

Chinese scientists plan wearable device that can listen, speak

Chinese scientists are researching the new material graphene to produce a smart wearable device to enable those with hearing and speaking disability to listen and speak normally.

Ren Tianling, a professor at the Institute of Microelectronics of Tsinghua University, is leading the team on the device, taking full advantage of graphene's special characteristics, such as excellent electric and thermal conductivity.

Graphene is a thin layer of pure carbon, a two-dimensional form of carbon in sheets just one atom thick, tougher than a diamond, yet lightweight and flexible, and it is a material with extremely strong electric and heat-conducting properties.

Ren's team has published a research paper on producing the wearable device made of graphene, in Nature Communications, an international science journal, the Xinhua News Agency reported.

The porous graphene material would make the device detect weak vibrations while it could produce sounds in a wide spectrum from 100Hz to 40kHz under the thermoacoustic effect.

Researchers would first record and encode the disabled people's sounds, such as coughs, whispers and screams, in different intensity and frequency into groups and then match each group with sounds of words, phrases or sentences.

When the device detects the sounds in groups, it will "speak" the words, phrases or sentences.

Tao Luqi, a doctoral student who took part in the research work, said the deaf-mute people need to compose the codes of their sounds in groups and remember them. It is something similar to typing the keys on a keyboard, and the device would respond to the codes by speaking the words back.

The device would also create the sentences in different tones as it would be capable of capturing even small differences such as high or low pitch.