11th Korea-U.S. Forum on Nanotechnology

Stretchable UV sensor arrays of SnO_2 Nanowires

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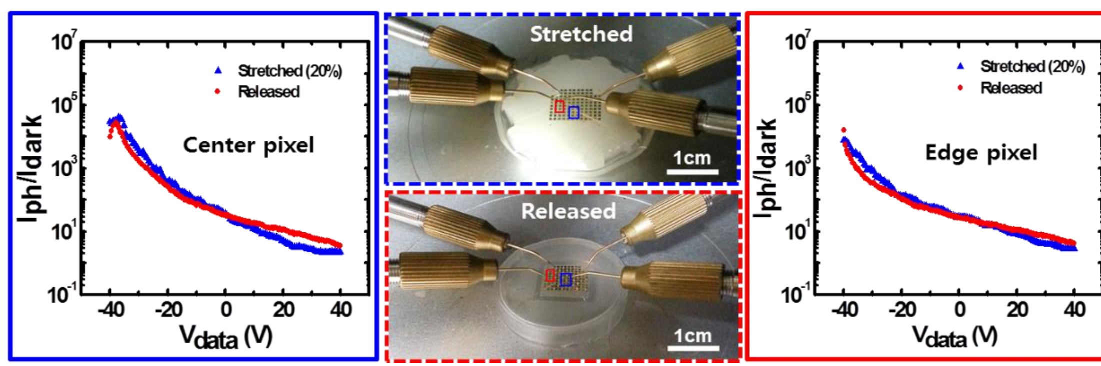
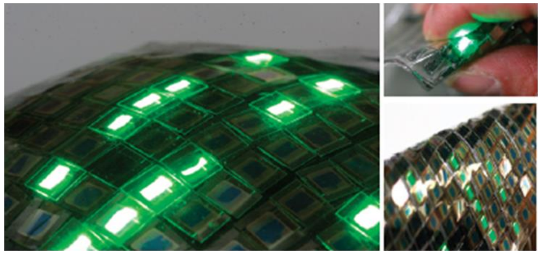
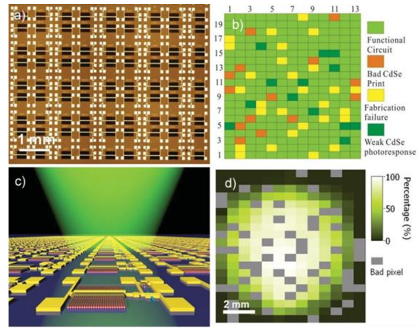


Stretchable electronics and Nanowire sensor array

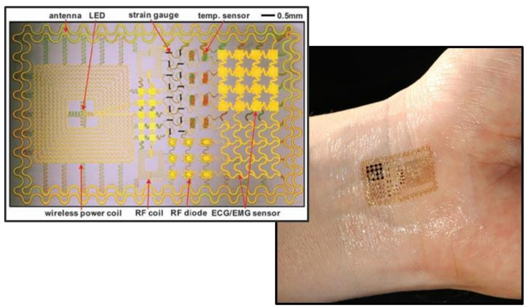


T. Sekitani *et.al, Nature Mater.* ***8***, 494-499 (2009)

Stretchable AMOLED display

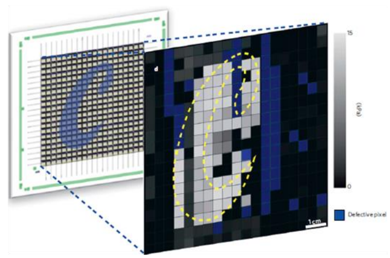


Z. Fan *et.al*, PNAS.***105***, 11066-11070 (2008)



D.H. Kim *et.al, Science.* ***333***, 838-843 (2011)

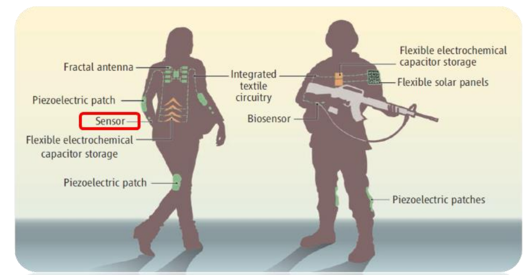
Stretchable Multifunctional electronics



K. Takei *et.al, Nature Mater.* ***9***, 821-826 (2010)

Stretchable Sensor

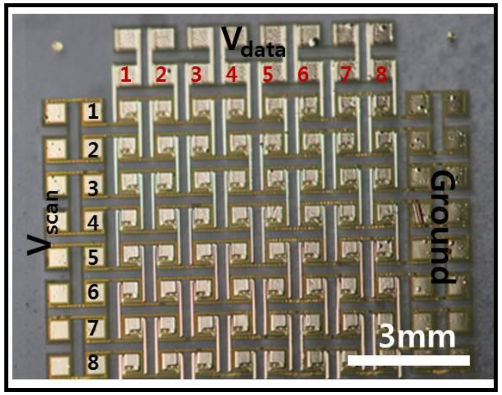
Apply to Wearable/implantable computer and power dressing sensor

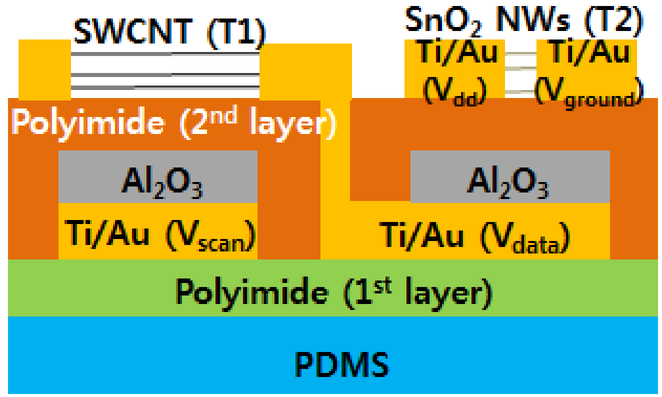


Power dressing concept, *Science*, **335,** 1312 (2012)

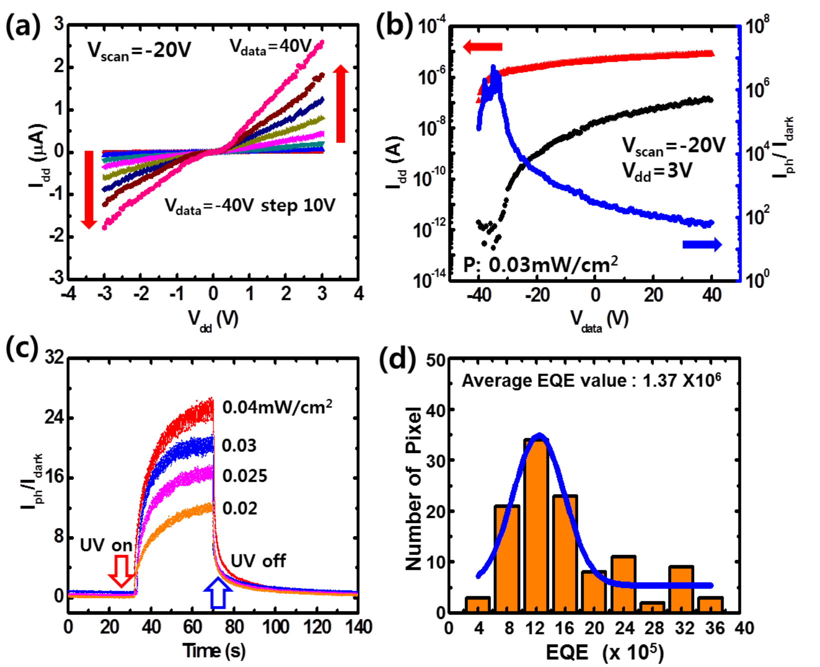
Recently, there has been extensive research on stretchable electronics implantable to human body such as skin and organs. In particular, **high performance stretchable devices including UV, gas, and pressure sensors** would have potential applications in bio-organs, industries, and under harsh environments. Up to now, silicon and polymer-based materials have been mostly used as active components in flexible/stretchable devices. However, **1D materials including nanowires (NWs) and nanotubes are expected to be advantageous in future stretchable electronics**, exhibiting enhanced performance and better integration due to their superior electronic properties and structural flexibility.

Stretchable UV sensor arrays of SnO_2 nanowires

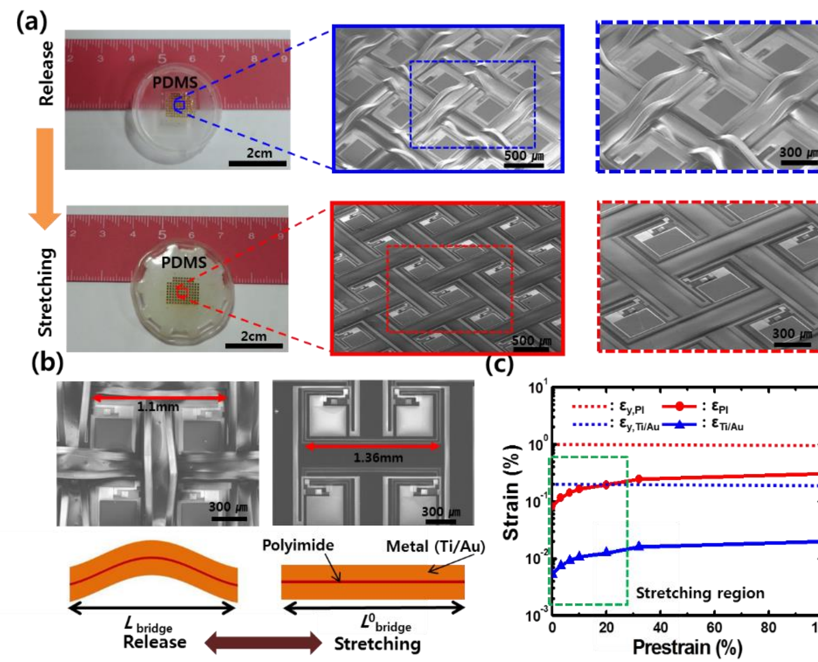




Stretchable UV sensor arrays based on active matrix (AM) device using SWCNT field effect transistors (FETs) and SnO_2 NW FETs together.



UV sensor arrays with average photosensitivity of ~10^5 and external quantum efficiency of ~10^6 under very low UV power intensity of 0.02 - 0.04 $mWcm^{-2}$.



The device performance is not deteriorated when the whole devices are radially stretched up to 20 %.