Tactile Sensor for Compliance Detection

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A macroscale tactile sensor using a resistance-type strain gauge is presented to demonstrate the concept of applying two sensors with considerably different stiffnesses to soft tissue for compliance detection. The design procedure for the tactile sensor was carried out. The sensor contains two cantilevers with different stiffnesses. One important advantage of the sensor is that its reading does not depend on the applied displacement between the sensor and the specimens. The measuring range of the sensor is 0–500 N/m, to cover a wide range of soft-tissue stiffnesses. Test specimens with stiffness constants of 60, 117, 174, and 480 N/m were used to test the sensor. The results showed that the sensor could distinguish the difference in stiffness of test samples under various applied loads. Eventually, this sensor is expected to be miniaturized by micro machining for use in medical applications.

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