A Machine-Learning-Algorithm-Assisted Intelligent System for Real-Time Wireless Respiratory Monitoring

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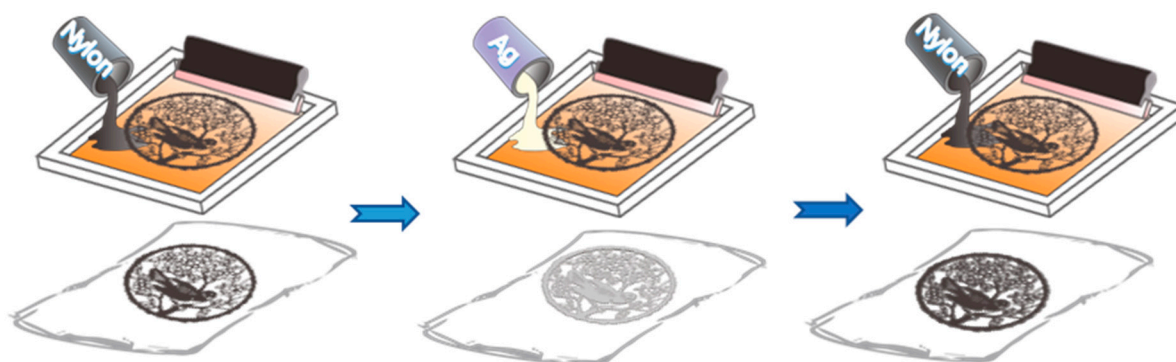
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Figure S1. The flow chart of a self-powered triboelectric respiratory sensor fabricated by screen printing.
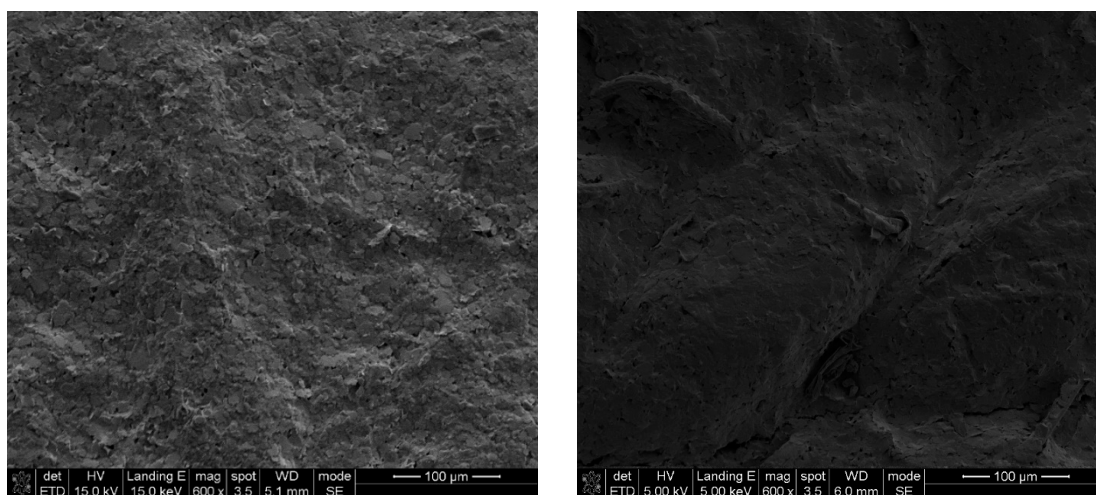

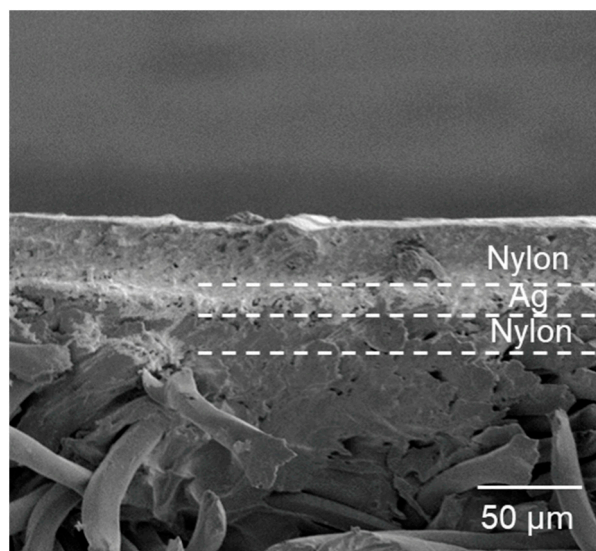**Figure S2.** SEM images of screen-printed (a) Ag layer and (b) nylon layer on textile.

Figure S3. The cross-sectional SEM images of screen-printed triboelectric respiratory sensor.

Figure S4. The weight of the textile printing with the triboelectric respiratory sensor and the pure textile with the same size.

Table S1. Cost of each layer of 4×4 cm² respiratory sensor.

| Material	Unit price ($)	Consumption	Cost ($)	Source of purchase
Commercial mask	0.35/piece	1 piece	0.35	www.taobao.com
Nylon ink	0.011/ml	0.064 ml	0.00071	Hangzhou MIHE Trading Co. Ltd
Ag ink	1.09/ml	0.0192 ml	0.021	Qingdao Nano Print Materials Technology
PTFE film	2.975/m²	16 cm²	0.0048	Dongguan Hongfu Insulating Material Co., Ltd
Ag adhesive tape	0.0308/m	2 cm	0.00062	www.taobao.com
Total			0.377	
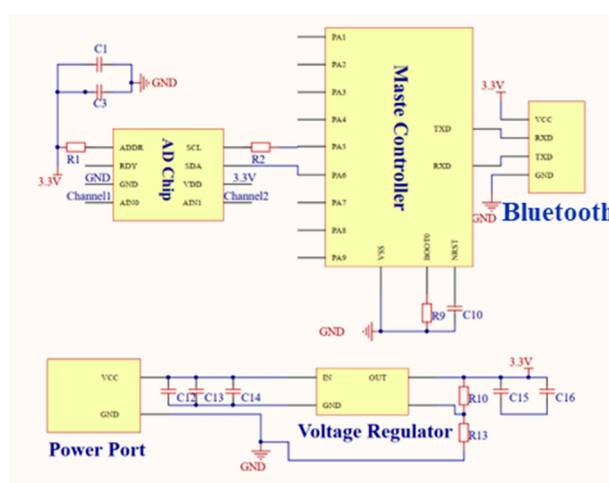
Figure S5. The circuit diagram of the self-built portable data acquisition circuit board.
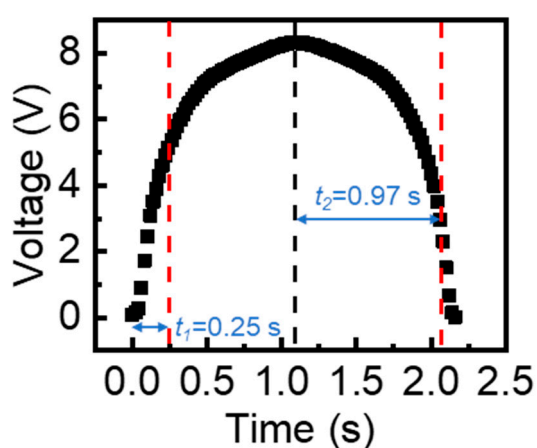

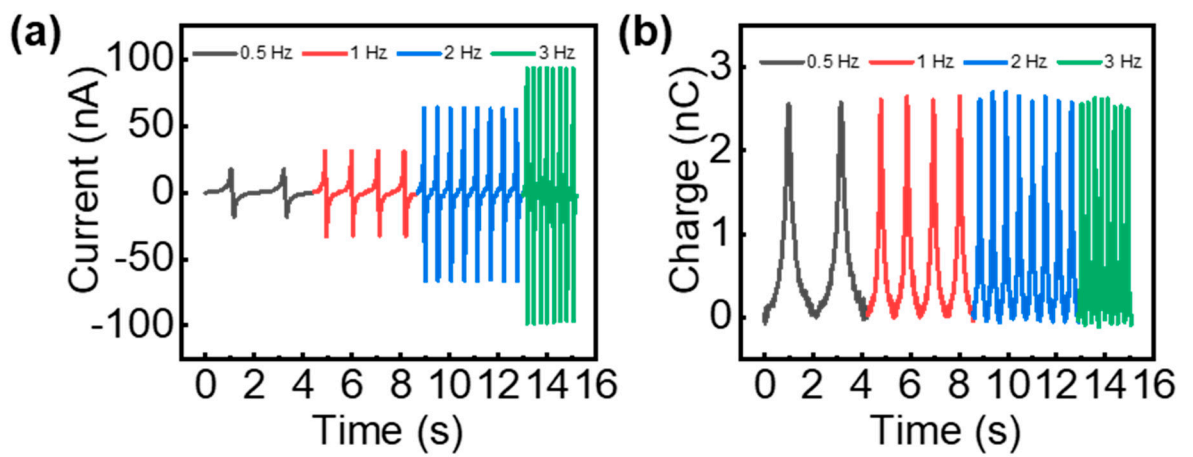**Figure S6.** The response and recovery time of the respiratory sensor under 0.5 Hz.

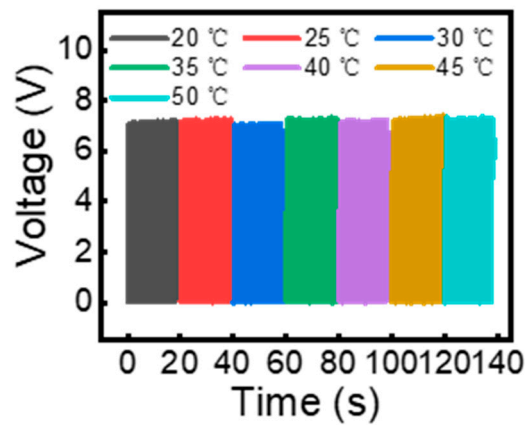**Figure S7.** Output (a) current and (b) charge curves at different operating frequencies from 0.5 to 3 Hz.

Figure S8. The effect of 20-50 ℃ temperature on the electrical output characteristics of respiratory sensor.
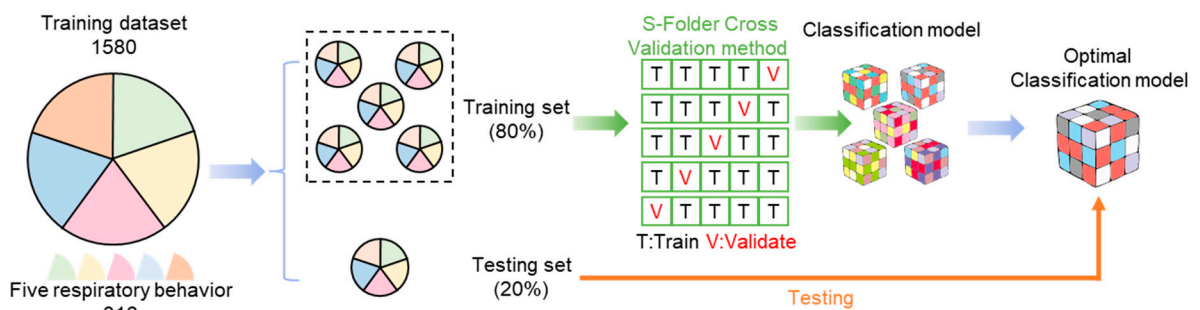

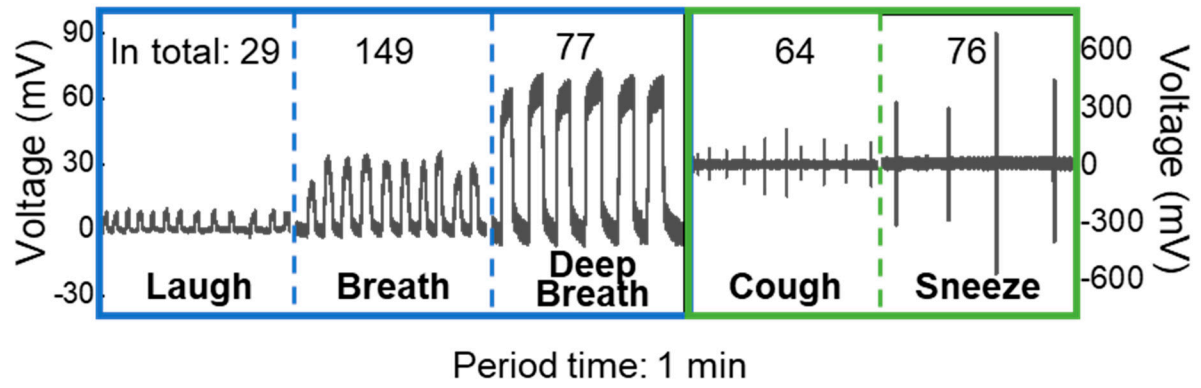**Figure S9.** The training process of the decision tree algorithm.

Figure S10. the randomly selected 1min signal periods of five respiratory signal curves are used for the recognition accuracy test of the decision tree algorithm. The total number of the test data set is 29 laughing samples, 149 normal breathing samples, 77 deep breathing samples, 64 coughing samples, and 76 sneezing samples.