Highly stretchable and sensitive strain sensor for lip-reading extraction and speech recognition

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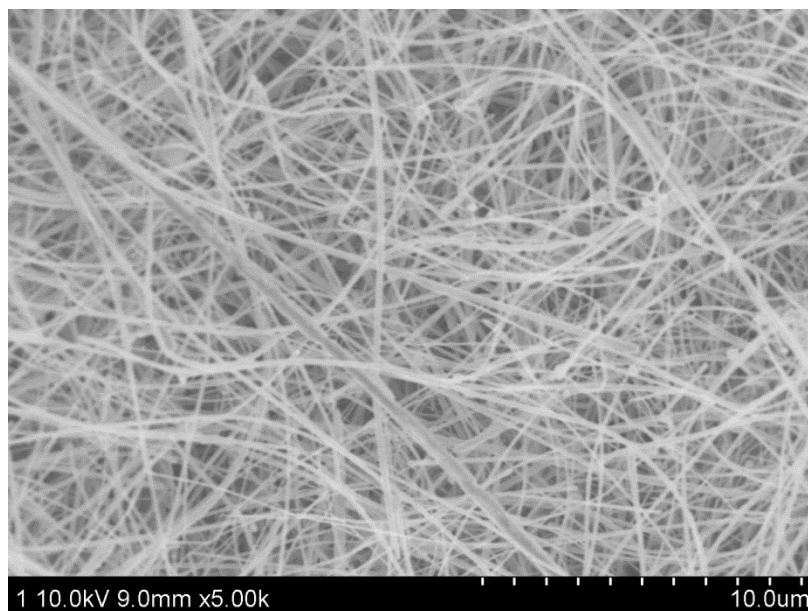*Aiping Liu. E-mail: liuaiping1979@gmail.com

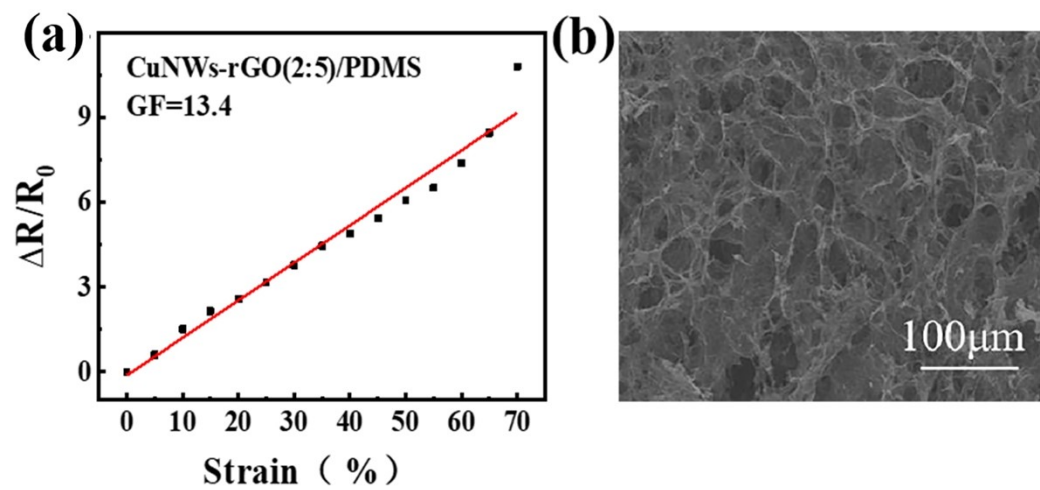**Figure S1.** Top view SEM image of pure Cu NWs with 50-60 μm in length and 200-300 nm in diameter.

Figure S2. The Sensitivity of CuNWs-rGO/PDMS sensor for CuNWs to GO mass ratio of 2:5 (a) and the corresponding SEM (b).
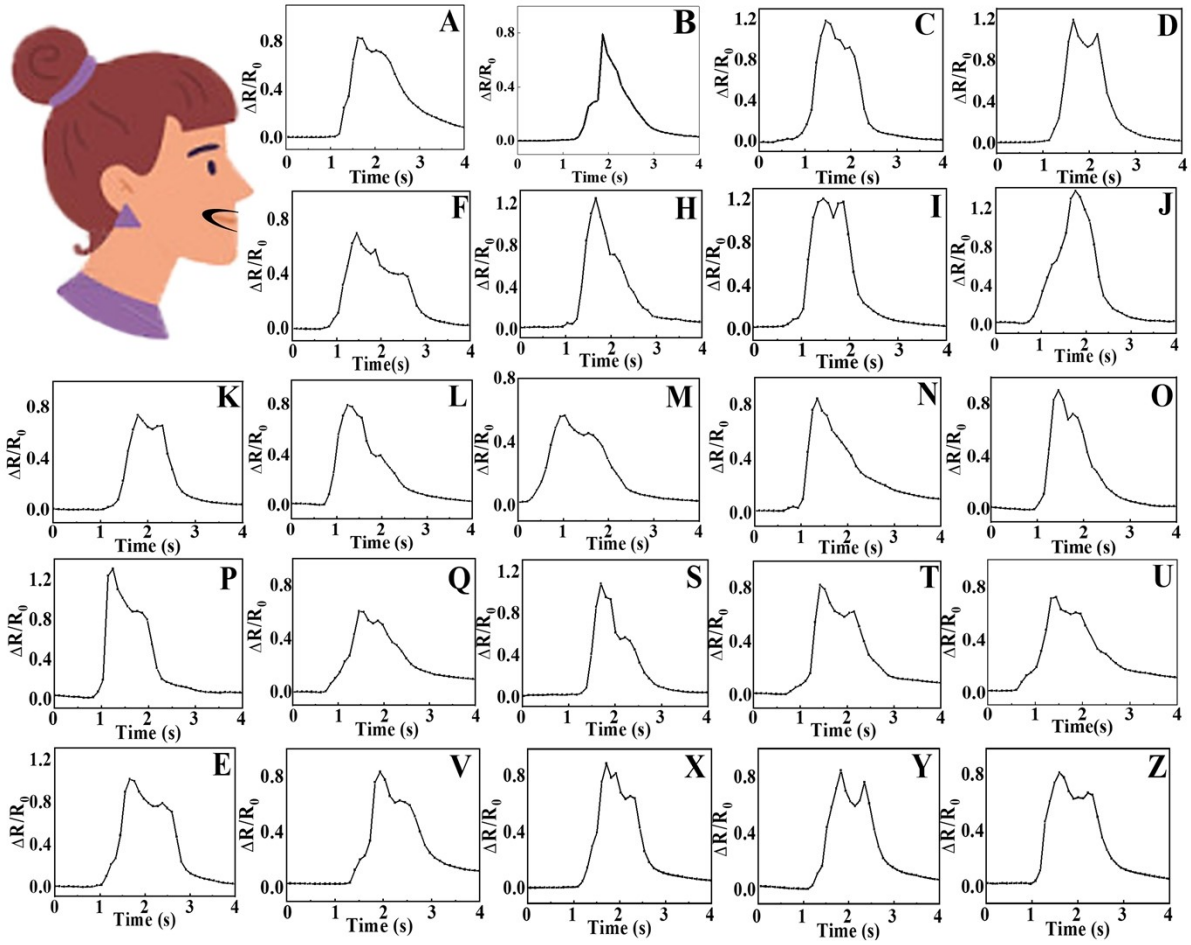
Figure S3. The relative resistance changes when speaking 26 English letters, of which "R", "G", "W" have already appeared in the body text.
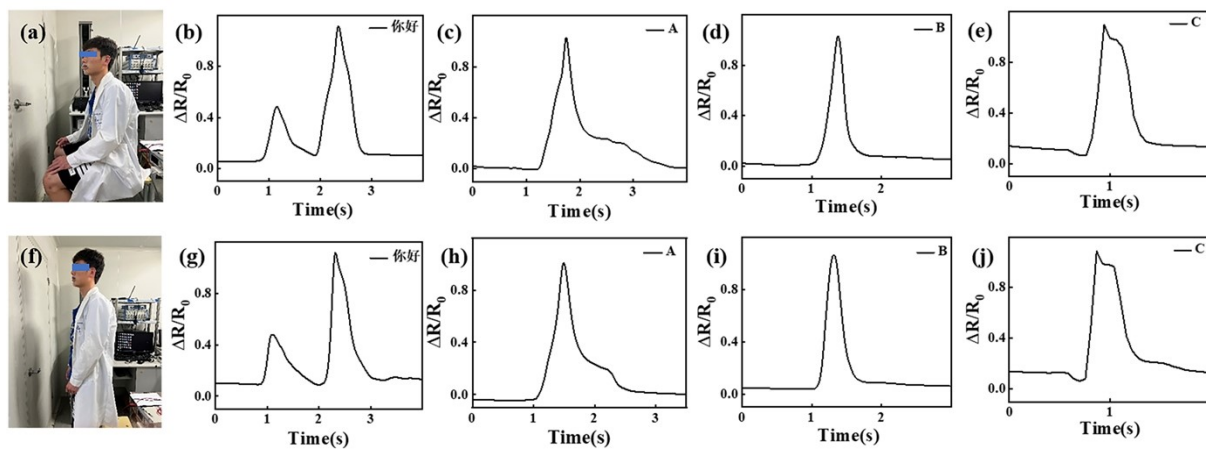
Figure S4. Optical images of lip reading signal testing in a stationary position (a) and during walking dynamics (f) with the sensor placed in a natural environment for two months, the corresponding relative resistance changes of the sensor when the volunteer reads "A"、"B"、"C" and "你好" in a stationary position (b-e) and during walking dynamics (g-j).
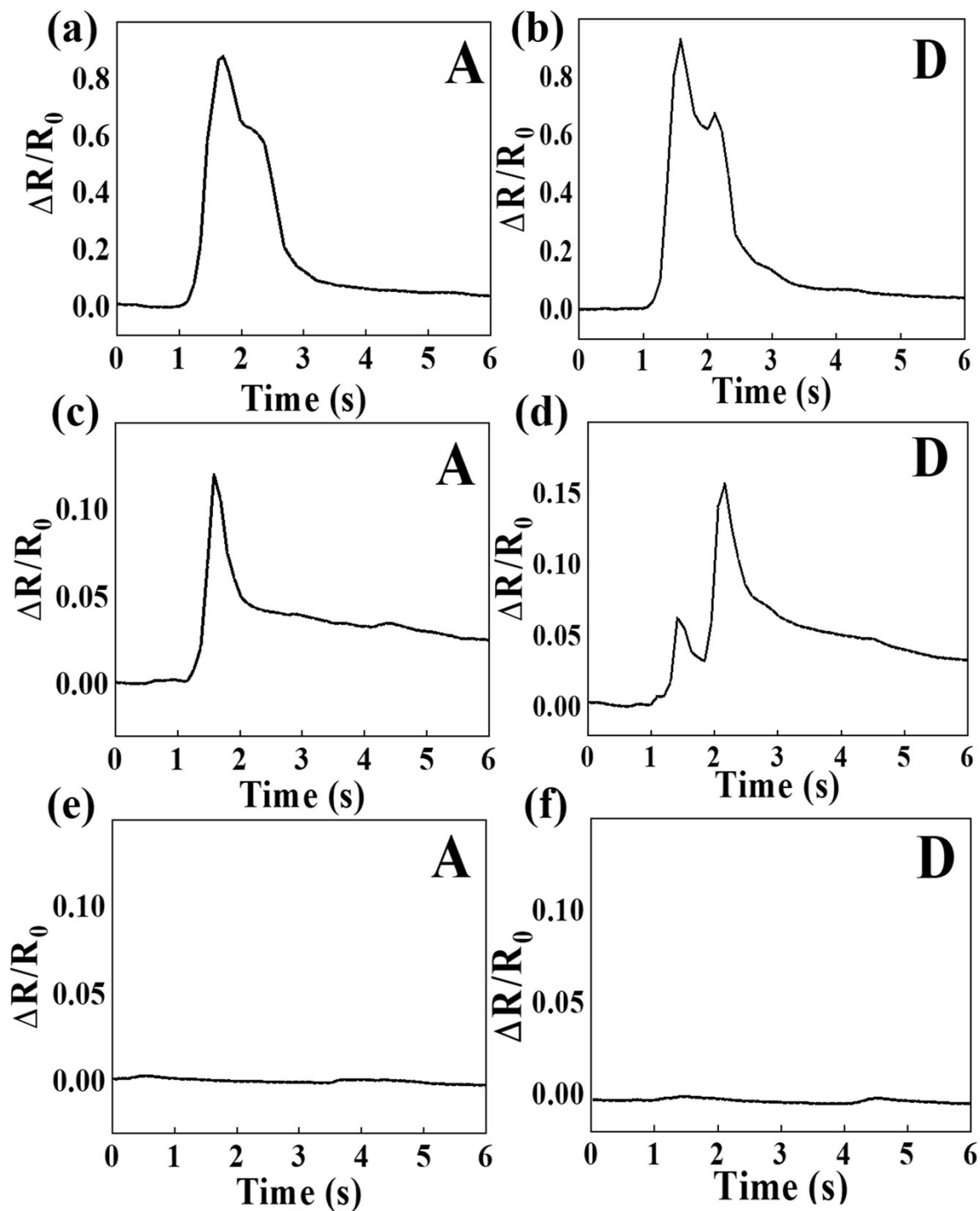
Figure S5. (a) and (b) The relative resistance changes around lips when speaking "A" and "D" without making noise. (c) and (d) The relative resistance changes at soundtrack when speaking "A" and "D". (e) and (f) The relative resistance changes at soundtrack when speaking "A" and "D" without making noise.

Movie S1. Application of lip-reading recognition system in voice broadcast and text display.

Movie S2. Barrier-free communication of volunteers with damaged vocal cords with normal people through a lip-reading recognition system.