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Rubbery Electronics - Towards a Seamless Integration with Humans

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Abstract: Seamlessly merging electronics with biology is of imminent importance in addressing grand societal challenges in health and joy of living. However, the main challenge lies in the huge mechanical mismatch between the current form of rigid electronics and the soft curvy nature of biology. In this talk, I will present a new type of electronics, namely "rubbery electronics", with tissue-like softness and stretchability, which is constructed all based on elastic rubbery electronic materials. The hope is that rubbery electronics could ultimately solve the challenge in seamless integration between biology and electronics. The rubbery electronic materials and device innovations set a foundation for rubbery electronics. Fully rubbery transistors, logic gates, integrated electronics, sensors, smart skins, medical implants, and neurologically integrated function systems will be demonstrated.

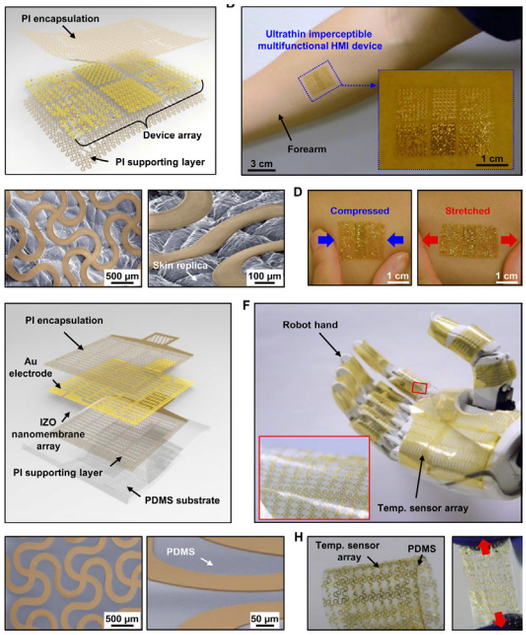
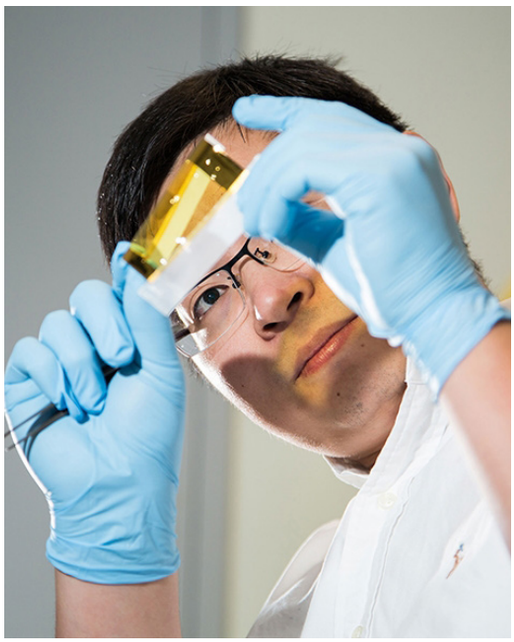


Figure Credit: Metal oxide semiconductor nanomembrane–based soft unnoticeable multifunctional electronics for wearable human-machine interfaces, Science Advances 02 Aug 2019: Vol. 5, no. 8, eaav9653



Bio: Dr. Cunjiang Yu is the Bill D. Cook Associate Professor of Mechanical Engineering at the University of Houston, with joint appointments in Electrical and Computer Engineering, Biomedical Engineering, and Materials Science and Engineering. He completed his Ph.D. in Mechanical Engineering at Arizona State University in 2010 and was trained as a postdoc at the University of Illinois at Urbana-Champaign before joining the University of Houston in 2013. Dr. Yu is a recipient of NSF CAREER Award, ONR Young Investigator Award, MIT Technology Review Top Innovators, SME Outstanding Young Manufacturing Engineer Award, AVS Young Investigator Award, ACS Petroleum Research Fund Doctoral New Investigator Award, and the 3M Non-Tenured Faculty Award.