Tactile sensors and liquid metal particle-based stretchable conductors for wearable and robotic applications

Mechanically deformable sensors and electronics are gaining significant interest in recent years due to their applicability in wearable electronics and robotics. In this lecture, I will firstly discuss our group’s recent work on tactile pressure sensors. Through architectural engineering, the performance of individual sensors can be drastically improved. Also, through structural design, each sensor in a high dense array of pressure sensors can be mechanically decoupled such that it is only responsive to pressure and insensitive to any other mechanical stimulation. Secondly, I will discuss our group’s recent work on ultra-stretchable and mechanically durable liquid metal particle-based conductors. These conductors have very low gauge factors with exceptionable stretchability, and can be patterned at high resolution over a large area via printing and photolithography. These techniques enable sensors that are mechanically stable, soft, and conformable on various surfaces, thus expanding the applicability of sensors towards advanced wearable and robotic applications.