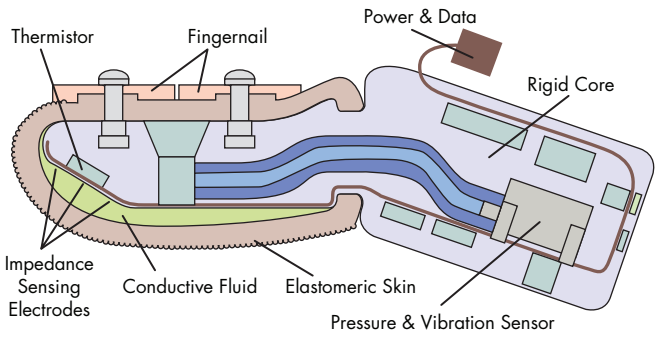
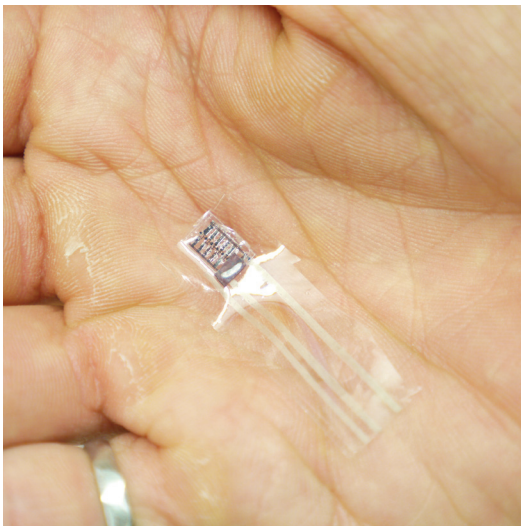
Simulating Human Touch

A NEW TACTILE sensor from SynTouch (www.syntouchllc.com) performs three notable functions. First, the impedance is measured by using a flexible bladder against an array of sensing electrodes in a rigid core. It thus obtains a deformity measurement, much like the human finger uses ductile skin and flesh against a rigid bone. This is where the fingernail is needed—it causes budges in the skin that allow shear forces to be detected.



Second, micro-vibrations are registered by a pressure sensor mounted on the inside of the sensor's core, enabling the measurement of surface roughness and texture. It's at this point where the fingerprints add a lot of value, since they interact with textures.



Third, in the sensor's thermistor, the electrical resistance depends on temperature. The sensor (like a human finger) generates heat, and the thermistor allows the sensor to detect how it's exchanged when it touches something.

By placing all electronics inside a rigid core and covering them with a compliant replaceable bladder, this sensor is able to function more robustly while providing sensitive human-like measurements. Electronics such as this could someday be a normal sight on robotic hands, offering a real human touch that allows a robot to identify material and grip it appropriately. md