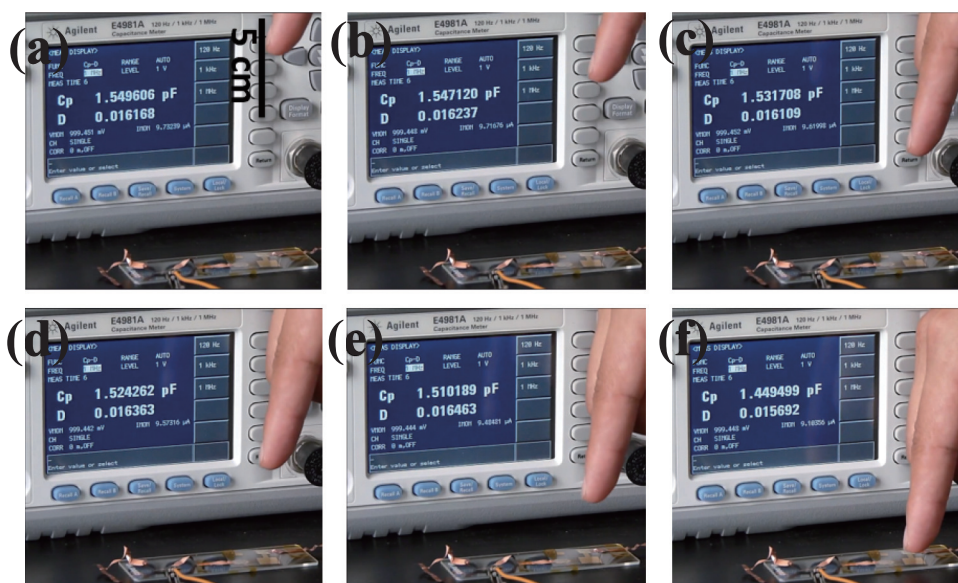


Fig. S4. (Color online) A series of picture when hand approaching the sensor.

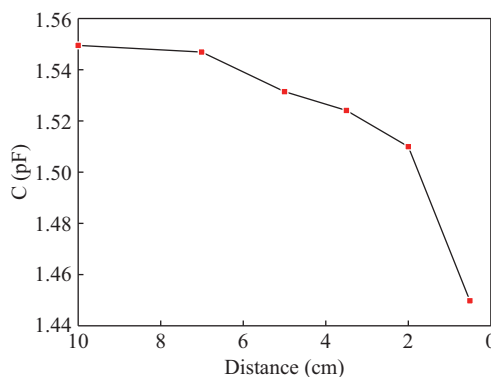


Fig. S5. (Color online) The changing of the capacitance when hand approaching the sensor.

A new sensor was prepared and obtained a series pictures. As shown in Fig. S4, from Fig. S4(a) to Fig. S4(c), the distance between hand and sensor changing from 10 to 5 cm ( $\Delta C = 0.017$  pF), and the distance between hand and sensor changing from 5 to 0.5 cm as shown in Figs. 1(c) and 1(f) ( $\Delta C = 0.083$  pF). Fig. S5 shows the changing value of the sensor becoming more obvious when the distance between hand and sensor are more and more smaller and the distance (Fig. S5) and this phenomenon can also be recognized in the

Ref. [1, 2].

## References

- [1] Aezinia F, Wang Y F, Bahreyni B, et al. three dimensional touchless tracking of objects using integrated capacitive sensors. *IEEE Trans Consum Electr*, 2012, 58(3): 886
- [2] Haslinger L, Hehenberger S, Zagar B G. Capacitance measurement system for touchless interaction. *Proc Eng*, 2016, 168: 737