

Pyramid sensors for 3D force detection

State of the art sensitivity arising from tangential force differentiation

Technology

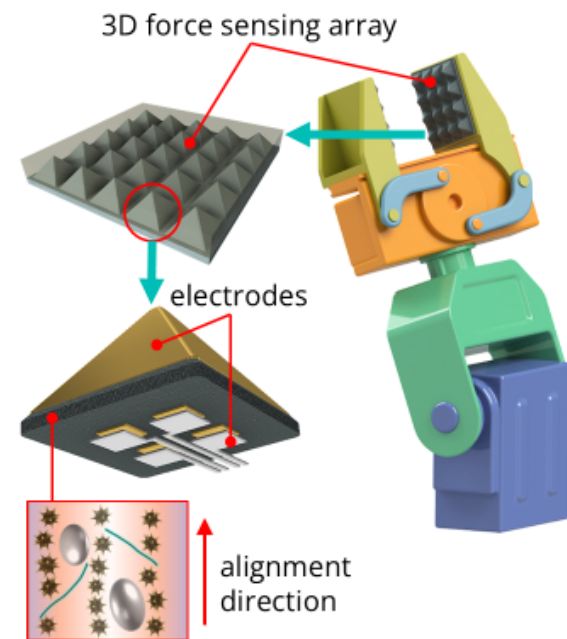
A force sensor capable of detecting and differentiating both normal and tangential forces, which allows robotic handling of fragile components, for example in automated manufacturing.

Benefits

- Flexible and tactile sensors allow state of the art sensitivity (110 kPa^{-1} sensitivity over a 500 kPa range).
- Pyramidal geometry allows the sensor to differentiate between normal and tangential forces, thereby enabling slip detection, a key reliability issue for automated handling systems.
- Made from low-cost, durable composite materials and featuring simple electronics, the pyramidal sensors are economically viable and easy to integrate into existing systems.
- Soft, adaptive material allows delicate and versatile handling, with applied forces monitored continuously for additional reliability.

Commercial applications

- Automated manufacturing: enhances the precision and reliability of automated handling systems.
- Soft robotics: mimics the sensing capabilities of human fingers.
- Healthcare: potential applications in prosthetics for better force feedback and control.



Schematic of an array of pyramidal sensors mounted on the gripping surface of a robotic arm. The sensors detect the magnitude and direction of applied forces, the roughness of the surface of any item picked up and slippage.

Opportunity

This technology is available for co-development and / or licensing.

For further information please contact: Sophie.Jones@enterprise.cam.ac.uk