



**Fig. S5 Real operation window of vigilance scoring.** **a** paradigm of EEG/EMG/Activity raw data in a 80-s recording period. **b-d** Typical examples of SWS (labeled as NR), REM sleep (labeled as R) and wakefulness (labeled as W) in a 4-s epoch counting unit, respectively. **e-g** Typical examples of FFT of SWS (matching with **b**), REM sleep (matching with **c**) and wakefulness (matching with **d**) in a 4-s epoch counting unit, respectively.