3D image of the skin can be produced in ten minutes

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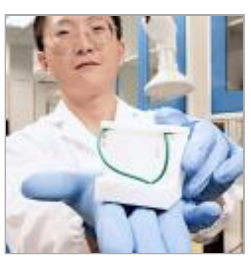
3D printing
Research & Development



Researchers at Nanyang Technological University (NTU) have developed an electrochemical device that creates high-resolution 3D images of the skin in ten minutes. It uses a special gold-coated foil for this purpose. The 3D maps promise the possibility of assessing skin diseases better than normal 2D images. The compact device could also improve care in remote areas, since its use does not require expert knowledge and the images make remote diagnosis easier for doctors.

The 3D-printed prototype of the battery-operated device is seven by ten centimeters in size and weighs just 100 grams. "It is an example of a simple but very effective application of electrochemistry, since no expensive electronic hardware is required," says Fu Xiaoxu, PhD student in the field of civil and environmental technology. Because in principle the device serves to develop the gold-coated foil like a film after it has been pressed onto an area of the skin to be examined.

When the film is pressed on, sebum provides an impression of an area of skin up to five by five centimeters. There is a solution in the device which, when voltage is applied, simply deposits the Pedot: PSS polymer on the film where there is no sebum. Ultimately, this provides a 3D map of the skin area, which depicts skin imperfections up to two millimeters deep. This map can then help, for example, to assess the severity of eczema or psoriasis. According to NTU, it is also conceivable to use it to observe the progress of wound healing.

The device could complement the diagnostic procedures that have been used up to now or possibly serve as a cheap alternative. After all, the compact device is not only cheaper, but also much more portable than currently available diagnostic aids. "In rural regions that do not have easy access to health care, non-medically trained personnel could use them to create skin maps," explains Grzegorz Lisak, NTU professor in the field of civil and environmental engineering. These could then be transmitted to medical professionals who use the 3D images to make a diagnosis. The team hopes to start clinical trials this year.