Supporting Information

Object recognition by a heat-resistant core-sheath triboelectric nanogenerator sensor

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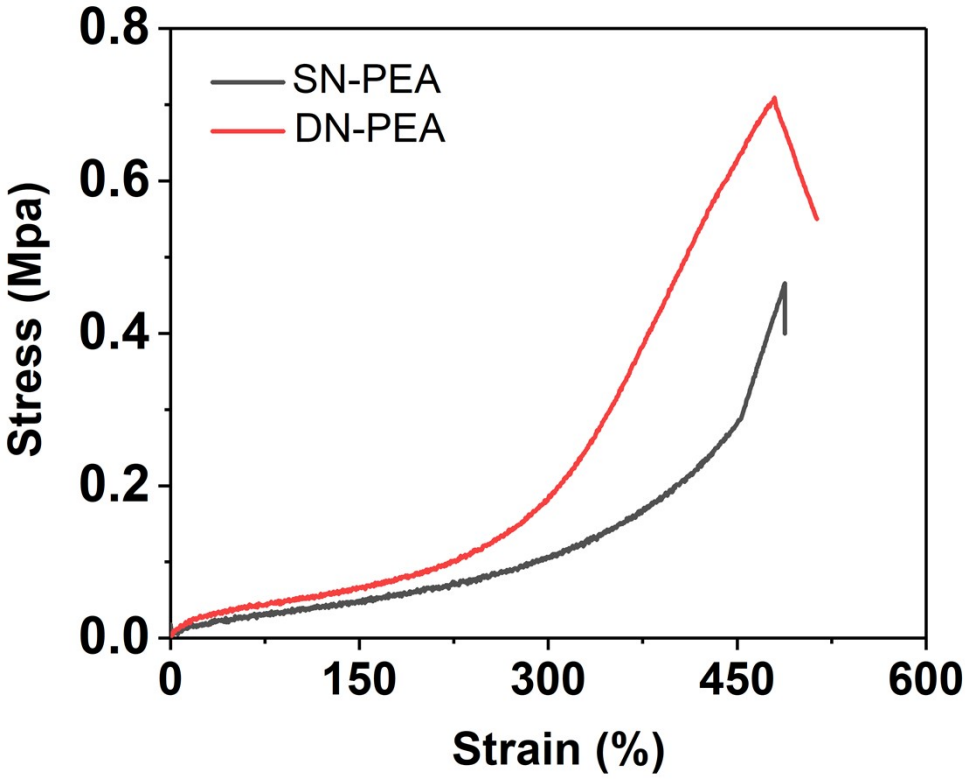
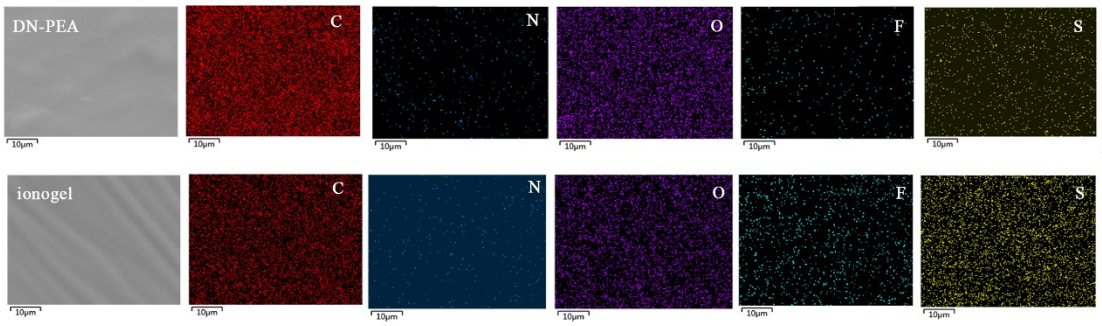
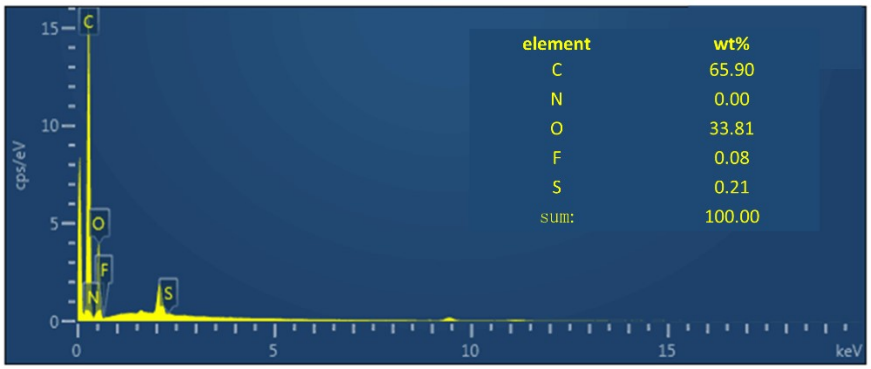


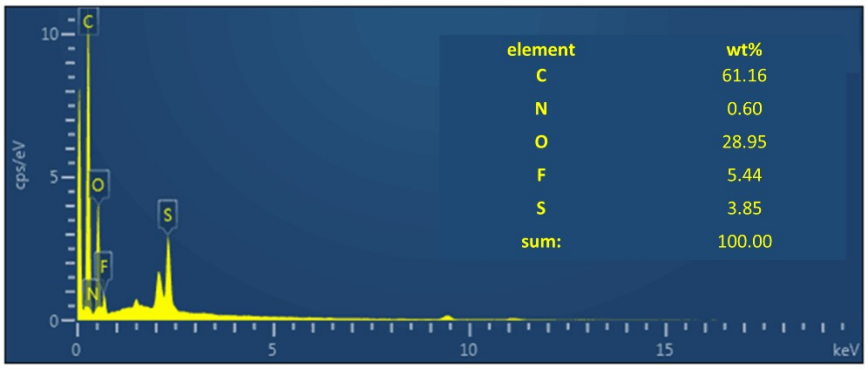
Fig. S1 Stress-strain curve of the single network elastomer (SN-PEA) and the double network elastomer (DN-PEA). The DN-PEA has higher tensile strength.



(i)



(ii)



(iii)

Fig. S2 (i) EDS images of DN-PEA and the ionogel, (ii) Element content diagram of DN-PEA, (iii) Element content diagram of ionogel.

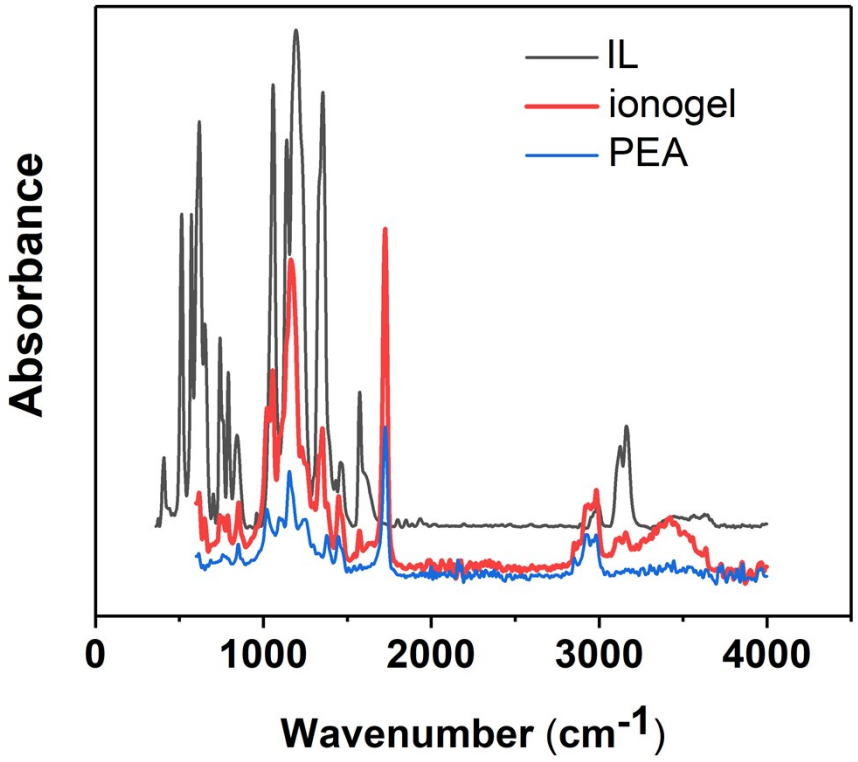


Fig. S3 ATR-FTIR spectra of ionic liquid (IL), ionogel and DN-PEA.

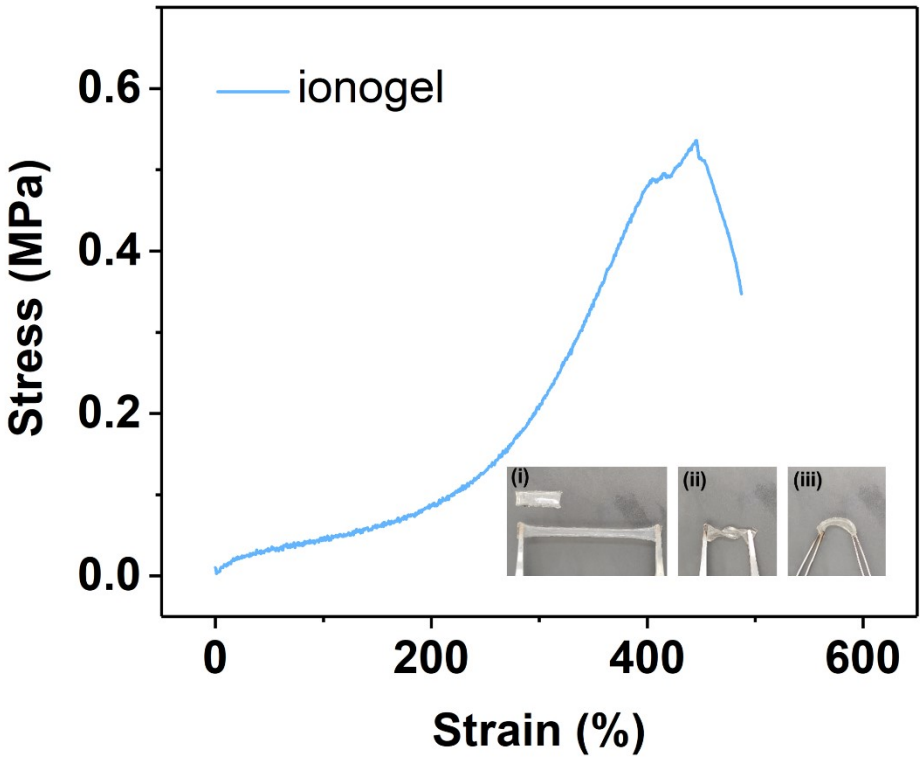


Fig. S4 Stress-strain curve of the ionogel. Inset: the ionogel has good mechanical properties and can be stretched (i), twisted (ii) and bended (iii).

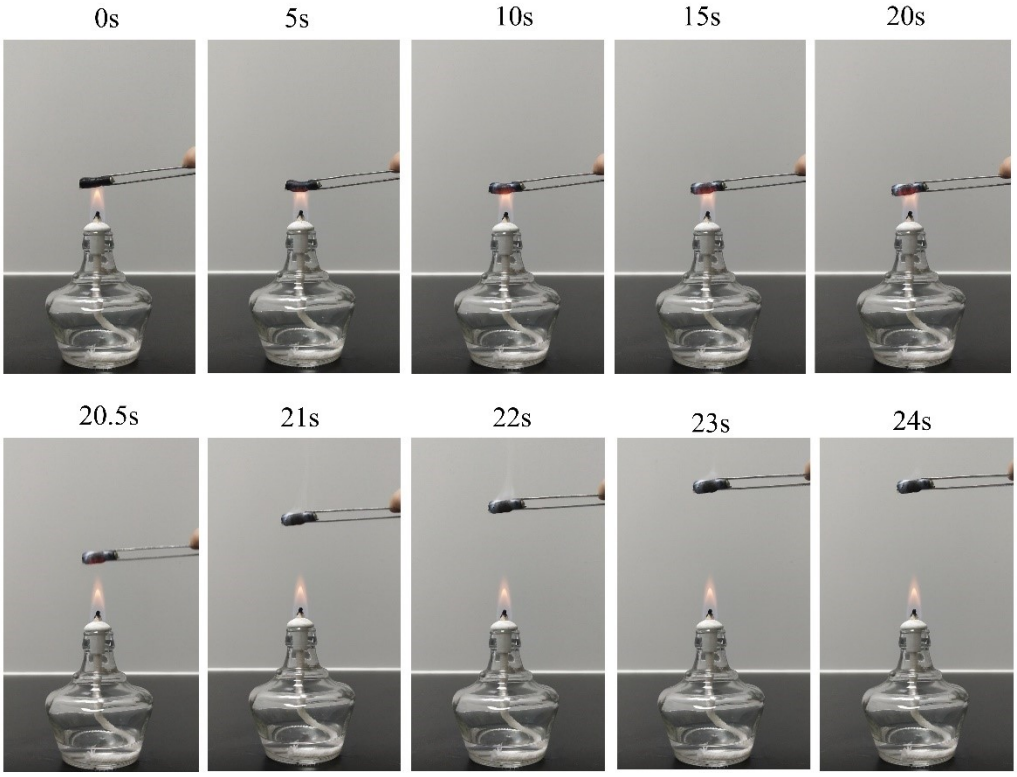


Fig. S5 Pictures of I-TENG sensor burned on an alcohol lamp for 20s and then self-extinguishing after being removed.

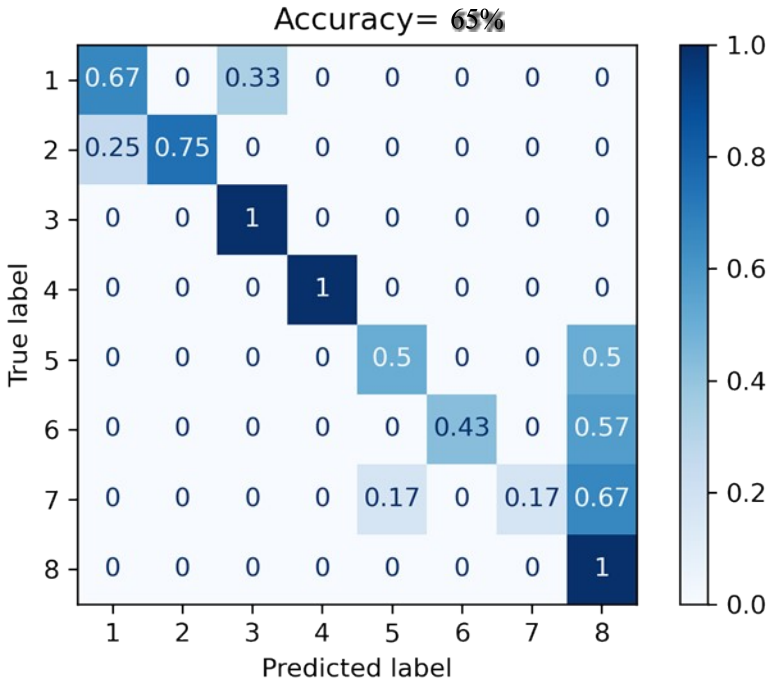


Fig. S6 Confusion map for machine learning outcome with total data of weights.

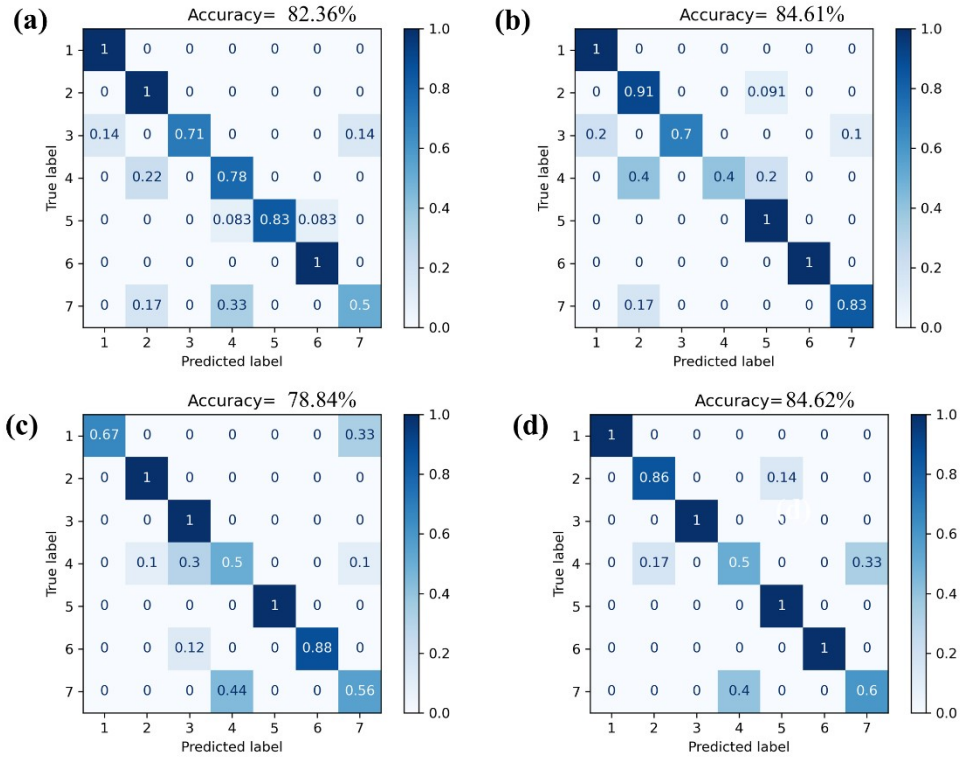


Fig. S7 Confusion diagram of machine learning results for different object shapes: (a) total data, (b) maximum and mean data, (c) maximum and standard data, and (d) mean and standard data.

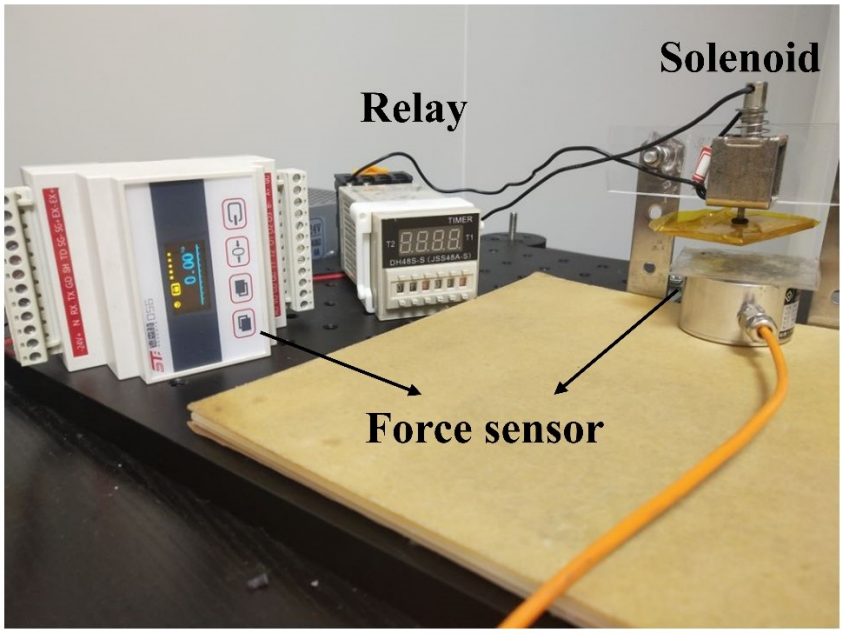


Fig. S8 The assembled setup to generate the necessary contact-separate process.

Movie S1: Preparation of a 3D-printed patterned silicone sheath.

Movie S2: Conductivity test of the ionogel at different temperatures.

Movie S3: Electric output of I-TENG induced by tapping one finger on hand back with different intensities and speeds.

Movie S4: The catching process of a sand-loaded cup (806g).