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**Liquid-Embedded Elastomer Electronics** REBECCA KRAMER, Harvard University, CARMEL MAJIDI, Carnegie Mellon University, YONG-LAE PARK, JAMIE PAIK, ROBERT WOOD, Harvard University — Hyperelastic sensors are fabricated by embedding a silicone rubber film with microchannels of conductive liquid. In the case of soft tactile sensors, pressing the surface of the elastomer will deform the cross-section of underlying channels and change their electrical resistance. Soft pressure sensors may be employed in a variety of applications. For example, a network of pressure sensors can serve as artificial skin by yielding detailed information about contact pressures. This concept was demonstrated in a hyperelastic keypad, where perpendicular conductive channels form a quasi-planar network within an elastomeric matrix that registers the location, intensity and duration of applied pressure. In a second demonstration, soft curvature sensors were used for joint angle proprioception. Because the sensors are soft and stretchable, they conform to the host without interfering with the natural mechanics of motion. This marked the first use of liquid-embedded elastomer electronics to monitor human or robotic motion. Finally, liquid-embedded elastomers may be implemented as conductors in applications that call for flexible or stretchable circuitry, such as robotic origami.

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