USF Available Technologies

Technology Transfer Office

Fingertip Force, Location and Orientation Sensor

Researchers at the University of South Florida have developed a novel fingertip force and orientation sensor (FFPO) that will enable roboticists and neuroscientists to characterize human hand locomotion in more detail.

Commercial tactile sensors such as FingerTPS and Tekscan have been successfully embedded on many robotic fingers to provide spatial grasping information for grasp control. However, due to their stiffness, these tactile sensors are not suitable for use in human grasping studies as wearable sensors on the fingertip. Most studies attach the tactile sensors to the force sensors rather than the fingertip. This provides spatial profiles around the contact point on the object, but not the fingertip. However, many scientists are seeking ways to measure the contact position on the fingertip in an attempt to better model and understand more sophisticated grasping behaviors like rolling and re-grasping.

To this end, our researchers have developed a novel integrated system that is composed of a fingerprint sensor and a force sensor to measure the contact position, force and orientation on the fingertip. The system uses the fingerprint from the sensor to identify contact position and orientation on the fingertip. The contact position and orientation are represented in a finger pad coordinate system for grasping studies. The proposed system can be used to characterize finger pad contact.

ADVANTAGES:

- **Measures the contact position and orientation on both the fingertip and object**
- **Measures contact force**
- **Does not sacrifice precision or dimension**

Novel

Finger Contact Sensor

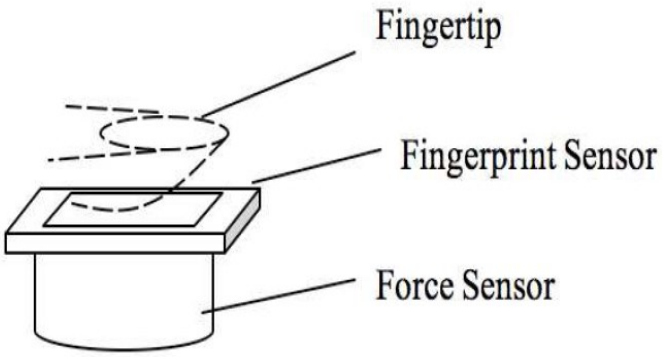

Figure: A schematic drawing of the novel integrated FFPO sensor system that includes a force sensor and a fingerprint sensor

Tech ID #10B112 **Patent #: 8,724,861**

University of South Florida | Technology Transfer Office
813.974.0994 (office) | 813.974.8490 (fax)
patents@research.usf.edu
http://www.usf.edu/research-innovation/pl/