

Imperceptible active matrix sensors for bio-medical applications

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I will present the recent progresses and future prospects of large-area, ultraflexible, and stretchable electronic sensors. Our works focus on integration technologies of organic electronics comprising organic thin-film transistors (TFTs), manufactured on thin-film flexible polymeric plastic substrates and stretchable rubber substrates, which are imperceptible active matrix sensors.

Here I would like to demonstrate the applications of imperceptible sensors for sophisticated wearable electronics and implantable electronics. These sensors serve as an important part of next generation bio-medical applications.

On the basis of our initial work on manufacturing flexible organic devices, including TFTs, LEDs, and PDs, we developed organic flexible electronics for applications that use large-area sensors, actuators, memories, and displays [1-13].

For example, by taking advantage of an ultraflexible and compliant amplifier that can amplify biological signals by 500, we developed 1- μm -thick multi-channel active matrix electrocardiogram and electromyogram monitoring systems. Ultrathin electronics with a total thickness of approximately 1 to 2 μm support a bending radius of less than 10 μm .

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